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New Data Science Degree
Scholarships
Sponsors of Prizes
Welcome to the Final Year Projects exhibition by the graduating B.Sc. and B.Eng. classes of 2017 from the DCU Faculty of Engineering and Computing.

Our details and respective projects can be found within this booklet. The projects demonstrate how we put into practice the knowledge gained during our time here in DCU. They cover many areas within computing, electronic engineering and mechanical and manufacturing engineering and are inspired by time spent on INTRA (work placement), staff research interests, collaboration with companies and original concepts. The projects clearly demonstrate our hard work and innovation.

We would like to extend our thanks to lecturers, supervisors and the support staff for all their help and assistance throughout our time here. Without their support we would not be here today. We would also like to thank the main sponsor of this event, SAP and those companies sponsoring prizes. Through their sponsorship they are showing a belief in the ability of Irish graduates and a commitment to the future of Irish industry.

And last, but not least, we thank you, the visitors and the companies you represent, for showing an interest in our work – we hope you enjoy it!

Faculty of Engineering and Computing
Final year students 2017
On behalf of the Faculty of Engineering and Computing, I would like to welcome you all to this year’s Final Year Projects exhibition by the Class of 2017. This event started as a single School of Computing event three decades ago and has grown from 25 projects back in the late 1980s to 250 exhibitors at the present day.

Today, we have the opportunity to recognise and celebrate the work of these students. We all go through many stages in our careers and lives, and today, for these students, marks an important milestone. Today, they display this major highlight of their academic achievements for their peers, their academic mentors, and for the many guests who join us from industry and the wider DCU community.

At its core, our Faculty’s focus is to release the potential which our students have, to have impact. We believe that the range of Final Year Projects on display here today reflects the great opportunities for these young graduates to contribute to the advancement of Irish society over coming years. Many of the projects displayed represent products with immediate commercial potential; all demonstrate ingenuity, skill and technical capability of the highest calibre.

To the students, congratulations and well done! Some of you will now go on to careers within the engineering, computing or other sectors of the Irish economy; others will continue your formal education either here in DCU or elsewhere; some may travel across the world; and some may choose to develop your careers into new and different directions – management, accounting, consultancy, maybe even politics! But we hope that all of you will look back with fondness at your time here at DCU, and also – and perhaps more importantly – at the friendships you have made here. We here in the Faculty always enjoy hearing how former students are developing in their careers. Do please stay in touch, and come back and visit from time to time – you will always be welcome!

To our guests, thank you for taking the time to join us here today. We hope that you enjoy your visit and are impressed with the depth and breadth of the work that our students are presenting. Impressive though they are, these projects still represent only a small sample of the learning that the students have achieved in the course of their studies. Do please engage with them directly and explore more fully what the DCU education experience represents.

DCU is well-known for its strong relationship with enterprise, innovation and entrepreneurship. We are confident that the students you meet here today will go on to have a strong impact on the various industries and sectors that you represent.

The staff and students of the Faculty look forward to meeting you and sharing these projects with you, and we hope you all enjoy your visit to the Faculty and DCU.

Prof. Lisa Looney
Dean, Faculty of Engineering and Computing
INTRA – The DCU-Industry Work Placement Programme

Relevant work experience through DCU’s INTRA (INtegrated TRAining) programme has been a central feature of education at DCU since the establishment of the university, and is an integral part of all undergraduate degree programmes in the Faculty and Engineering and Computing. Under the INTRA programme, undergraduate students complete a six month work placement during their third year of study, running from April to September inclusive. In many cases, students are subsequently recruited to work with their INTRA employers after they have completed their undergraduate studies.

Why Offer an INTRA Placement?

Every year, employers in Ireland and overseas hire more than 800 students from DCU for an INTRA placement. Ranging in size from the largest multinational, to the sole trader or start up, these employers are convinced of the merits of choosing DCU students and come back to INTRA year after year. INTRA provides the following opportunities for an employer:

- Access to a supply of highly motivated young people who have proven that they can make a real contribution
- An opportunity to evaluate and train possible future employees
- Frees existing staff from time-consuming but routine tasks
- Allows relief or assistance during seasonal peak work loads
- Permits new projects to be undertaken
- Develops existing staff by providing mentoring opportunities
- Raises awareness of your company and products/services on campus
- Provides an ideal opportunity for employers and academics to establish long-term relationships and the potential for working together on projects
- Provides an opportunity for involvement in the development of graduates with the required key skills essential to the Irish economy
- Helps to promote and reinforce a lifelong learning culture within an organisation through the establishment of strong links with a third level institution

For more details, contact Maeve Long, Head of INTRA, phone: +353 (01) 700 5515, email: maeve.long@dcu.ie
DCU’s Careers Service offers a comprehensive employment service for companies wishing to recruit graduates from our Engineering and Computing programmes as well as providing a crucial link to students from a range of other disciplines including Business, Humanities, Science and Education.

As an employer, you have the opportunity to reach excellent DCU students and graduates through availing of the following:

- Advertising vacancies online, which are seen by up to 1,000 students and graduates per week. Check out: www.dcu.ie/careers
- Participating in an annual Employer Recruitment Fair, which allows companies to meet up to 2,000 talented DCU students and graduates in October every year as well as students from a range of other Irish Universities and Third Level Colleges
- Visiting Employer Programme: To recruit competent, highly-educated DCU students and graduates from relevant courses, you may wish to make presentations on campus or even conduct interviews here. The Careers Service runs a Visiting Employers Program and provides opportunities for companies to come on campus and advertise their vacancies and meet plenty of enthusiastic DCU students
- Opportunity to advertise your vacancies to a range of DCU Alumni in conjunction with DCU Careers Service and DCU Alumni
- Raise your company profile on campus: DCU Careers Service can email company information on vacancies of relevance to DCU students and graduates directly into the mail accounts of the appropriate students

To learn more about how DCU Careers Service can assist you in recruiting high calibre graduates, visit www.dcu.ie/careers or contact Ger Lardner, Careers Advisor, email: ger.lardner@dcu.ie.

Collaboration on Undergraduate Projects

An interesting way in which companies can raise their profile among graduating students is by putting forward projects which students can work on as part of their course. Companies are also invited to provide in-house support for projects undertaken by students, or to provide financial support for projects assigned to students. There are several benefits to the company, not least of which is the opportunity to get valuable research undertaken that might not be possible within the company due to operational commitments.

If you are interested in finding out more about possible collaboration with students in our Schools here are the contact details:

School of Computing
phone: +353 [01] 700 8980
email: computing.info@dcu.ie

School of Electronic Engineering
phone: +353 [01] 700 5131
email: ee.info@dcu.ie

School of Mechanical and Manufacturing Engineering
phone: +353 [01] 700 5104
email: mme.info@dcu.ie
The School of Computing

The School of Computing at Dublin City University has earned a strong reputation for excellence in research and teaching. In addition to its existing programmes the B.Sc. in Computer Applications degree and the B.Sc. in Enterprise Computing. The new and innovative B.Sc. in Data Science datascience.dcu.ie is the first of its kind in Ireland, and is aimed at students who are interested in a career in Big Data, data analytics and related data science roles. We also offer a range of innovative taught programmes aimed at producing graduates with the professional and personal skills most sought after in the Information Economy.

The School also enjoys a lively, supportive environment for research in many areas of computing, with its numerous Ph.D. and M.Sc. research students producing work of significance at both national and international level. With close industry links and fee support for EU students, the School’s teaching and research programmes reflect the current and anticipated needs of Ireland’s industrial and commercial sectors while at the same time meeting the most rigorous national and international academic standards.

The range of undergraduate programmes offered by the School of Computing are:

- B.Sc. in Data Science (new in 2017/18) for more information see page 116
- B.Sc. in Enterprise Computing
- B.Sc. in Computer Applications

The range of postgraduate programmes offered by the School of Computing are:

- Graduate Diploma in Information Technology (GDF)
- M.Sc. in Computing [Data Analytics]
- M.Sc. in Computing [Security and Forensic Computing]
- M.Sc. in Computing [Cloud Computing]
- M.Sc. in Computing [Software Engineering]
- M.Sc. in Electronic Commerce

For more information on our programmes contact marketing@computing.dcu.ie
The School of Electronic Engineering

Student Knowledge and Aptitudes

The objective of our taught BEng/MEng programmes in Electronic Engineering is to produce qualified engineering professionals who will:

- Have a sufficient understanding of basic sciences and mathematics appropriate to developing their careers as professional engineers
- Be competent in electronic circuits, systems and software design
- Have a detailed knowledge of the most important sub-disciplines related to their programme of study
- Have a capacity to model and analyse the dynamics of a range of technological systems
- Understand the overall requirements of product design
- Understand the structure and organisation of industry and have relevant industrial experience as a support to attaining the previous objectives
- Be capable of approaching problem-solving in a creative and innovative way
- Have developed a range of communication skills – oral, written and visual
- Have sufficient personal and inter-personal skills to enable them to be effective contributors to technology-based industrial development
- Be critically aware of the impact of engineering on society
- Embody the professional qualities of discipline, discrimination and application
- Be aware of the need to update or deepen their knowledge and skills and have an ability to do so through research, academic or professional training

Work Areas

Students from our taught BEng/MEng Engineering programmes have the ability to work in a range of different engineering areas, some of which are listed below.

BEng in Electronic and Computer Engineering

- New programme with first graduates in 2017
- Majors offered in Systems and Devices, High-Speed Communications, Digital Interaction, and the Internet of Things (IoT)
- Building on successes of previously offered BEng programmes in Electronic Engineering, Information and Communications Engineering, Digital Media Engineering
- Hardware design and development of embedded systems
- Development of optical communications systems
- Semiconductor and nanoelectronic materials and device manufacturing
- ASIC design/testing
- Building real-time distributed system infrastructure and applications software
- Development of computer and machine vision solutions
- Analysis, development, refinement and optimisation of DSP algorithms
- Network design and operation for public telecom operators
Private network design and operation for utility companies, government organisations and/or financial services applications

Technical marketing, including network design

Telecommunications research organisations and consultancies

Telecommunications software development

Systems development for diverse database-backed web services

Hardware design of digital media devices (incl. mobile phones, tablets, mobile robotics)

Development of virtual reality, telepresence and visualisation applications

Web applications and interfaces for delivery of content to diverse environments

Systems architecture design for e-commerce/B2B applications

Developing archival or browsing systems for libraries of multimedia content

BEng in Mechatronic Engineering (jointly in collaboration with the School of Mechanical and Manufacturing Engineering)

An understanding of the principles of fundamental sciences, engineering sciences, technology and mathematics.

An understanding that a few powerful unifying principles govern the function of many different mechatronic systems.

A thorough knowledge of modelling and design, system integration, actuators and sensors, intelligent systems, robotics, computer integrated manufacturing and automation, motion control and image processing.

A capacity to take a problem and redefine it in an engineering context; in the course of designing a system, component or process to meet specified needs.

Proficiency in the design and running of experiments and the analysis and interpretation of data.

A knowledge of the resources required to put in place a solution to an engineering problem taking into account the practical constraints from a technical, human resources and financial perspective.

The capability of efficient project management maximising use of available resources to produce a successful outcome in a pre-defined time frame.

An ability to demonstrate professional conduct in diverse, complex and unfamiliar situations at all times being aware of the implications of their work.

An understanding of the need for high ethical standards in the practice of engineering, including the responsibilities of the engineering profession towards people and the environment.

An understanding that sustainability, recycling and product life cycle must be considered at the design stage.

An ability to work as part of a multidisciplinary team using their hybrid mechatronic training to integrate technologies in a synergistic manner.

An awareness of the need to update or deepen their knowledge/skill set and an ability to conduct further training through research, academic or professional training.
An ability to independently acquire further expertise and to ensure that the use of this expertise complies with the ethical standards of the profession.

An understanding of the importance of the engineer’s role in society and the need to communicate effectively within this environment and to other engineers.

An ability to embrace all modern media for the purposes of communication, with a strong emphasis on visual computer aided design methods.

An understanding of the need for the highest ethical standards of practice.

An understanding that, as part of a team, it is important to consider the opinions of other members and to put in place a plan/design/process that is cognisant of these opinions.

Full details of the DCU INTRA programme are available at: www.dcu.ie/intra.

Taught MEng in Electronic Systems

Option to take a Major in Nanotechnology, Image Processing and Analysis and Internet of Things.

Taught MEng in Telecommunications Engineering

Option to take a Major in Network Implementation

Opportunities in Irish and International high-tech industries, including:

- Research and Development Engineer
- Design Engineering
- Production Engineering
- Engineering Sales
- Engineering Management
- Software Engineering

Taught MEng in Digital Health and Medical Technologies

- 3U Joint Programme with Maynooth University and Royal College of Surgeons in Ireland
- Graduates can expect to work both inside and outside the health services
- Software and engineering of healthcare focussed services and systems
- Technology-based products for use in a medical/clinical environment.
Student Knowledge and Aptitudes

The objective of our taught BEng/MEng programmes in Mechanical and Manufacturing Engineering disciplines is to produce qualified engineering professionals who will:

- Have a sufficient understanding of basic sciences and mathematics appropriate to developing their careers as professional engineers
- Be competent in design, professional development, dynamics and control, solid mechanics, fluid mechanics, materials and manufacturing, sustainable manufacturing systems, biomedical engineering and business
- Have a detailed knowledge of the most important sub-disciplines related to their programme of study
- Have a capacity to model and analyse the dynamics of a range of technological systems
- Understand the overall requirements of product design
- Understand the structure and organisation of industry and have relevant industrial experience as a support to attaining the previous objectives
- Be capable of approaching problem-solving in a creative and innovative way
- Have developed a range of communication skills – oral, written and visual
- Have sufficient personal and inter-personal skills to enable them to be effective contributors to technology-based industrial development
- Be critically aware of the impact of engineering on society
- Embody the professional qualities of discipline, discrimination and application
- Be aware of the need to update or deepen their knowledge and skills and have an ability to do so through research, academic or professional training

Work Areas

Students from our taught BEng/MEng Engineering programmes have the ability to work in a range of different engineering areas, some of which are listed below.

BEng/MEng in Mechanical and Manufacturing Engineering

- Design of engineering materials, processes and components, and related developing technologies
- Create models (CAD or otherwise), deriving appropriate equations and specifying boundary conditions and underlying assumptions and limitations.
- Use of appropriate mathematical methods for application to new and ill-defined mechanical and manufacturing engineering problems
- Investigate the performance of systems and components through the use of analytical methods and modelling techniques, and develop software tools including numerical techniques to solve engineering problems
- Product design and development of mechanical systems
- Sustainability of manufacturing processes
- Project management skills
BEng/MEng in Biomedical Engineering

- Modelling and design, production technology, biomaterial science and the requirements for regulatory compliance
- Understanding of Anatomy and physiology, and biomechanics, image processing, sensors, statistics, and the requirements for regulatory compliance
- Evaluation of the latest technology in the Bio Engineering field of interest and use of the appropriate technologies where desired
- Development of computer-based design to mimic bio engineering problems
- Application of ethical standards and duty-of-care towards the end-users of biomedical products

B.Sc. in Manufacturing Engineering with Business Studies

- Design, manufacturing and marketing of engineering products
- Management of manufacturing processes and systems coupled with the awareness of business opportunities.
- Synergistic approach to solving engineering challenges (designing, manufacturing, engineering products and managing manufacturing processes)
- Application of appropriate business skills (marketing, plant operation, project management and business management) within the broad discipline of manufacturing engineering.

BEng in Mechatronic Engineering (jointly in collaboration with the School of Electronic Engineering [see page 7]).
Message from Our Sponsor

SAP are delighted to once again be here to celebrate the final steps of your undergraduate journey. I would like to congratulate you for your significant achievement and wish you well on the next phase of your career.

As graduates, you are entering the industry at a very exciting time. Software is embedded in every part of our lives. Cloud and in-memory computing have been game changers allowing companies to leverage innovative technologies and real-time data. At SAP we recognise the importance of these new technologies and are striving to offer our customers a way to harness the benefits for the digital world of today. We help our customers to Run Simple backed by the strong track record of our software and support.

This operating principle is the cornerstone for our workforce of over 84,000 people worldwide, we are focused on helping the world to run better. I hope that wherever your career takes you that you will push businesses to innovate – to do things simpler, faster, smarter, and more sustainably, in ways that will ultimately change the world.

I’d like to take this opportunity to highlight the SAP Ireland Cooperative Program which was launched in 2015 with DCU as a central partner. This extended professional internship offers select students work with SAP for 2 years in conjunction with their academic studies. This program complements their academic studies and allows them to apply their knowledge in real world situations. I am pleased that 10 DCU students from the first batch of this program are amongst you today, many of them will soon graduate and take up positions with us in the coming months. The second batch of students are half way through the program, making outstanding contributions to the teams they are working in, both here and in Germany, while the third batch will start with us soon.

A final note of congratulations on this special day and I wish you every success in the future.

Liam Ryan
MD SAP Ireland
Fast Facts
The SAP Family

Our Story
SAP’s five co-founders created a company that places no ceiling on its goals for the future. They built a market leader with unique capabilities to help the world run better and improve people’s lives. It is a rich company that offers a vast amount of opportunity and growth to be the MOST innovative Cloud Company, Powered By SAP HANA.

Employees By Region

SAP has more than 82,400 employees from 154 nations!

Who We Are

24% Women Leadership
Of all the leadership positions at SAP, 24% are held by women

43% Millennials
At SAP, Millennials make up 43% of our employee base

15% Virtual
At SAP, more than 15% of our employees work from home as virtual employees

Reasons To Believe

98%
We serve 98 of the top 100 most valued brands in the world

22,296 SAP employees spent 141,595 hours on 939 social projects

150+ “Best Employer” Awards in 2016 alone

SAP offers opportunity to volunteer, serve as a mentor, help social enterprises scale and build a skilled workforce for IT

SAP values diversity & inclusion and true authenticity, every employee is empowered and encouraged to be who they are

SAP cares about your health and happiness and offers a great work-life balance and some of the best employee benefits in the industry

Endless Opportunities

Sales, Marketing, & Finance
Software & Design
Data Science & Machine Learning
Research & Development

Become Part Of The SAP Team
Visit us at: sap.com/careers
BRING EVERYTHING YOU ARE.
BECOME EVERYTHING YOU WANT.

Find yourself working at SAP.
sap.com/careers
Project Numbers

**Computer Applications:** 1 10 101 102 105 106 108 111 112 114 116 117 118 12 122 124 125 127 128 13 133 140 145 148 15 153 156 157 159 161 162 164 165 170 173 175 176 178 181 183 184 186 188 189 19 191 192 195 196 199 203 205 206 207 21 210 212 213 214 22 220 221 224 225 23 234 235 236 237 27 28 3 30 32 33 35 37 39 42 45 47 49 53 55 56 59 60 62 64 65 66 68 7 75 78 79 8 81 83 87 90 91 96 98

**Enterprise Computing:** 144 152 160 17 179 18 187 201 204 227 231 239 240 242 41 43 44 46 52 61 63 70 76

**Computational Problem Solving and Software Development:** 51 57 71

**Electronic Engineering:** 109 228

**Electronic and Computer Engineering:** 113 123 129 137 146 177 185 215 217 218 219 229 233 238 25 38 48 85 86 93 94

**Information and Communications Engineering:** 50

**Mechatronic Engineering:** 115 121 126 130 132 136 139 141 147 163 182 197 200 202 208 209 230 241 54 67 72 82 97

**Mechanical and Manufacturing Engineering:** 103 107 110 131 135 138 142 143 150 151 154 155 158 16 167 169 174 190 2 20 211 223 24 243 31 6 84 89 9 95 99

**Biomedical Engineering:** 11 119 120 134 166 171 172 180 194 232 29 36 4 40 58 74 80 88 92

**Manufacturing Engineering with Business:** 100 104 14 149 168 193 198 216 222 226 26 34 69 73 77

Project Areas

These pages are a rough guide to the Engineering Areas and Technologies the project focused on. Full details can be found in this booklet under each project summary.

**3-D Modelling:** 103 112 199 205 69 89 92

**Additive Manufacturing:** 104 120

**Advanced Material Engineering:** 138 158 171

**Android:** 13 15 152 179 18 181 183 184 195 201 22 220 241 32 33 45 49 59 63 66 70 8 81 85 87 91

**Arduino:** 129 130 147 197 209 97

**Artificial Intelligence:** 1 117 12 156 224 225 42 56 60

**Automation:** 176 182 190 216 218 61

**Automotive Technology:** 131 94

**Biomedical Engineering:** 110 119 134 149 166 172 194 4 40 74 77 80

**Circuit Modeling:** 238 48

**Cloud Computing:** 75

**Control Systems:** 163 54

**Computer Vision:** 132 235

**Cryptography:** 113 165 38

**Embedded Systems:** 67

**Energy Conservation:** 174 208 6 93 95

**Databases:** 124 175 23

**Data Analytics:** 102 111 127 189 3 65 83

**Data Mining:** 106

**Device Design:** 11 142 2 215 24 31 82 88 99

**Distributed Systems:** 7

**Educational:** 198 204 237 5 62 64

**Fluid Mechanics:** 143 211 84

**Gaming:** 118 140 170 186 196 221 28 71 96
Project Areas (continued)

GPS GIS: 157 37
Graphics: 78 98
Information Retrieval: 191 236
Internet of Things: 185 219
Image Video Processing: 123 137 173 178
Lean Manufacturing: 16 193 20 202 222 223 73
Mechanical Design and Manufacture: 107 135 154 167 169 243 26 9
Mechatronic Systems: 121 141 200
Mobile App: 122 133 144 161 213 214 231 239 240 25 43 47 53 68 76
Model View Controller: 19 90
Motion Analysis: 207
Natural Language Processing: 108 212
Optical Character Recognition: 128
Optical Communications: 86
Power Electronics: 139
RaspberryPi: 126
Robotics: 115 230 72
Security: 187
Sensor Data: 136 164 30
Sensor Technology: 109 34 39
Simulation: 101
Software Development: 148 162 57
Social Networking: 168
Statistical Analysis: 29
Telecommunications: 177 233 50
Virtual Reality: 116
Water Treatment: 155
Web Application: 10 105 114 125 145 159 160 17 188 192 203 21 227 234 242 41 44 46 52 55 79

Project Technologies

.NET: 135 176 65
AngularJS: 111 145 164 175 192 199 205 207 21 42 44
C/C++: 101 117 118 121 130 137 185 197 200 209 33 37 59 71 72 94
C#: 1 112 116 12 132 140 156 170 186 210 221 224 237 28 62 67 96
CSS: 126 159 179 18 187 203 227 231 41 49 55 90
Docker: 35 7 91
Eclipse: 115 29 30 83 98
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<th>Name(s)</th>
<th>Project Title</th>
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<td>1</td>
<td>Jingyun Xu</td>
<td>Virtual society</td>
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<tr>
<td>2</td>
<td>Pádraig Wall</td>
<td>Design and evaluation of a testing unit to measure sealing pressure of fasteners joints project</td>
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<td>3</td>
<td>Sean Quinn</td>
<td>Predictive Analytics Toolkit</td>
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<td>4</td>
<td>Aaron Farrelly</td>
<td>Bioreorbable Calcium Phosphate Cements</td>
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<td>5</td>
<td>Thomas Feeney</td>
<td>Vocaby Builder</td>
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<td>6</td>
<td>Joshua Woods</td>
<td>A study of solar panel efficiency in Ireland</td>
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<tr>
<td>7</td>
<td>Cian Butler</td>
<td>Containerised microservice backend for CoderDojo</td>
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<td>8</td>
<td>James Nathaniel De Ocampo</td>
<td>Image recognition for vegetables</td>
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<td>John Walls</td>
<td>Analysis and Optimisation of Vibration Bowls in Xerox DCTP</td>
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<td>10</td>
<td>Conor Reddin</td>
<td>Physics Room</td>
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<td>11</td>
<td>Niall Connolly</td>
<td>Design of a device for minimally invasive delivery of cartilage repair therapies</td>
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<td>12</td>
<td>Edward Moriarty</td>
<td>Neural Sprint</td>
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<tr>
<td>13</td>
<td>Eanna Byrne</td>
<td>Receipt Management Application and Hardware</td>
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<td>14</td>
<td>Evan Doherty</td>
<td>Modelling and Analysis of Closed Loop Supply Chain Management for Reusable Articles</td>
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<td>15</td>
<td>Jose Mulowayi</td>
<td>Appointments Manager</td>
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<td>16</td>
<td>Fearghal O’Hare</td>
<td>Development of a Lean/Six Sigma toolbox for water conservation in manufacturing processes</td>
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<td>Mark Gerrity James Burke</td>
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<td>John Garrahan Seán Cahill</td>
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<td>George McNally</td>
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<td>Saif Alasmi</td>
<td>Analysis of the Toyota Production System</td>
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<td>Artur Vorobjov</td>
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<td>Eoin McKenna</td>
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<td>Method of Data Integration</td>
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<td>Diarmuid Sheridan</td>
<td>Turf torque tester</td>
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<td>David Gallagher</td>
<td>Smartphone-based Indoor Positioning System</td>
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<td>The Design and Manufacture of a System To Positively Control a Trailer’s Steering</td>
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<td>29</td>
<td>Cian O’Hagan</td>
<td>Computational simulation and analysis of statistical Six Sigma production techniques</td>
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<td>Liam Finn</td>
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<td>Victor Adeboye Akinla</td>
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<td>Shane O’Neill</td>
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<td>Matthew Agnew</td>
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<td>Jacob O’Keeffe</td>
<td>Serverless Microservices PaaS</td>
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<td>36</td>
<td>James Kelly</td>
<td>The Incorporation of Biocompatible Dyes into Biomaterials</td>
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<td>Aaron Steed</td>
<td>Project Whurl: Performance Analysis and Real-time Injury Awareness for Hurling</td>
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<td>Philip Clarke</td>
<td>FPGA implementation and performance analysis of block cipher PRINCE</td>
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<td>Karl Gillespie</td>
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<td>Investigation of braided fibre structures for applications as ligaments or tendon replacements</td>
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<td>Neil Saccardo</td>
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<td>Stephanie Bellew</td>
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<td>Wireless Android keyboard and mouse</td>
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<td>Altruism in Simple Societies</td>
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<td>Egidijus Zutautas</td>
<td>eTasker app for business – flexible and effective tool for managing tasks, processes and employees</td>
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<td>Aoife Gaffney</td>
<td>Analysis of Six Sigma Tools and Techniques</td>
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<td>J.P. Casserly, Sam Benville</td>
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<td>Design of a Haptic Feedback Device for Flight Condition and Situational Awareness</td>
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<td>Impact of a Bottleneck on the Performance of a Lean Manufacturing System</td>
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<td>Peel Characteristics of medical tapes and adhesives</td>
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<td>Low Modulus PMMA Based Bone Cement for Osteoporotic Bone</td>
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<td>Self-driving robot using image recognition</td>
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<td>Activity Recognition on smartphones using sensor fusion</td>
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<td>Sean Moran</td>
<td>Investigation of high speed radio over fibre distribution systems for future high speed 5G networks</td>
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<td>Cian McGuinness</td>
<td>Find Your Doppelgänger</td>
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<td>Conjugate Electrospinning of Biomaterials</td>
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<td>Water hammer and cistern noise</td>
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<td>Ruairí Barrett</td>
<td>Rapid prototyping and validation of next generation wearable sensors for personal health monitoring</td>
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<td>Steven Smith</td>
<td>Smart meter energy usage statistics</td>
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<td>Lukasz Markowski</td>
<td>Advanced Human Interface Devices (HID) for Flight Simulation Applications</td>
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<td>Matthew Nulty</td>
<td>Energy Efficiency for Cleanrooms: Modelling Energy Requirements</td>
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<td>Robert McGrane</td>
<td>It’s Dangerous To Go Alone!</td>
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<td>Sean Dunniece</td>
<td>Isothermal Temperature Control for use with a Squeeze Film Rheometer</td>
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<td>External Door Closing Design System</td>
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<td>Pre-treatment of fruit waste towards the production of bio methane</td>
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<td>David James Gahan</td>
<td>Statistical Approach to Automatic Video Captioning</td>
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<td>Shane Little</td>
<td>Validating Finite Element Models using Photoelasticity</td>
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<td>Laser Surface Smoothing of 3D Printed Metal Components</td>
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<td>James O’Hara</td>
<td>GTT [Project Management Web Application]</td>
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<td>Gareth Neacy</td>
<td>Dashboard for Optimising Data Mining Algorithms</td>
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<td>Leslee Augustine</td>
<td>Re-design a test rig for the study of an innovative heat engine</td>
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<td>– Fluid Flow Study</td>
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<td>Path Planning Sensors</td>
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<td>Ultrasound assisted extrusion of polymers and biomaterials</td>
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<td>Anomaly Detection Dashboard</td>
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<td>Breathless – A Study of Tension Factors in a 3D First Person Horror Game</td>
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<td>Development of Various Implementations of the Simon Block Ciphers</td>
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<td>Heads-Up No-Limit Texas Hold’em Poker Agent</td>
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<td>Kenneth Dean</td>
<td>A Wireless Minibot Network for Coordinated Movement and Positioning</td>
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<td>V-Chess</td>
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<td>Daire O’Bruchachil</td>
<td>Real-time Networked Game Engine</td>
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<td>The Development of a Hydrogel Heart Valve for Tissue Engineering</td>
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<td>Ahmed Hassan</td>
<td>Easy Interface CD player for seniors</td>
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<td>Kevin Gillanders</td>
<td>An investigation into the factors affecting Reddit post popularity</td>
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<td>Adam Purser</td>
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<td>A Wireless Intruder System</td>
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<td>Amir Al Ghafri</td>
<td>Low-Cost 3-Axis Camera Motion Stabiliser</td>
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<td>Micheál Roddy</td>
<td>Modelling and Simulation of the MAHA Suspension Test</td>
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<td>Matthieu Briet</td>
<td>Computer Screen Navigation using Eye Movements</td>
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<td>Parametric Finite Element Modelling of Hip Prosthesis</td>
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<td>Design and Manufacturing of a Simple Hydroforming Rig to Manufacture Aircraft Structural Components</td>
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<td>Design, Manufacture, and Testing of a Continuous Water Jet for Dissection Based Surgical Procedures</td>
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<td>Chris Holmes</td>
<td>Real-time Video Stabilisation using the PYNQ ARM/FPGA Platform</td>
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<td>Diarmuid Kelleher</td>
<td>A desktop CNC milling machine for demonstration and open day purposes</td>
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<td>Sultan Mohammed Said Al Maawali</td>
<td>Design and build a test rig for the study of a reciprocating pump – Project I design of linear motion system</td>
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<td>Ross Cullen</td>
<td>Piping Systems Dead Leg Analysis</td>
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<td>Stuart McCluskey, Luke O’Riordan, Michael Omodele</td>
<td>Lucky Hour</td>
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<td>Raphaelle Smyth</td>
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<td>Aidan Smyth</td>
<td>An Investigation of Off-Chip and On-Chip Sensor Fusion Solutions for Position and Orientation Estimation</td>
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<td>Kevin Harrington</td>
<td>Development and testing of a true random number generator</td>
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<td>Development of a Composite Hydrogel with Improved Radiopacity for the Treatment of Cerebral Aneurysms</td>
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<td>Shane Patton</td>
<td>Modelling of Bolted Joints Using Finite Element Analysis</td>
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<td>Johnathan McGuigan</td>
<td>Mixing fruit waste to enhance the quality of the bio-gas</td>
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<td>Aimée McDonnell, Adam Ennis</td>
<td>Cloakroom</td>
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<td>Demonstration rig for cylindrical turning</td>
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<td>Sean Conway</td>
<td>Testing and Optimisation of a Water Treatment System – Reverse Osmosis</td>
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<td>Junction Simulation Tool</td>
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<td>My Guide Dogs Dane</td>
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<td>Donal Kilcullen</td>
<td>Aluminium Surface Texturing for Improved Interference Fit Control</td>
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<td>Gymnatic – Train With Intelligence</td>
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<td>Mitchell Ewulonu</td>
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<td>Bryan Goodson</td>
<td>Development of an Improved Drive System for the Greenpower Challenge</td>
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<td>Jamie Goodhart</td>
<td>Marketing, Sponsorship and Web-Site Development for the Siemens Greenpower Car Challenge</td>
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<td>Colm Kelly</td>
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<td>Patrick Mulvaney</td>
<td>VR Puzzle Game</td>
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<td>Helmi Hammad</td>
<td>Development of Scaffolds for Tissue Engineering Applications with Optimised Porosity and Mechanical Properties</td>
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<td>Austin Fanning</td>
<td>Manufacture of an Artificial Hand using Fibre-Reinforced Actuators</td>
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<td>Jordan Healy</td>
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<td>Karl Devereux</td>
<td>Testing and optimisation of a water treatment system (membrane distillation)</td>
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<td>Owen Lennon</td>
<td>Machine Translation Portal</td>
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<td>Design a THz Transmission line</td>
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<td>Éoin O’Friel</td>
<td>Home Monitoring Fall Detection and phone alerts</td>
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<td>Saul Carolan</td>
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<td>The design of collagen coatings for drug and growth factor delivery</td>
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<td>Eoin Ffrench</td>
<td>Lesson creation tool</td>
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<td>Edward Byrne</td>
<td>Prototype Electronic Drum Tester</td>
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<td>Conor Moran</td>
<td>App Of All Trades</td>
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<td>Brian Bonfil</td>
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<td>Ciaran McNally</td>
<td>Building an IoT Automated Triage System using NodeMCU</td>
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<td>Rupak Thapa</td>
<td>Intro to programming gaming</td>
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<td>Emma Gannon</td>
<td>Natural Language Learner</td>
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<td>Ellie Goggin</td>
<td>Analysis and Scoring of the Top 100 Irish Social Media Influencers</td>
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<td>Dylan Cunningham</td>
<td>Parametric Finite Element Modelling of Stress Concentrators</td>
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School of Computing – Ground Floor Layout

LG.27
PROJ NUMS 69-87

LG.26
PROJECT NUMBERS 35-68

LG.25
PROJECT NUMBERS 1-34

Toilets

To 1st Floor Projects

School of Computing – 1st Floor Layout

L1.28
PROJECT NUMBERS 88-121

L1.25
PROJECT NUMBERS 122-166

School Office

L1.14
PROJECT NUMBERS 167-204

Faculty Office

L1.01
PROJECT NUMBERS 205-243

MENS

OFFICES

LADIES

OFFICES

ENTRY/EXIT FROM MAIN FOYER

EXIT
LAB LG.25 – Project Numbers and Locations

1. LG25-01
2. LG25-02
3. LG25-03
4. LG25-04
5. LG25-05
6. LG25-06
7. LG25-07
8. LG25-08
9. LG25-09
10. LG25-10
11. LG25-11
12. LG25-12
13. LG25-13
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27. LG25-27
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31. LG25-31
32. LG25-32
33. LG25-33
34. LG25-34

ENTRANCE

Faculty of Engineering and Computing
Final Year Projects Expo 2017
LAB LG.26 – Project Numbers and Locations

35 36 37 38 39 40 41
LG26-01 LG26-02 LG26-04 LG26-05 LG26-06 LG26-07 LG26-09

ENTRANCE

46 45 44 43 42
LG26-17 LG26-16 LG26-15 LG26-13 LG26-11 LG26-10

47 48 49 50 51
LG26-18 LG26-20 LG26-21 LG26-23 LG26-25

56 55 54 53 52
LG26-33 LG26-31 LG26-30 LG26-28 LG26-26

57 58 59 60 61
LG26-34 LG26-36 LG26-37 LG26-39 LG26-41

ENTRANCE

68 67 66 65 64 63 62
LAB LG.27 – Project Numbers and Locations

69  70  71  72  73

78  77  76  75  74

79  80  81  82  83
LG27-12 LG27-11 LG27-10 LG27-09 LG27-08 LG27-07

87  86  85  84  
LG27-01 LG27-02 LG27-03 LG27-04 LG27-05 LG27-06

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Entrance: L125-01
Project Number: 1

Project Title: Virtual society
Name: Jingyun Xu
Email: jingyun.xu5@mail.dcu.ie
Programme: Computer Applications
Supervisor: Alistair.Sutherland@dcu.ie

Virtual society is an application that could simulate virtual humans to solve tasks with different behaviours in a virtual environment. Different humans in groups with different personalities will make different decisions in a same event. Some are cooperative and others are aggressive. This project is about to simulate humans which have different strategy try to get higher rewards in a society, then find out which strategy will works out best in long term.

Project Area: Artificial Intelligence
Project Technology: C#, SQLite

Project Number: 2

Project Title: Design and evaluation of a testing unit to measure sealing pressure of fasteners joints project
Name: Pádraig Wall
Email: padraig.wall5@mail.dcu.ie
Programme: Mechanical and Manufacturing Engineering
Supervisor: Dermot.Brabazon@dcu.ie

This project was to design and oversee the manufacturing of a pressure vessel which was used to test Penn Engineering insert products. The vessel design was also constructed in such a way that different parts can be tested using it in the future by replacing one piece of the unit. The pressure system is nitrogen-based, and can be tested up to a ceiling pressure of 160 bar.

Project Area: Device Design, Fluid Mechanics, Mechanical Design and Manufacture
Project Technology: Excel/VB, Solidworks

Project Number: 3

Project Title: Predictive Analytics Toolkit
Name: Sean Quinn
Email: sean.quinn34@mail.dcu.ie
Programme: Computer Applications
Supervisor: Mark.Roantree@dcu.ie

This application allows the user to upload csv format datasets and then configure and run several different types of predictive algorithms simultaneously on the data through a browser-based graphical user interface. This allows contrasting the performance of the different algorithms and various configurations of their run parameters for any given dataset, principle component analysis and investigation of the nature of the data. The application features the K-Nearest Neighbours, Decision Tree, Naïve Bayes and Rocchio classification algorithms.

Project Area: Data Analytics, Data Mining, Statistical Analysis, Web Application
Project Technology: HTML5, Java, JavaScript, JQuery, REST, SpringMVC
# Project Number: 4

<table>
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<tr>
<th>Project Title:</th>
<th>Bioresorbable Calcium Phosphate Cements</th>
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<tr>
<td>Name:</td>
<td>Aaron Farrelly</td>
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<tr>
<td>Email:</td>
<td><a href="mailto:aaron.farrelly64@mail.dcu.ie">aaron.farrelly64@mail.dcu.ie</a></td>
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<tr>
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<td><a href="mailto:Nicholas.Dunne@dcu.ie">Nicholas.Dunne@dcu.ie</a></td>
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</table>

This project investigates the mechanical properties and resorption rate of bioresorbable calcium phosphate cements (CPC). CPCs are currently being developed for treating of ‘burst fractures’ of the spine which are caused by sudden impact trauma, such as falling off a ladder or in a car crash. The aims of the project were to produce CPCs, determine the compressive properties, initial and final setting times and to develop a method of monitoring the resorption rate, the key parameters involved with CPCs.

<table>
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<tr>
<th>Project Area:</th>
<th>Biomedical Engineering</th>
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<td>Project Technology:</td>
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# Project Number: 5

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<tr>
<td>Name:</td>
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<tr>
<td>Email:</td>
<td><a href="mailto:thomas.feeney3@mail.dcu.ie">thomas.feeney3@mail.dcu.ie</a></td>
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<tr>
<td>Programme:</td>
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</tr>
<tr>
<td>Supervisor:</td>
<td><a href="mailto:Qun.Liu@dcu.ie">Qun.Liu@dcu.ie</a></td>
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This project attempts to provide a novel way in which users can keep track of, and learn, new English words. The application consists of both a Chrome extension and an Android app. When new words are encountered online, the definition of the word, as well as other information, can be viewed and then optionally added to a database. The user can then use the Android application to view and test themselves in different ways on the words previously encountered.

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<tr>
<td>Project Technology:</td>
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# Project Number: 6

<table>
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<th>A study of solar panel efficiency in Ireland</th>
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<tr>
<td>Name:</td>
<td>Joshua Woods</td>
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<tr>
<td>Email:</td>
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<td>Programme:</td>
<td>Mechanical and Manufacturing Engineering</td>
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<tr>
<td>Supervisor:</td>
<td><a href="mailto:Lorna.Fitzsimons@dcu.ie">Lorna.Fitzsimons@dcu.ie</a></td>
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This project looks at the factors affecting solar panel efficiency for the production of hot water in Ireland. It reviews areas such as material choice, set-up of a solar collector system, international attitude towards solar energy and various other areas.

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<tr>
<td>Project Technology:</td>
<td>Solidworks</td>
</tr>
</tbody>
</table>

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### Project Number: 7

**Project Title:** Containerised microservice backend for CoderDojo  
**Name:** Cian Butler  
**Email:** cian.butler25@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Mark.Roantree@dcu.ie  

My project is to take the tightly coupled services that are the event and dojo management system used by CoderDojo to manage their more than 1000 dojos and make them independent and containerised. At CoderDojo, they have a very small team but have a very large project. Their software architecture is micro-services oriented, but the devops architecture has been built in a monolithic way, replicating a whole environment instead of exploiting microservices strength for scalability.

**Project Area:** Distributed Systems  
**Project Technology:** Docker, Node.js

### Project Number: 8

**Project Title:** Image recognition for vegetables  
**Name:** James Nathaniel De Ocampo  
**Email:** james.deocampo2@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Alistair.Sutherland@dcu.ie  

This is an Android application that aims to recognise images of vegetables. The user would take a picture of a vegetable on their Android device and the application would send the picture to a back-end server that performs the image recognition. The server contains a convolutional neural network that was developed using Tensorflow and Python.

**Project Area:** Android, Computer Vision, Mobile App  
**Project Technology:** Python, Java, Eclipse

### Project Number: 9

**Project Title:** Analysis and Optimisation of Vibration Bowls in XeroxDCTP  
**Name:** John Walls  
**Email:** john.walls2@mail.dcu.ie  
**Programme:** Mechanical and Manufacturing Engineering  
**Supervisor:** Harold.Esmonde@dcu.ie  

Vibratory bowl feeders are a key component of the assembly production lines at Xerox Dundalk Colour Toner Plant (DCTP), supplying correctly orientated plugs and handles for printer cartridge assembly. The aim of this project is to reduce the amount of downtime caused by vibratory bowl feeder inefficiencies during production runs. The project aims to minimise such downtime through vibration bowl analysis and the design of passive and active in-bowl tooling, thus contributing to overall production improvement.

**Project Area:** Mechanical Design and Manufacture  
**Project Technology:** Solidworks, PLC Programming, Excel/VB
### Project Number: 10

<table>
<thead>
<tr>
<th>Project Title:</th>
<th>Physics Room</th>
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</thead>
<tbody>
<tr>
<td>Name:</td>
<td>Conor Reddin</td>
</tr>
<tr>
<td>Email:</td>
<td><a href="mailto:conor.reddin3@mail.dcu.ie">conor.reddin3@mail.dcu.ie</a></td>
</tr>
<tr>
<td>Programme:</td>
<td>Computer Applications</td>
</tr>
<tr>
<td>Supervisor:</td>
<td><a href="mailto:Mark.Humphrys@dcu.ie">Mark.Humphrys@dcu.ie</a></td>
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</tbody>
</table>

My project is a “Physics Room” in which the user has complete control over the laws of physics. The project is a web browser application which is written in Three.js. The application is intended to be helpful to secondary-school students studying physics related subjects and can be used to replicate Leaving Cert-style questions. The behavior of the environment is determined by inputs from the user and feedback is provided to assist learning.

<table>
<thead>
<tr>
<th>Project Area:</th>
<th>Web Application, Graphics, Educational</th>
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</thead>
<tbody>
<tr>
<td>Project Technology:</td>
<td>HTML5, JavaScript, WebGL, Three.js, CSS</td>
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### Project Number: 11

<table>
<thead>
<tr>
<th>Project Title:</th>
<th>Design of a device for minimally invasive delivery of cartilage repair therapies</th>
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<tbody>
<tr>
<td>Name:</td>
<td>Niall Connolly</td>
</tr>
<tr>
<td>Email:</td>
<td><a href="mailto:niall.connolly6@mail.dcu.ie">niall.connolly6@mail.dcu.ie</a></td>
</tr>
<tr>
<td>Programme:</td>
<td>Biomedical Engineering</td>
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<tr>
<td>Supervisor:</td>
<td><a href="mailto:Tanya.Levingstone@dcu.ie">Tanya.Levingstone@dcu.ie</a></td>
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</table>

This project investigates developing a small, lightweight and ergonomic delivery device that would ensure the rapid and repeatable arthroscopic delivery of cartilage repair therapies to defect sites within the knee joint.

<table>
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<tr>
<th>Project Area:</th>
<th>Device Design</th>
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<tbody>
<tr>
<td>Project Technology:</td>
<td>Solidworks</td>
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### Project Number: 12

<table>
<thead>
<tr>
<th>Project Title:</th>
<th>Neural Sprint</th>
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<tr>
<td>Name:</td>
<td>Edward Moriarty</td>
</tr>
<tr>
<td>Email:</td>
<td><a href="mailto:edward.moriarty4@mail.dcu.ie">edward.moriarty4@mail.dcu.ie</a></td>
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<td>Computer Applications</td>
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<tr>
<td>Supervisor:</td>
<td><a href="mailto:Cathal.Gurrin@dcu.ie">Cathal.Gurrin@dcu.ie</a></td>
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</table>

This project “Neural Sprint” is a 2-D side scrolling platform game built within the Unity 5 engine that also contains a neural network using the NEAT [Neuroevolution of augmenting topologies] genetic algorithm, both developed using C#. When prompted to do so it will run, learn and evolve to complete the level presented to it. The game will also allow the user to take control and play the game as normal if so desired.

<table>
<thead>
<tr>
<th>Project Area:</th>
<th>Artificial Intelligence, Gaming</th>
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<tr>
<td>Project Technology:</td>
<td>C#</td>
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</tbody>
</table>
### Project Number: 13

**Project Title:** Receipt Management Application and Hardware  
**Name:** Eanna Byrne  
**Email:** eanna.byrne76@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** David.Gray@dcu.ie

This project aims to reduce or remove the need for paper receipts in everyday life by providing an easy to use application for storing and managing receipts. The project project also demonstrates how receipts may be transferred from a POS device to an Android device.

**Project Area:** Android  
**Project Technology:** XML, Java

### Project Number: 14

**Project Title:** Modelling and Analysis of Closed Loop Supply Chain Management for Reusable Articles  
**Name:** Evan Doherty  
**Email:** evan.doherty34@mail.dcu.ie  
**Programme:** Manufacturing Engineering with Business  
**Supervisor:** John.Geraghty@dcu.ie

This report is compiled to explore the extensive meanings of Closed Loop Supply Chain Management, mostly concentrating on reusable articles. The case study is based on the Supply chain between a pharmaceutical company and one of its suppliers, who have recently changed to a closed loop supply chain using a reusable article. A simulation has been assembled to probe the issues that may arise with this reusable articles and to see if it’s a plausible solution for other companies.

**Project Area:** Closed Loop Supply Chains  
**Project Technology:** ExtendSIM

### Project Number: 15

**Project Title:** Appointments Manager  
**Name:** Jose Mulowayi  
**Email:** j.mulowayi2@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Martin.Crane@dcu.ie

Appointments Manager is available on both mobile and web platforms. This application lets users see dates/times availability for doctor surgery. Once a user makes/cancels an appointment, a notification text message is sent to their phone. Users can register interest for a time slot already taken and whoever is first in the waiting queue will get it allocated to him in case of cancellation. This application is adaptable to many professionals including university lecturers, sport clubs, government agencies and more.

**Project Area:** Android, Mobile App, Web Application  
**Project Technology:** SQL, SpringMVC, REST, Java, AngularJS
Project Number: 16

Project Title: Development of a Lean/Six Sigma toolbox for water conservation in manufacturing processes
Name: Fearghal O’Hare
Email: fearghal.ohare3@mail.dcu.ie
Programme: Mechanical and Manufacturing Engineering
Supervisor: Lorna.Fitzsimons@dcu.ie

Lean and Six Sigma tools have been widely applied to drive efficiency in manufacturing processes. The aim of this project is to assess the appropriateness of Lean/Six Sigma approaches for water conservation in a manufacturing environment. The objective of this project is to assess individual methods, for example, DMAIC Process, vertical integration, and their appropriateness for use in manufacturing. The process includes developing a Lean/Six Sigma toolkit and by using a case study, assessing the toolkit’s performance.

Project Area: Lean Manufacturing
Project Technology: Excel/VB

Project Number: 17

Project Title: TutorMe
Name: Mark Gerrity
Email: mark.gerrity2@mail.dcu.ie
Name: James Burke
Email: james.burke47@mail.dcu.ie
Programme: Enterprise Computing
Supervisor: Jane.Kernan@dcu.ie

TutorMe is a cross-platform tutoring service that allows a student to easily book private grinds with a tutor of their choice. This app aims at creating a simple, all-inclusive service that encapsulates every step needed to be taken when booking a grind. The project itself will showcase a web and mobile application prototype, demonstrating some of the features available through TutorMe.

Project Area: Web Application, Mobile App, Databases, Android
Project Technology: PHP, SQL, CSS, HTML5, JavaScript, Java

Project Number: 18

Project Title: Grapevine
Name: John Garrahan
Email: john.garrahan2@mail.dcu.ie
Name: Seán Cahill
Email: seanrcahill@gmail.com
Programme: Enterprise Computing
Supervisor: Markus.Helfert@dcu.ie

The aim of our app is to replace the need for a booking agent by allowing the musician to become their own agent by providing a single platform for them to book gigs for themselves. By having a LinkedIn style profile, including photos, bios, reviews, social media content and upcoming gigs, it will provide a transparent view of each user. With our app, we will be targeting the gigging sub-sector of the music industry.

Project Area: Android, Mobile App, Social Networking
Project Technology: CSS, Eclipse, HTML5, Java, JavaScript, PHP, SQL
Project Number: 19
Project Title: Scrum Web App
Name: George McNally
Email: george.mcnamally7@mail.dcu.ie
Programme: Computer Applications
Supervisor: Paul.M.Clarke@dcu.ie

This web application facilitates the activities of scrum along with being integrated with Git. Users can create projects which contain project members, the product backlog and sprints. In addition, the project can be connected to the project’s Git repository. Once connected, users can submit issues with pieces of code that they are having difficulty with. These issues can be solved by other team members, committed and pushed back to origin.

Project Area: Model View Controller, Web Application
Project Technology: NoSQL, AngularJS, CSS, HTML5, JavaScript, JQuery, Node.js, REST

Project Number: 20
Project Title: Analysis of the Toyota Production System
Name: Saif Alasmi
Email: saif.alasmi2@mail.dcu.ie
Programme: Mechanical and Manufacturing Engineering
Supervisor: Tamas.Szecsi@dcu.ie

The project involves the analysis of a world-leader operations management system (TPS). It will highlight the major contributions of TPS to operations management, and the main shortcomings of the system.

Project Area: Lean Manufacturing
Project Technology: ExtendSIM

Project Number: 21
Project Title: Mapping Jobs
Name: Artur Vorobjov
Email: artur.vorobjov2@mail.dcu.ie
Programme: Computer Applications
Supervisor: Brian.Stone@dcu.ie

Mapping Jobs is a web application that provides a graphical representation (SVG map of Ireland) of careers statistics in Ireland broken down by county; careers group: which is defined as a job sector, for example, Arts, Audio/Video Technology and Communications; and average salary. Mapping jobs interacts with external jobs websites through the use of web scraping technology to extract the required data. In addition, polling technology will be used to refresh data from the external websites at a customisable interval.

Project Area: Web Application
Project Technology: AngularJS, CSS, HTML5, JavaScript, Node.js, REST, SQL
### Project Number: 22

**Project Title:** FitFinder  
**Name:** Eoin McKenna  
**Email:** eoin.mckenna23@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Geoff.Hamilton@dcu.ie  

This Android mobile app is designed to give people a single platform to find and begin communications with personal trainers offering fitness classes in their general area. The app will also give users a basic platform to record their own fitness regime.

**Project Area:** Android, Mobile App  
**Project Technology:** Java, PHP, SQL

### Project Number: 23

**Project Title:** Method of Data Integration  
**Name:** Lin Zhu  
**Email:** lin.zhu4@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Alan.Smeaton@dcu.ie  

This project performs a systematic analysis on three different data integration tools which are Talend, Pentaho and Jitterbit. It uses three different datasets as cases to analyse each and perform an analysis on connecting speed, connect method, limitations (like data size, type or any table properties), flexibility of the user interface and how easy those settings are for beginners, and also system usability concerning integration.

**Project Area:** Databases, Data Analytics, Data Integration  
**Project Technology:** Python, R, SQL, Talend, Pentaho, Jitterbit

### Project Number: 24

**Project Title:** Turf torque tester  
**Name:** Diarmaid Sheridan  
**Email:** diarmaid.sheridan35@mail.dcu.ie  
**Programme:** Mechanical and Manufacturing Engineering  
**Supervisor:** Brian.Corcoran@dcu.ie  

At Croke Park there are several tests performed to certify the pitch to a certain standard. One of these tests involves the torque experienced by a stud arrangement when embedded in the turf and a twist is applied. This project was set out to design and manufacture a new device to perform this test which is more repeatable and gives reproducible results.

**Project Area:** Device Design  
**Project Technology:** Solidworks
Project Number: 25

Project Title: Smartphone-based Indoor Positioning System
Name: David Gallagher
Email: david.gallagher43@mail.dcu.ie
Programme: Electronic and Computer Engineering
Supervisor: Robert.Sadleir@dcu.ie

Indoor positioning systems function using signal fingerprinting in conjunction with sensor data to provide a rough indication of position. This project investigates the use of these data sources, which are readily available on modern smartphone devices, to create an indoor navigation application. A number of different location detection methods were developed during the project and these were evaluated in terms of accuracy by comparing their outputs with ground truth data that was also obtained as part of the project.

Project Area: Mobile App, Android
Project Technology: Java

Project Number: 26

Project Title: The Design and Manufacture of a System To Positively Control a Trailer’s Steering
Name: Cathal Deacon
Email: Cathal.deacon2@mail.dcu.ie
Programme: Manufacturing Engineering with Business
Supervisor: Paul.Young@dcu.ie

This project involves the design and manufacture of a system to positively control a trailer’s steering, in relation to that of the angle of the towing vehicle. This is achieved through a mechanical linkage system connected to the tractor, which activates master cylinders which in turn activate slave cylinders placed on the trailer’s axles. This design was manufactured and tested by Distag QCS who supply trailer axles to machinery manufacturers throughout Ireland and the U.K.

Project Area: Mechanical Design and Manufacture
Project Technology: Solidworks

Project Number: 27

Project Title: Automatic Transliteration between English and Russian
Name: Kieron Drumm
Email: kieron.drumm2@mail.dcu.ie
Programme: Computer Applications
Supervisor: Qun.Liu@dcu.ie

The main goal for this project is to implement an automatic transliteration system that can convert a proper noun from English to Russian. With the use of Moses, this system is trained by applying the principles of statistical machine translation augmented in such a way to account for transliteration rather than translation. This system is intended to be used by Russian language learners and teachers.

Project Area: Statistical Machine Transliteration, Machine Learning
Project Technology: Python, Moses, Scrapy
**Project Number: 28**

**Project Title:** Crystal-Mania

**Name:** Mark Gorman

**Email:** mark.gorman8@mail.dcu.ie

**Programme:** Computer Applications

**Supervisor:** Paul.M.Clarke@dcu.ie

Crystal-Mania is a 2D sidescrolling game which focuses on the collection of collectibles spread across the game’s various levels. Players aim to collect enough of these collectibles to upgrade their character sufficiently to make it through the challenges that the game has to offer. Crystal-Mania was developed in the Unity Engine using C#.

**Project Area:** Gaming

**Project Technology:** C#

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**Project Number: 29**

**Project Title:** Computational simulation and analysis of statistical Six Sigma production techniques

**Name:** Cian O’Hagan

**Email:** cian.ohagan5@mail.dcu.ie

**Programme:** Biomedical Engineering

**Supervisor:** Tamas.Szecsdi@dcu.ie

Two statistical Six Sigma production techniques featured in this study. The concept of partial interchangeability was demonstrated through statistical tolerance analysis in C++ that showed that this financially beneficial technique can be successfully implemented in certain production scenarios. This project also demonstrated the implementation of linear discriminant analysis in C++ and potential applications this statistical technique can have in manufacturing engineering.

**Project Area:** Statistical Analysis

**Project Technology:** Eclipse, C/C++

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**Project Number: 30**

**Project Title:** Simulation of Radiance in Water Bodies

**Name:** Liam Finn

**Email:** liam.finn7@mail.dcu.ie

**Programme:** Computer Applications

**Supervisor:** Liam.Tuohey@dcu.ie

This project takes the optical properties of water and simulates the radiance from the water body. The inputs to this simulation include the absorption and scattering coefficients gathered through sensor technologies in water bodies. The system allows the user to see how changes in the optical properties impact the calculated radiance. The radiance is calculated using the inputted optical properties and displayed graphically.

**Project Area:** Sensor Data, Graphics

**Project Technology:** Eclipse, Java
**Project Number: 31**

**Project Title:** MR fluid external door latch  
**Name:** Declan Hughes  
**Email:** declan.hughes25@mail.dcu.ie  
**Programme:** Mechanical and Manufacturing Engineering  
**Supervisor:** Alan.Kennedy@dcu.ie

External doors into many public places have heavy doors with stiff automatic closing mechanisms to remain closed in windy weather. People with disabilities, the elderly, and people attempting to enter a building with a pram or mobility device may struggle to open these kinds of doors. The aim of this project is to design a latch which will exhibit a strong holding force against the wind and be as easy to open as possible when required.

**Project Area:** Device Design  
**Project Technology:** MR fluid

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**Project Number: 32**

**Project Title:** Student Support And Development Application  
**Name:** Victor Adeboye Akinla  
**Email:** victor.akinla2@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Monica.Ward@dcu.ie

The Student Support and Development application is aimed at providing DCU students with a more accessible and aesthetically pleasing version of the online orientation section of the DCU website. It uses data from the Student Support and Development website and converts it into a tailored app for mobile phones.

**Project Area:** Android  
**Project Technology:** Java

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**Project Number: 33**

**Project Title:** CycLED  
**Name:** Shane O’Neill  
**Email:** shane.oneill65@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** David.Sinclair@dcu.ie

This project is a helmet which can direct cyclists to their destination. Lights in the helmet tell a user whether to turn left or right at each turn. The helmet has an Arduino on board which connects with an Android app, where the user can select their destination and any waypoints on their route. The helmet also has GPS on board so will still work if untethered from the phone.

**Project Area:** Android, Arduino, Internet of Things, Mobile App, Wearable Technology  
**Project Technology:** C/C++, Java
Project Number: 34

Project Title: Research and Development of Electronic Cymbal Sensors
Name: Matthew Agnew
Email: matthew.agnew3@mail.dcu.ie
Programme: Manufacturing Engineering with Business
Supervisor: Alan.Kennedy@dcu.ie

This project centres on investigating current electronic cymbals, both homemade and commercial with subsequent methodical testing with the objective of finding the optimum position to place a sensor in an electronic cymbal. This project focuses around the all-important positioning of piezo sensors with the objective of producing accurate, reliable and authentic cymbal sound.

Project Area: Sensor Technology
Project Technology: DSP

Project Number: 35

Project Title: Serverless Microservices PaaS
Name: Jacob O’Keeffe
Email: jacob.okeeffe22@mail.dcu.ie
Programme: Computer Applications
Supervisor: Paul.M.Clarke@dcu.ie

Microservice architectures are appealing because they allow individual components of an application to be deployed and scaled independently. However, some of these components are too small or infrequently used to warrant the provisioning of a server specifically for that microservice. The notion of ‘serverless microservices’ addresses this issue by providing a platform on which developers can host a number of these smaller microservices. The platform automates the execution of these microservices as corresponding messages flow inwards.

Project Area: Microservice Deployment
Project Technology: Docker, JavaScript, Node.js

Project Number: 36

Project Title: The Incorporation of Biocompatible Dyes into Biomaterials
Name: James Kelly
Email: james.kelly93@mail.dcu.ie
Programme: Biomedical Engineering
Supervisor: Tanya.Levingstone@dcu.ie

Over the last decade, there has been an marked increase in procedures addressing cartilage repair. This project investigates the addition of biocompatible dyes into biomaterials used for cartilage and bone regeneration, as means of identifying correct surgical implantation and identification. The specific focus of this project is to identify suitable dyes for use in a collagen scaffold – a device for cartilage and bone regeneration.

Project Area: Tissue Engineering
Project Technology: Infinite® 200 NanoQuant
Project Number: 37

Project Title: Project Whurl: Performance Analysis and Real-time Injury Awareness for Hurling
Name: Aaron Steed
Email: aaron.steed2@mail.dcu.ie
Programme: Computer Applications
Supervisor: David.Sinclair@dcu.ie

Project Whurl uses an Arduino system to capture GPS data to measure a player’s performance, where post-match a manager can review completed statistics on his/her dashboard. As well as this, managers can also be informed in real-time if a player has incurred an injury suddenly or has developed an injury during the period of the game. The system also suggests the immediate action a manager should take with regards to his/her player’s safety within the real-time notification.

Project Technology: C/C++, Java, Python, REST, NoSQL

Project Number: 38

Project Title: FPGA implementation and performance analysis of block cipher PRINCE
Name: Philip Clarke
Email: philip.clarke26@mail.dcu.ie
Programme: Electronic and Computer Engineering
Supervisor: Xiaojun.Wang@dcu.ie

PRINCE is a low-latency block cipher for pervasive computing applications. This project is to implement the PRINCE block cipher on FPGA, and analyse its performance in terms of throughput, hardware resource requirement and power consumption. The implementation should be efficient in terms of space and power consumption, so that it can be deployed in resource and power constrained devices in the internet of things application scenarios. The implementation should also consider resistance to side-channel attacks.

Project Area: Cryptography
Project Technology: VHDL

Project Number: 39

Project Title: Flood Analysis System
Name: Karl Gillespie
Email: karl.gillespie3@mail.dcu.ie
Programme: Computer Applications
Supervisor: Marija.Beziavina@dcu.ie

This project is to help detect floods during severe weather conditions. It uses SAR images provided by the European Space Agency to train a neural network to recognise flooded areas and provide information about the affected areas. The aim of the project is to investigate the effectiveness of new emerging image classification architectures in providing an early warning system against the increasing adverse weather conditions caused by climate change.

Project Area: Sensor Technology, Image Video Processing, GPS GIS, Environmental Mapping, Data Analytics, Automation, Artificial Intelligence
Project Technology: Python
Project Number: 40

Project Title: Investigation of braided fibre structures for applications as ligaments or tendon replacements
Name: Evin Keane
Email:evin.keane24@mail.dcu.ie
Programme: Biomedical Engineering
Supervisor: Garrett.McGuinness@dcu.ie

This project investigates the mechanical properties of various braided PVA fibre structures, for applications as artificial ligament replacements. Specifically, this project focuses on the ACL for the basis of desirable mechanical properties and aims to suggest a suitable braided structure that can be further explored in future research projects. The project consisted of three phases, which involved the design of a braiding rig to generate braided structures, the generation of braided PVA structures and mechanical testing of generated fibres.

Project Area: Biomedical Engineering
Project Technology: Solidworks

Project Number: 41

Project Title: Holla Recruitment
Name: Chikelue Emmanuel Okigb
Email:chikelue.okigbo2@mail.dcu.ie
Name: Conor Brabazon
Email:conor.brabazon2@mail.dcu.ie
Name: Denise Purvina
Email:denise.purvina2@mail.dcu.ie
Programme: Enterprise Computing
Supervisor: Markus.Helfert@dcu.ie

For this project we have created a web application to advertise local jobs to ideal candidates and to provide students with a useful recruitment tool. Our application is designed to grant students a source of income in the form of short-term employment. We have engineered a server and a mobile application from which our services can be accessed.

Project Area: Web Application
Project Technology: CSS

Project Number: 42

Project Title: Heads-Up Computer Poker
Name: Neil Saccardo
Email:neil.saccardo2@mail.dcu.ie
Programme: Computer Applications
Supervisor: David.Sinclair@dcu.ie

This project allows users to play Heads-Up Texas hold’em poker. Heads-Up poker is one-on-one poker in which the blinds increase as the game progresses. The project consists of the Poker AI, developed in Java, and an AngularJS/HTML5 front end which allows users to play a game against the AI in their web browser.

Project Area: Artificial Intelligence, Web Application
Project Technology: AngularJS, Java
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MyMedication is a notification-based medication scheduler that helps to assist the user in organising, tracking and taking their medications. It is designed to simplify the process and remove any uncertainties. MyMedication informs the user with constant notifications and alerts until they have interacted with our application and have selected they have taken their medications. The user can also designate a next of kin/carer who will receive these alerts when the user hasn’t taken their medications.

**Project Area:** Mobile App, Databases, Android  
**Project Technology:** SQL, Java, HTML5, CSS

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Absentify is an absence tracking web application, initially aimed at schools. It allows parents/guardians to digitally submit the reason for their child’s absence to the school. Absentify replaces the current inefficient pen and paper note system. It automates the system, making it more efficient for both parents/guardians and schools. Parents/guardians are more likely to submit the required information and it is stored in a single repository. The application is built using the MEAN stack.

**Project Area:** Web Application  
**Project Technology:** AngularJS, CSS, HTML5, Node.js, REST, Async, Bootstrap, Backbone.js, ExpressJS, MongoDB, Mongoose, Passport.js

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<td><strong>Supervisor:</strong></td>
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This project is an Android-based project that controls Linux PC keyboard functions and mouse operations through an Android mobile phone. The application requires a WiFi connection between the computer and the Android device helping a user to access the computer remotely instead of sitting beside it overcoming the limitations of a mouse and keyboard.

**Project Area:** Android  
**Project Technology:** Java
Project Number: 46

Project Title: CourseHappy
Name: Áine Nic Suibhne
Email: aine.nicsuibhne2@mail.dcu.ie
Name: Danika Doonan
Email: danika.doonan2@mail.dcu.ie
Programme: Enterprise Computing
Supervisor: Markus.Helfert@dcu.ie

CourseHappy is a unique web application designed to guide potential third level students to their future academic path. Our application is tailored to help students find a third level college and course that caters to their personality and individual aptitude level. The psychometric questions asked by our application will depend on the users’ choice of field, e.g., computing, nursing, etc. Our unique scoring mechanism will present their results of college courses in a table format making their college preference effortless!

Project Area: Web Application
Project Technology: HTML5, JavaScript, PHP, SQL, CSS

Project Number: 47

Project Title: Apptendance
Name: Ryan Treanor
Email: ryan.treanor2@mail.dcu.ie
Programme: Computer Applications
Supervisor: Marija.Bezbradica@dcu.ie

This project is an Android application that uses the Google Maps API and the user’s current location to create a lecture attendance recording platform. This application will use the user’s timetable to show on the map where the user’s next lecture is and also the lecture time. Once the time approaches the lecture time the application will record the lecture as ‘Attended’-based on the user’s current location and the lecture location.

Project Area: Mobile App, Android
Project Technology: Java, SQL, XML

Project Number: 48

Project Title: Efficient Simulation Techniques for Circuits
Name: Robert Beirne
Email: robert.beirne3@mail.dcu.ie
Programme: Electronic and Computer Engineering
Supervisor: Marissa.Condon@dcu.ie

This project examines simulation techniques for circuits with oscillatory signals. The envelope transient harmonic balance and the envelope following method are considered. This project is concerned with linear and nonlinear circuits. The methods are compared to standard differential equation solvers in terms of efficiency and accuracy.

Project Area: Circuit Modeling
Project Technology: MATLAB
## Project Number: 49

**Project Title:** Car Service History  
**Name:** Povilas Auskalnis  
**Email:** povilas.auskalnis2@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Stephen.Blott@dcu.ie  

Car Service History moves paper-based car service history onto the internet by storing servicing details online where it will not get lost throughout the lifetime of a car. It makes use of optical character recognition to read registrations and associates servicing history to each car identified by the registration in a central location. It simplifies car buying by making it easy for potential buyers to check out the servicing history of a car before going to view it.

**Project Area:** Android, Automotive Technology, Databases, Mobile App, Model View Controller, Network Applications, Software Development, Web Application  
**Project Technology:** CSS, HTML5, Java, JavaScript, JQuery, Node.js, REST, NoSQL, Optical character recognition

## Project Number: 50

**Project Title:** Very Low Frequency (VLF) Radio Observatory  
**Name:** Fady Makram Max Abdelmalek  
**Email:** fady.abdelmalek2@mail.dcu.ie  
**Programme:** Information and Communications Engineering  
**Supervisor:** Patrick.McNally@dcu.ie  

The Earth produces electromagnetic radiation due to natural phenomena such as thunderstorms or aurorae and can also experience “sudden ionospheric disturbances” [SIDs] during solar flares. These disrupt telecommunications and GPS systems. SIDs are especially easy to measure in the VLF spectral region (e.g. 3-30+ kHz). This project discusses the design of a VLF receiver and will use captured data to extract information on the state of the Earth’s ionosphere.

**Project Area:** Telecommunications, Power Electronics, Circuit Modeling, Arduino  
**Project Technology:** MATLAB, LTSpice for designing the circuit and Arduino for switching

## Project Number: 51

**Project Title:** Consensus: Ad recommendation system  
**Name:** Robert Lucey  
**Email:** robert.lucey3@mail.dcu.ie  
**Name:** Luke Barr  
**Email:** luke.barr2@mail.dcu.ie  
**Programme:** Computational Problem Solving and Software Development  
**Supervisor:** David.Gray@dcu.ie  

Displaying appropriate advertisements using machine learning techniques in a custom collaborative filtering system to passersby based on their interests and demographics. Interests are supplied by an installable Android library coordinating with nearby low energy bluetooth beacons placed around advertisement displays. Demographics are gained through cameras placed around these advertisement displays, images are then sent to Microsoft’s Computer Vision API for image classification. Using a combination of this data an appropriate advertisement is chosen.

**Project Area:** Android, Artificial Intelligence, Data Analytics, Machine Learning, Computer Vision  
**Project Technology:** Java, Python, REST, NoSQL, JSON
**Project Number: 52**

**Project Title:** CollegeJobs  
**Name:** Darren Dowling  
**Email:** darren.dowling22@mail.dcu.ie  
**Name:** Dean Cregan  
**Email:** dean.cregan2@mail.dcu.ie  
**Programme:** Enterprise Computing  
**Supervisor:** Rory.OConnor@dcu.ie

Collegejobs is a jobs platform that enables college students to apply for graduate jobs and internships. This service will combine the conventional jobs website with a tracking and matching service to improve the recruitment experience. The site will be effective in matching employers with appropriate work candidates based on skills, experience, courses studied, etc. Collegejobs will enable students to register as job seekers, build their profiles and search for jobs and internships matching their skill sets.

**Project Area:** Web Application  
**Project Technology:** PHP, SQL, Bootstrap, JQuery, JavaScript, Java, CSS, HTML5

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**Project Number: 53**

**Project Title:** College Carpool  
**Name:** Stephen Cassedy  
**Email:** stephen.cassedy2@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Marija.Bezbradica@dcu.ie

College Carpool is a mobile application designed for an Android system. It caters for college students looking to carpool to and from college. The app has a few main features including login/registration, instant messaging, real-time user mapping and carpool planning. User information is stored in JSON format in a Firebase database.

**Project Area:** Mobile App, Instant Messaging, Databases, Android  
**Project Technology:** XML, Java

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**Project Number: 54**

**Project Title:** Anti-Sway Control  
**Name:** Mark Grimes  
**Email:** mark.grimes6@mail.dcu.ie  
**Programme:** Mechatronic Engineering  
**Supervisor:** Harold.Esmonde@dcu.ie

Anti-Sway control is implemented in crane systems so that when the payload is moved from one point to another it does not sway at the end of its travel. In this project antisway control will be implemented on a rigid and a flexible system for comparison purposes with a view to improving anti-sway control for the flexible case. Various control schemes will be considered by modeling the system and simulating proposed control strategies.

**Project Area:** Control Systems  
**Project Technology:** MATLAB
**Project Number: 55**

**Project Title:** Schedule Me  
**Name:** Ruth Kelly  
**Email:** ruth.kelly58@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Donal.Fitzpatrick@dcu.ie

Schedule me is a web application which handles all aspects of scheduling staff in businesses that operate on a shift-work basis. Every staff member has their own account in which they input their availability and their time-off requests. The application uses this information, along with information given by the manager, to generate a roster.

**Project Area:** Web Application  
**Project Technology:** CSS, Clojure ClojureScript Elasticsearch, REST, HTML5

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**Project Number: 56**

**Project Title:** Altruism in Simple Societies  
**Name:** Shane Ryan  
**Email:** shane.ryan79@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Mark.Humphrys@dcu.ie

Altruistic traits have survived in humans and other species for thousands of years – the ability to cooperate provides an evolutionary advantage. But in the zero-sum game of survival, being too trusting is fatal. This project was built to provide a simulation environment to measure the performance of various strategies among creatures competing for survival. Agents controlled by AI algorithms move about a 3D landscape collecting and/or sharing ‘food’ needed for their survival and reproduction.

**Project Area:** Artificial Intelligence, Simulation  
**Project Technology:** Unity, C#

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**Project Number: 57**

**Project Title:** eTasker app for business – flexible and effective tool for managing tasks, processes and employees  
**Name:** Egidijus Zutautas  
**Email:** egidijus.zutautas2@mail.dcu.ie  
**Programme:** Computational Problem Solving and Software Development  
**Supervisor:** David.Gray@dcu.ie

Managers, in real-time, can see tasks and employee locations on a map, assign tasks and monitor their execution. Employees can see all tasks they have been assigned to on their mobile app, constantly report task status, inform about materials used and take a photo of the work done. Clients sign completed task by leaving their signature in the employee’s eTasker app and rate quality of received service.

**Project Area:** Software Development, Web Application, Mobile App, Android  
**Project Technology:** REST, Spring-Boot, Java, Maven, Log4J, HSQLDB, HTML/CSS, JS/jQuery, AJAX, Bootstrap, Git, Junit, Android SDK, Jenkins, Waffle.io
Project Number: 58

**Project Title:** Analysis of Six Sigma Tools and Techniques  
**Name:** Aoife Gaffney  
**Email:** aoife.gaffney23@mail.dcu.ie  
**Programme:** Biomedical Engineering  
**Supervisor:** Tamas.Szecsi@dcu.ie

The project involves the analysis of tools and techniques used in Six Sigma manufacturing, with a focus on statistical tools. The project investigates how these tools can be applied to a manufacturing process, using raw data. The application areas, advantages and disadvantages of each tool are also examined through the analysis of various case studies.

**Project Area:** Six Sigma  
**Project Technology:** Excel/VB

Project Number: 59

**Project Title:** SecurIOT  
**Name:** Freddie Hayden  
**Email:** haydenf3@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Stephen.Blott@dcu.ie

An Internet of Things-based household security system using Android and Raspberry Pi. The system allows for a range of smart devices to be integrated using WiFi or, a standardised protocol, z-wave. The user can monitor their home security, change or trigger security responses, and remotely change system setting from an application on their Android device. Applications are securely paired with the home system to ensure privacy. Peace of mind in your pocket.

**Project Area:** Android, Internet of Things, Mobile App, RaspberryPi, Software Development  
**Project Technology:** C/C++, Java

Project Number: 60

**Project Title:** Video Captioning using Neural Networks  
**Name:** Dionne Meehan  
**Email:** dionne.meehan8@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Alan.Smeaton@dcu.ie

This project classifies basic frame captions from a neural network using natural language processing, exploits alternative tagging to optimise and enhance the captions leading to the derivation of an overall augmented caption for Vine videos. This project uses a variety of technologies including IBM’s Watson image recognition and natural language processing together with off-the-shelf image tagging APIs.

**Project Area:** Artificial Intelligence, Data Analytics, Image Video Processing, Natural Language Processing, Software Development  
**Project Technology:** Python, Eclipse, REST
### Project Number: 61

Name: J.P. Casserly  
Email: johnpaul.casserly3@mail.dcu.ie  
Name: Sam Benville  
Email: samuel.benville2@mail.dcu.ie  
Programme: Enterprise Computing  
Supervisor: Gareth.Jones@dcu.ie

CloudCleanse is a website-based service that will help the user review and sanitise all of their social media accounts. Our system will automatically crawl through the user’s social media account and by using a list of predetermined blacklisted words we can detect any adverse behaviour they may wish to review and then delete.

**Project Area:** Automation, Information Retrieval, Social Networking  
**Project Technology:** SQL, PHP, Java

### Project Number: 62

Name: Niall Kiely  
Email: niall.kiely5@mail.dcu.ie  
Programme: Computer Applications  
Supervisor: Monica.Ward@dcu.ie

This project is a video game application to help students learn a new language. Each game targets a different area of the language learning process. The teacher can view the student’s results in these games to see where improvement is needed. The project aims to add enjoyment and interactivity to language learning while improving the student’s ability.

**Project Area:** Educational, Gaming, Computer Assisted Language Learning (CALL)  
**Project Technology:** C#, PHP, SQL, Unity

### Project Number: 63

Name: Faith Nneka Isichei  
Email: Faith.Isichei2@mail.dcu.ie  
Name: Sean Ryan  
Email: Sean.Ryan77@mail.dcu.ie  
Programme: Enterprise Computing  
Supervisor: Andrew.McCarren@dcu.ie

The need to improve our lifestyle has lead to the creation of wearable technologies such as Fitbit. It has also lead to the creation of applications such as My Fitness Pal. However all these applications and devices are merely for personal use and lack the ability to let healthcare professionals access this data. This problem resulted to the birth of SATIS Healthcare. SATIS stands for Secure Analytical Technical Information Services hence summarising the aim of our final year project.

**Project Area:** Android, Cloud Computing, Databases, Data Analytics, Data Mining, Information Retrieval, Mobile App, Software Development, Web Application  
**Project Technology:** SQL, PHP, CSS, Java, JavaScript, Node.js
Project Number: 64

**Project Title:** Automatic Error Correction Tool  
**Name:** Lauren Geoghegan  
**Email:** lauren.geoghegan7@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Andy.Way@dcu.ie

This is an automatic error correction tool for academic papers. These errors include improper use of academic and scientific English and incorrect placement of references. These specific errors lie undetected by word processors and other tools, but are critical if good-quality academic writing is to be assured. The application allows a user to upload their chosen file in any text format where the engine will perform analysis, and the corrected version of the file is returned.

**Project Area:** Educational  
**Project Technology:** Python

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Project Number: 65

**Project Title:** Drone Traffic Simulation  
**Name:** Jack Murphy  
**Email:** jack.murphy238@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Alan.Smeaton@dcu.ie

This project simulates drone traffic in a cityscape environment. It achieves a smooth flow of traffic by using multiple lanes using the width of each street as well as the height of the buildings to protect the drones from the effects of the weather. The simulation will be run increasing the number of the drones until there is a collision. The statistics will be gathered and presented to show the effectiveness of the system.

**Project Area:** Data Analytics, Automation, 3D Modelling, Simulation, Software Development  
**Project Technology:** .NET, C#, R, SQL, Nunit, EntityFramework

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Project Number: 66

**Project Title:** Derma Monitoring Application  
**Name:** Conchuir Lynch  
**Email:** conchuir.lynch84@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Suzanne.Little@dcu.ie

This Android application allows users with skin issues to monitor changes as early as possible and to take action. Using intelligent image processing, this application can monitor several of the user’s skin irregularities such as melanomas, psoriasis and acne. Using insights from dermatology, this application promotes long term self-examination and allows users to share their results and records with dermatologists and doctors. This application also retrieves information for its users, relevant to their specific skin concern.

**Project Area:** Android, Computer Vision, Information Retrieval, Image Video Processing, Mobile App  
**Project Technology:** Java, PHP, SQL, XML, OpenCV
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<tr>
<th>Project Number</th>
<th>Project Title</th>
<th>Name</th>
<th>Email</th>
<th>Programme</th>
<th>Supervisor</th>
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<tbody>
<tr>
<td>67</td>
<td>Omniwheel Platform for Environment Sensing</td>
<td>Abin Saju</td>
<td><a href="mailto:abin.saju2@mail.dcu.ie">abin.saju2@mail.dcu.ie</a></td>
<td>Mechatronic Engineering</td>
<td><a href="mailto:Jennifer.Bruton@dcu.ie">Jennifer.Bruton@dcu.ie</a></td>
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<td></td>
<td>Design of an Omni-wheel platform for low-cost environment sensing. Research into different types of wheels and sensors to effectively avoid obstacles. The project involves analysis of the wheel mechanics, sensor selection, micro-controller wheel actuation, sensor data acquisition and motion control.</td>
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<th>Email</th>
<th>Programme</th>
<th>Supervisor</th>
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<tbody>
<tr>
<td>68</td>
<td>Machine Translation for Food Ingredients</td>
<td>Matthew Tang</td>
<td><a href="mailto:matthew.tang2@mail.dcu.ie">matthew.tang2@mail.dcu.ie</a></td>
<td>Computer Applications</td>
<td><a href="mailto:Andy.Way@dcu.ie">Andy.Way@dcu.ie</a></td>
</tr>
<tr>
<td></td>
<td>This application allows multiple users to store their details (names and allergies) and the application notifies the user whether it is safe to consume a product, based on this information. The application will prompt the user to take a photo of the allergen label of the product. The allergens will be read in and, if need be, translated into the user’s preferred language before checking the user’s known allergens.</td>
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<th>Project Area</th>
<th>Project Technology</th>
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<tbody>
<tr>
<td>Mobile App, Optical Character Recognition, Android</td>
<td>XML, Java</td>
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<th>Email</th>
<th>Programme</th>
<th>Supervisor</th>
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<tr>
<td>69</td>
<td>Design, Build and Control of a 3D Printer</td>
<td>Abdulmuhsen Al Fayez</td>
<td><a href="mailto:abdulmuhsen.alfayez2@mail.dcu.ie">abdulmuhsen.alfayez2@mail.dcu.ie</a></td>
<td>Manufacturing Engineering with Business</td>
<td><a href="mailto:Joseph.Stokes@dcu.ie">Joseph.Stokes@dcu.ie</a></td>
</tr>
<tr>
<td></td>
<td>Rapid prototyping is changing the product development process and the manufacturing industry in general, it enables engineers to create prototypes within few hours and fraction of the cost. This project aims to source two 3D printer kits and then design and build through integrating the two printers into one and control a double deposition 3D printer, in order to enhance its functionality and to reduce manufacturing time.</td>
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<tr>
<th>Project Area</th>
<th>Project Technology</th>
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<tr>
<td>3D Modelling, Additive Manufacturing, Mechanical Design and Manufacture</td>
<td>Solidworks</td>
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Project Number: 70

Project Title: iDMe
Name: Orla Dunne
Email: orla.dunne22@mail.dcu.ie
Name: Evelyn Noonan
Email: evelyn.noonan4@mail.dcu.ie
Programme: Enterprise Computing
Supervisor: Cathal.Gurrin@dcu.ie

Our mobile application iDMe digitalises your government identification documents such as your passport, in order to provide proof of your identification. This application will replace the need for carrying a physical copy of your ID. Our application was developed with the aim of reducing the chances of users misplacing their ID, while considering technology trends such as IoT.

Project Area: Android
Project Technology: Java, PHP, SQL, CPanel

Project Number: 71

Project Title: TextEngine
Name: Imogen Stewart
Email: 13312376@mail.dcu.ie
Programme: Computational Problem Solving and Software Development
Supervisor: David.Gray@dcu.ie

TextEngine is a framework that provides facilities for developing text-based multiplayer games, written in C++ and delivered through the web stack (HTML/CSS/JS). The framework comes with a HTTP API for supplying data to the web page, a web front end with HTML Canvas renderer and an example game, as well as various support features like terrain generation, saving/loading and account management.

Project Area: Gaming
Project Technology: C/C++

Project Number: 72

Project Title: Design of a Haptic Feedback Device for Flight Condition and Situational Awareness
Name: Osama Hammad
Email: osama.hammad2@mail.dcu.ie
Programme: Mechatronic Engineering
Supervisor: Noel.Murphy@dcu.ie

This project proposes a solution for the problem of sensory saturation in aircraft pilots. Research has shown this problem to be a significant cause of aircraft accidents. The project uses flight simulation software to provide information about the condition of an aircraft in flight, including ‘slip’ and angle-of-attack. The information is processed to check for out-of-balance/dangerous flight conditions, then activates a haptic feedback device which generate vibrations to notify the pilot of these flight conditions.

Project Area: Robotics, Mechatronic Systems, Device Design
Project Technology: C/C++
**Project Number: 73**

**Project Title:** Impact of a Bottleneck on the Performance of a Lean Manufacturing System  
**Name:** Liam Faulkner  
**Email:** liam.faulkner2@mail.dcu.ie  
**Programme:** Manufacturing Engineering with Business  
**Supervisor:** John.Geraghty@dcu.ie

Lean manufacturing environments are often controlled by production and inventory control strategies such as kanban control, CONWIP, etc. Or work [tasks] are distributed to stations to balance the line to the desired takt time. The aim of this project is to investigate the impact that a bottleneck would have on such a line. Issues that could be investigated include line length, severity of the bottleneck and recovery time after bottleneck occurrence.

**Project Area:** Lean Manufacturing  
**Project Technology:** Excel/VB, ExtendSIM

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**Project Number: 74**

**Project Title:** Peel Characteristics of medical tapes and adhesives  
**Name:** Conor Gribben  
**Email:** conor.gribben2@mail.dcu.ie  
**Programme:** Biomedical Engineering  
**Supervisor:** Garrett.McGuinness@dcu.ie

This project develops a system for testing the adhesiveness of thin polymer or gel samples to metal or other substrates. The project principally involved the development of an adjustable angle peel test apparatus followed by a programme of tests on bio-materials of interest. A numerical model describing peeling of a soft substrate from a stiff substrate was developed. Bio-materials were then characterised based on mechanical properties.

**Project Area:** Biomedical Engineering  
**Project Technology:** Solidworks, Excel/VB

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**Project Number: 75**

**Project Title:** Loco  
**Name:** Dejan Maksimovic  
**Email:** dejan.maksimovic2@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Gareth.Jones@dcu.ie

Loco is a modern day Android application targeting primarily instant events and real-time postings. Inspired by Foursquare and Snapchat, Loco brings a unique feel and experience to modern day socialising. Loco is built from the ground up to cater for scalability, built on a RESTful microservice architecture in NodeJS and hosted on an EC2 AWS instance. Loco brings advanced Android functionality to users, provides geolocation-based event finding, real-time search capabilities, personalised recommendations and instant notifications.

**Project Technology:** Java, JavaScript, Node.js, Python, REST, NoSQL, XML, ElasticSearch
Project Number: 76
Project Title: Takeaway Direct
Name: Colm Prone
Email: colm.prone2@mail.dcu.ie
Name: Conor Freeman
Email: conor.freeman3@mail.dcu.ie
Programme: Enterprise Computing
Supervisor: Marija.Bezbradica@dcu.ie

Takeaway Direct is a mobile application which provides users with a ‘one stop shop’ for all their takeaway needs, offering a more personalised ordering experience. Takeaway Direct tracks the user’s location and based on their location shows the most popular meal deal/meals in their delivery radius and allows users to order online or call the restaurant directly. Save time on searching different menus, see the most popular meals with one tap.

Project Area: Mobile App
Project Technology: Java

Project Number: 77
Project Title: Analysis of the Effect of varying the acid washing of glass micro-particles on the properties of EmboStasisP uterine fibroid treatment
Name: Sean Sharkey
Email: sean.sharkey5@mail.dcu.ie
Programme: Manufacturing Engineering with Business
Supervisor: Owen.Clarkin@dcu.ie

The Biomaterials Research Group in DCU is currently developing EmboStasisP, a composite hydrogel for the treatment of uterine fibroids. EmboStasisP consists of a polymeric alginate, a novel bioactive glass and glucono-delta-lactone (GDL). This project examines the effect that acid washing the bioactive glass has on the working time, setting time and hardening time as well as on the compressive strength of the composite hydrogel by varying the acid washing time and varying the concentration of the acid solution.

Project Area: Biomedical Engineering
Project Technology: Excel/VB

Project Number: 78
Project Title: Music Transcription
Name: Jerzy Baran
Email: jerzy.baran2@mail.dcu.ie
Programme: Computer Applications
Supervisor: Alistair.Sutherland@dcu.ie

This project investigates the feasibility of note frequency analysis and time-stretching of audio in real-time. The goal of the application is to make it easier for beginner musicians to transcribe piano music from binary audio data to sheet music or any other format of their preference.

Project Area: Graphics, DSP
Project Technology: OpenGL, Fast Fourier Transform, DSP, C/C++
Project Number: 79

Project Title: TeamConnect
Name: Gary Byrne
Email: gary.byrne39@mail.dcu.ie
Programme: Computer Applications
Supervisor: John.McKenna@dcu.ie

TeamConnect is a web application for GAA coaches so they can easily manage their team performances. Each coach can add/edit teams/players, create events such as trainings or matches and generate statistics based on these events. The coach will be shown a live game mode with options to select players and say how they are doing. Reports are then generated from these results. Players are notified of upcoming events via SMS sending.

Project Area: Web Application
Project Technology: Node.js, REST, ExpressJs, MongoDB, JQuery, JavaScript, HTML5, CSS, AngularJS

Project Number: 80

Project Title: Low Modulus PMMA Based Bone Cement for Osteoporotic Bone
Name: Neil Sweeney
Email: neil.sweeney23@mail.dcu.ie
Programme: Biomedical Engineering
Supervisor: Nicholas.Dunne@dcu.ie

Poly(methyl methacrylate) (PMMA) bone cement is currently used in vertebral augmentation procedures such as vertebroplasty and kyphoplasty. Although the use of the cement in these procedures provides pain relief and stability to the fracture site, the cement has a relatively high stiffness compared to the cancellous bone. This mismatch can lead to adjacent vertebral fractures following the procedures. The aim of this project was to reduce the modulus of the bone cement through the addition of agents to the cement.

Project Area: Biomedical Engineering
Project Technology: None

Project Number: 81

Project Title: Self-driving robot using image recognition
Name: Ioana Covic
Email: ioana.covic2@mail.dcu.ie
Programme: Computer Applications
Supervisor: Gareth.Jones@dcu.ie

Toby is an Arduino-based robot able to navigate a maze using its sensors. The Arduino kit integrates with a mobile Android app using serial communication over USB. Toby can follow directions, sense junctions and turn. He uses image recognition for traffic signs and his destination and publishes the route in real-time. The mobile application displays the camera view, robot status and route on a mirroring PC. Toby targets audiences interested in the vast world of robotics and image recognition.

Project Technology: Java, Arduino Programming Language
Project Number: 82

Project Title: Electronic Drum Pad Design
Name: James Kenny
Email: james.kenny24@mail.dcu.ie
Programme: Mechatronic Engineering
Supervisor: Alan.Kennedy@dcu.ie

This project details the design of an electronic drum pad that is inexpensive and reasonably simple to construct. Testing and analysis of the drum is completed to investigate how various factors in the drums design affect the overall performance of the drum pad.

Project Area: Device Design, Mechanical Design and Manufacture, Sensor Technology
Project Technology: Solidworks

Project Number: 83

Project Title: Art-Drop
Name: Iulia Vitca
Email: iulia.vitca2@mail.dcu.ie
Programme: Computer Applications
Supervisor: Gareth.Jones@dcu.ie

Art-Drop is an interactive web application developed using the Spring framework. It aims to fill in the gap between browse and search by tailoring art recommendations specifically to a user’s taste. The application examines popularity data and conjointly explores user preferences to make topical suggestions to users, thus allowing them to continually discover new art pieces, galleries and artists. In addition, Art-Drop acts as a social platform for kindred artists, enabling them to connect and interact with each other.

Project Area: Data Analytics, Model View Controller, Web Application
Project Technology: Eclipse, HTML5, Java, JavaScript, SpringMVC, SQL, XML

Project Number: 84

Project Title: Design and Testing of a Passive Radon Device
Name: Thomas Ryan
Email: thomas.ryan35@mail.dcu.ie
Programme: Mechanical and Manufacturing Engineering
Supervisor: Brian.Corporan@dcu.ie

The aims of this project were to design and test a passive radon device. The device sits on top of a pipe, which in theory would be connected to a radon sump beneath a property. The device accelerates air across a channel in order to create a suction of air from the pipe, which would mitigate radon from dwelling in a sump. The newly-designed device is tested against other passive devices practically, and by using CFD software.

Project Area: Fluid Mechanics, Device Design
Project Technology: ANSYS Workbench, FUENT, Solidworks, Excel/VB
### Project Number: 85

<table>
<thead>
<tr>
<th><strong>Project Title:</strong></th>
<th>Activity Recognition on smartphones using sensor fusion</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Name:</strong></td>
<td>Sean Colgan</td>
</tr>
<tr>
<td><strong>Email:</strong></td>
<td><a href="mailto:sean.colgan@mail.dcu.ie">sean.colgan@mail.dcu.ie</a></td>
</tr>
<tr>
<td><strong>Programme:</strong></td>
<td>Electronic and Computer Engineering</td>
</tr>
<tr>
<td><strong>Supervisor:</strong></td>
<td><a href="mailto:Robert.Sadleir@dcu.ie">Robert.Sadleir@dcu.ie</a></td>
</tr>
</tbody>
</table>

Activity Recognition is a growing field in context-aware computing that deals with automatically recognising human activities based on sensor data. Smartphone devices offer a range of on-board sensors that can be used to determine a performed activity. Previous work has primarily focused on activity category recognition, e.g., walking, running, and still. This project focuses on the recognition of potential sub activities with the goal of developing an Activity Recognition Framework that can be easily configured to recognise new activities.

<table>
<thead>
<tr>
<th><strong>Project Area:</strong></th>
<th>Android, Data Analytics, Sensor Data, Sensor Technology, Software Development</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project Technology:</strong></td>
<td>DSP, Fast Fourier Transform, Java, MATLAB</td>
</tr>
</tbody>
</table>

### Project Number: 86

<table>
<thead>
<tr>
<th><strong>Project Title:</strong></th>
<th>Investigation of high speed radio over fibre distribution systems for future high speed 5G networks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Name:</strong></td>
<td>Sean Moran</td>
</tr>
<tr>
<td><strong>Email:</strong></td>
<td><a href="mailto:sean.moran32@mail.dcu.ie">sean.moran32@mail.dcu.ie</a></td>
</tr>
<tr>
<td><strong>Programme:</strong></td>
<td>Electronic and Computer Engineering</td>
</tr>
<tr>
<td><strong>Supervisor:</strong></td>
<td><a href="mailto:Liam.Barry@dcu.ie">Liam.Barry@dcu.ie</a></td>
</tr>
</tbody>
</table>

This project investigates how 5G networks could be implemented through radio over fibre through a MATLAB simulation. This simulation consists of a multi carrier system transmitter receiver pair which is passed through an optical channel and to observe if it is viable to be a suitable candidate for 5G.

<table>
<thead>
<tr>
<th><strong>Project Area:</strong></th>
<th>Optical Communications, DSP, Software Development, Telecommunications, Wireless Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project Technology:</strong></td>
<td>MATLAB</td>
</tr>
</tbody>
</table>

### Project Number: 87

<table>
<thead>
<tr>
<th><strong>Project Title:</strong></th>
<th>Find Your Doppelgänger</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Name:</strong></td>
<td>Cian McGuinness</td>
</tr>
<tr>
<td><strong>Email:</strong></td>
<td><a href="mailto:cian.mcguinness34@mail.dcu.ie">cian.mcguinness34@mail.dcu.ie</a></td>
</tr>
<tr>
<td><strong>Programme:</strong></td>
<td>Computer Applications</td>
</tr>
<tr>
<td><strong>Supervisor:</strong></td>
<td><a href="mailto:Suzanne.Little@dcu.ie">Suzanne.Little@dcu.ie</a></td>
</tr>
</tbody>
</table>

Find Your Doppelgänger is an Android application that allows users to find people around the world who look like them. The user takes a selfie while registering and then submits the image. The app returns a short list of people [other users] who look like most like him/her. Users are notified when somebody new who looks like them registers with the app in the future.

<table>
<thead>
<tr>
<th><strong>Project Area:</strong></th>
<th>Android</th>
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</thead>
<tbody>
<tr>
<td><strong>Project Technology:</strong></td>
<td>Java, XML</td>
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</tbody>
</table>
Electrospinning has proven an effective and versatile method to produce nanofibres with controlled fibre morphology. Most electrospinning materials are produced in the form of randomly-orientated micro and nano woven mats with low mechanical properties. The aim of this project is to develop and validate a novel conjugate electrospinning rig in order to create highly twisted and highly aligned nanofibre yarns. The incorporation of these well-defined three-dimensional fibrous architectures in more complex structures overcomes many limitations of traditionally electrospun biomaterials.

Project Area: Device Design, Biomedical Engineering, Advanced Material Engineering
Project Technology: Solidworks

This project investigates the noise being produced from a working ball-cock valve as it fills a water tank, with the aim to reduce it. The noise generated as a result of the filling was investigated through the implementation of alternative/new components used as a solution to the problem. The project involved the design of components using SolidWorks which were then 3D printed. The decibel readings were recorded for each alternative concept to analyse the noise reduction.

Project Area: 3D Modelling, Device Design, Fluid Mechanics, Mechanical Design and Manufacture, Thermodynamics
Project Technology: Solidworks

On-Demand Grocery Marketplace is an e-commerce web application. Its architecture consists of a RESTful microservices oriented middle-tier written in Java, using the Spring Boot framework. Its back-end consists of a MongoDB Server running various databases, and its front-end is a web template, following the MVVM (Model View ViewModel) design pattern. The On-Demand Grocery Marketplace serves the foreign food industry, so shops can have an online presence in Ireland.

Project Area: Model View Controller, Web Application, E-commerce, Microservices
Project Technology: CSS, HTML5, Java, JavaScript, JQuery, REST, NoSQL, Spring Boot
**Project Number: 91**

**Project Title:** NearBuy  
**Name:** Ryan McDyer  
**Email:** ryan.mcdyer2@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Cathal.Gurrin@dcu.ie

NearBuy is a platform that allows retailers to advertise time-sensitive deals that are taking place in their stores. These deals are presented to Customers on a map centred on the Customer. Payment is then performed through the Application, presenting a monetisation opportunity.

**Project Area:** Android  
**Project Technology:** Docker, Java, JavaScript, Node.js, REST, NoSQL

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**Project Number: 92**

**Project Title:** Rapid prototyping and validation of next generation wearable sensors for personal health monitoring  
**Name:** Ruairí Barrett  
**Email:** ruairi.barrett26@mail.dcu.ie  
**Programme:** Biomedical Engineering  
**Supervisor:** Dermot.Brabazon@dcu.ie

This project entailed producing 3D models of concept designs for a watch-type platform for sensing sodium levels in sweat. This platform can be used as a primary indicator for Cystic Fibrosis, and for dehydration in elite athletes and firefighters. The project involved 3D printing of prototype designs as well as characterisation of different absorbent materials to be used in the watch as a wicking material. The fluid handling system was also redesigned to incorporate 3D printing technologies.

**Project Area:** 3D Modelling, Device Design, Mechanical Design and Manufacture  
**Project Technology:** MATLAB, Solidworks

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**Project Number: 93**

**Project Title:** Smart meter energy usage statistics  
**Name:** Steven Smith  
**Email:** steven.smith52@mail.dcu.ie  
**Programme:** Electronic and Computer Engineering  
**Supervisor:** Gabriel.Muntean@dcu.ie

This project involves looking at the use of smart meters and the potential significance of smart meter data to increase energy efficiency in the residential sector.

**Project Area:** Energy Conservation, Internet of Things  
**Project Technology:** R, Java, Eclipse, Excel/VB
### Project Number: 94

**Project Title:** Advanced Human Interface Devices (HID) for Flight Simulation Applications  
**Name:** Lukasz Markowski  
**Email:** lukasz.markowski2@mail.dcu.ie  
**Programme:** Electronic and Computer Engineering  
**Supervisor:** Derek.Molloy@dcu.ie  

This project investigates the use of FPGA technology as a cost-effective method to achieve live video overlays to be used for “heads-up” navigation of aircraft and other vehicles. The overlays are used to display data from sensors that are connected to the device. The project also involves building a custom HID device. A Xilinx Zynq platform is being used as the development platform with an Arduino being used as a sensor slave device.

**Project Area:** Automotive Technology, Gaming, Graphics, Image Video Processing, Vehicle Control, Arduino  
**Project Technology:** C/C++, Eclipse, FPGA

### Project Number: 95

**Project Title:** Energy Efficiency for Cleanrooms: Modelling Energy Requirements  
**Name:** Matthew Nulty  
**Email:** matthew.nulty3@mail.dcu.ie  
**Programme:** Mechanical and Manufacturing Engineering  
**Supervisor:** Lorna.Fitzsimons@dcu.ie  

The aim of this project is to investigate the current control strategy and operation of a cleanroom with the aim of reducing the energy consumption while maintaining the desired environmental conditions. The project involves reviewing previous research and finding opportunities for energy savings in the current cleanroom control strategy. The focus of this project is on assessing the efficiency of the chiller unit and reviewing the control logic.

**Project Area:** Energy Conservation  
**Project Technology:** Cylon Active Energy

### Project Number: 96

**Project Title:** It’s Dangerous To Go Alone!  
**Name:** Robert McGrane  
**Email:** robert.mcgrane2@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Renaat.Verbruggen@dcu.ie  

This project is a top down rouge-like procedurally generated game that uses the Unity engine. The game is focused around progressing through a dungeon that is different each time you play, if you get Game Over you must start from the beginning so fresh levels keep the game challenging. The game draws inspiration from older video games. It takes the look and feel of a classic game but with the gameplay of modern rouge-likes mixed in.

**Project Area:** Gaming, Artificial Intelligence  
**Project Technology:** C#
Project Number: 97

Project Title: Isothermal Temperature Control for use with a Squeeze Film Rheometer
Name: Sean Dunniece
Email: sean.dunniece2@mail.dcu.ie
Programme: Mechatronic Engineering
Supervisor: Harold.Esmonde@dcu.ie

This project involves designing, building and testing a temperature control unit for use with a squeeze film rheometer, with the aim of investigating the effect of temperature on the rheological properties of soft solids and liquids.

Project Area: Arduino, Control Systems, Mechatronic Systems, Sensor Data
Project Technology: Arduino

---

Project Number: 98

Project Title: 4D Visualiser
Name: Liam Tuite
Email: liam.tuite3@mail.dcu.ie
Programme: Computer Applications
Supervisor: Liam.Tuohey@dcu.ie

This software provides a visual representation of 4-dimensional geometric objects. The user can select an object to inspect from a given list and customise its properties such as colour and transparency, as well as its rotation. The main use of this program is to provide a currently non-existent interface for displaying higher-dimensional geometry. This can be used by researchers in many branches of mathematics. The project also investigates the potential of abstract functionality in perspective projection in higher dimensions.

Project Area: Graphics
Project Technology: Eclipse, Java

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Project Number: 99

Project Title: External Door Closing Design System
Name: Gerard Moore
Email: gerard.moore25@mail.dcu.ie
Programme: Mechanical and Manufacturing Engineering
Supervisor: Alan.Kennedy@dcu.ie

This project investigates the possible improvements of a door closing device and whether using an alternative designs will enhance the closing time and speed of a door. A door closing model was designed using a mass-weight concept and was assembled. The model was assessed and compared to an existing design using a control analysis program, Simulink. This program accounted for all external factors which contribute to closing speed and time.

Project Area: Device Design, Control Systems
Project Technology: Simulink, MATLAB
Project Number: 100

Project Title: Pre-treatment of fruit waste towards the production of bio methane
Name: Abdulrhman Sabor
Email: abdulrahman.sabor2@mail.dcu.ie
Programme: Manufacturing Engineering with Business
Supervisor: Joseph.Stokes@dcu.ie

With the increasing demand for energy, green renewable energies have recently gained more attention. This project aims to investigate the use of organic waste (fruit waste) to produce biogas. Mechanical pre-treatment was applied to the feedstock used to verify its impact extent in methane production. The conversion technology used in this project is anaerobic digestion (AD) as it’s the most common method for biomass conversion.

Project Area: Renewable Energy Technology
Project Technology: none

Project Number: 101

Project Title: Irish Genealogy Simulation
Name: Ciaran Murphy
Email: ciaran.murphy286@mail.dcu.ie
Programme: Computer Applications
Supervisor: Mark.Humphrys@dcu.ie

This project is a simulation of the history of Ireland, modelling the population and the major events of Irish history to determine the impact they’ve had on the modern day population of the island. The successive waves of British invasion and plantation and the religious barriers created by them are modelled to investigate how different groups integrated into the larger Irish population and how far back the most recent common ancestor of everyone alive in Ireland, excluding recent immigration.

Project Area: Simulation
Project Technology: C/C++

Project Number: 102

Project Title: Statistical Approach to Automatic Video Captioning
Name: David James Gahan
Email: david.gahan7@mail.dcu.ie
Programme: Computer Applications
Supervisor: Alan.Smeaton@dcu.ie

Using off-the-shelf tools available online, this project aims to complete the TRECVID Video to Text challenge. Calls are made to an image tagging API for video frames spaced one second apart. Using machine learning techniques, these are used to generate statistically probable sentences which describe the content of the video.

Project Area: Data Analytics, Image Video Processing
Project Technology: Python
**Project Number: 103**

**Project Title:** Validating Finite Element Models using Photoelasticity  
**Name:** Shane Little  
**Email:** shane.little2@mail.dcu.ie  
**Programme:** Mechanical and Manufacturing Engineering  
**Supervisor:** Bryan.MacDonald@dcu.ie

This project qualitatively validated a series of finite element models using photoelasticity. Photoelasticity is an experimental stress analysis technique that can be used to graphically show stress contours in a loaded structure. An algorithm was created in the finite element software that created a contour plot of stress in the loaded specimen. Both contour plots were compared and the finite element models were altered until they closely matched the stress contour plot obtained using photoelasticity.

**Project Area:** 3D Modelling, Mechanical Design and Manufacture, Photoelasticity  
**Project Technology:** Solidworks, ANSYS APDL

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**Project Number: 104**

**Project Title:** Laser Surface Smoothing of 3D Printed Metal Components  
**Name:** Hatim Barri  
**Email:** hatim.barri2@mail.dcu.ie  
**Programme:** Manufacturing Engineering with Business  
**Supervisor:** Dermot.Brabazon@dcu.ie

Additive manufacturing of metals faces a common problem of producing rough surface objects. This project aims to improve the object’s surface, by analysing and testing the effect of the different parameters of the laser surface smoothing process on stainless steel objects, manufactured by metal additive manufacturing process or selective laser melting.

**Project Area:** Additive Manufacturing  
**Project Technology:** CES

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**Project Number: 105**

**Project Title:** GTT (Project Management Web Application)  
**Name:** James O’Hara  
**Email:** james.ohara5@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Renaat.Verbruggen@dcu.ie

This project’s aim is to integrate project management into the cloud in one unique web application. It combines a social media strength of rapid and efficient communication with optimised and proven project management techniques, centralised in one location that is simple yet sleek from basic projects to complex. This is a unique niche that centralises a project’s data into one location with file sharing. This removes multiple programs needed to fully integrate projects into the cloud, it’s a master key.

**Project Area:** Web Application  
**Project Technology:** Ruby On Rails
### Project Number: 106

**Project Title:** Dashboard for Optimising Data Mining Algorithms  
**Name:** Gareth Neacy  
**Email:** gareth.neacy2@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Mark.Roantree@dcu.ie  

This project is a web application designed to aid data miners. It allows users to upload datasets and run several data mining classification algorithms. Users can tweak algorithm parameters, normalise attributes and apply weights to attributes. Results are displayed to the user indicating which technique works best. Users can save datasets and results and return to where they left off at a later stage.

**Project Area:** Data Mining, Web Application  
**Project Technology:** Node.js, Python, ReactJS Redux MongoDB Material-UI

### Project Number: 107

**Project Title:** Re-design a test rig for the study of an innovative heat engine – Fluid Flow Study  
**Name:** Leslee Augustine Muttathottil  
**Email:** leslee.muttathottil2@mail.dcu.ie  
**Programme:** Mechanical and Manufacturing Engineering  
**Supervisor:** Yan.Delaure@dcu.ie  

The purpose of this project is to develop a lab scale prototype of an innovative heat engine developed by an industrial partner with a view to studying the flow in a small but representative domain. A test rig was designed and built that captures all key characteristics of the real engine. It was used to study the temperature profile and deformation along the engine core in response to heated water flow and to visualise the fluid flow within the engine.

**Project Area:** Mechanical Design and Manufacture, Fluid Mechanics  
**Project Technology:** Computational Fluid Dynamics, Solidworks, Excel/VB

### Project Number: 108

**Project Title:** B.A.N. MT  
**Name:** Conall Malone  
**Email:** conall.malone36@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Andy.Way@dcu.ie  

This project investigates how to build a state-of-the-art adaptive/incremental retrained neural machine translation system so that it can quickly learn knowledge from a new domain and achieve acceptable translation quality.

**Project Area:** Natural Language Processing  
**Project Technology:** Python
This project involves the testing, evaluation, and modeling of a number of low-cost distance sensors for use in autonomous robotic vehicles. The sensors evaluated are two ultrasonic-based and two infrared-based devices. This project covers the development of a testing platform, the implementation of a suitable testing methodology to evaluate sensor performance and ultimately the use of the collected data to form sensor models that can be employed when applying path planning or sensor fusion algorithms to future robotics projects.

**Project Area:** Sensor Technology, Sensor Data, Data Analytics, Embedded Systems, Control Systems, Automotive Technology

**Project Technology:** Simulink, MATLAB, C/C++

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The proposed project will utilise an existing commercial sonicator, in the first instance, to characterise changes in the extrusion behaviour of simple polymeric solutions based on the sonication protocols used and the relevant material properties. The main focus of this project will be the development of a fully instrumented and calibrated rig for this experiment. The objective is to use the combination of experimental and modelling information to define an optimum sonication protocol for extrusion of specific high-viscosity solutions.

**Project Area:** Biomedical Engineering

**Project Technology:** Excel/VB, Solidworks

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The aim of this project is to allow a user to insert their own dataset into the web application and quickly receive useful visual information without major delays. The main goal of this web application is to let a user get insight on the anomalies in his dataset.

**Project Area:** Data Analytics, Web Application

**Project Technology:** AngularJS, HTML5, Node.js, NoSQL, D3.js
<table>
<thead>
<tr>
<th>Project Number: 112</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project Title:</strong> Breathless – A Study of Tension Factors in a 3D First Person Horror Game</td>
</tr>
<tr>
<td><strong>Name:</strong> Hazel Egan</td>
</tr>
<tr>
<td><strong>Email:</strong> <a href="mailto:hazel.egan3@mail.dcu.ie">hazel.egan3@mail.dcu.ie</a></td>
</tr>
<tr>
<td><strong>Programme:</strong> Computer Applications</td>
</tr>
<tr>
<td><strong>Supervisor:</strong> <a href="mailto:Renaat.Verbruggen@dcu.ie">Renaat.Verbruggen@dcu.ie</a></td>
</tr>
</tbody>
</table>

This project investigates which factors produce the highest tension levels during a horror game. I have created a game for PC named ‘Breathless’ in the Unity Game Engine, with the 3D models having been created using Blender 3D Graphics and Animation Software. Different modes have been created such as the addition of music, jump scares and seeing the enemy vs not seeing the enemy to discover what combination of ingredients create the most nerve-racking experience for the player.

| **Project Area:** 3D Modelling, Artificial Intelligence, Gaming |
| **Project Technology:** C# |

<table>
<thead>
<tr>
<th>Project Number: 113</th>
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</thead>
<tbody>
<tr>
<td><strong>Project Title:</strong> Development of Various Implementations of the Simon Block Ciphers</td>
</tr>
<tr>
<td><strong>Name:</strong> Brandon Walsh</td>
</tr>
<tr>
<td><strong>Email:</strong> <a href="mailto:brandon.walsh43@mail.dcu.ie">brandon.walsh43@mail.dcu.ie</a></td>
</tr>
<tr>
<td><strong>Programme:</strong> Electronic and Computer Engineering</td>
</tr>
<tr>
<td><strong>Supervisor:</strong> <a href="mailto:Xiaojun.Wang@dcu.ie">Xiaojun.Wang@dcu.ie</a></td>
</tr>
</tbody>
</table>

This project centres around developing three different implementations of the Simon block cipher using VHDL, and testing these designs as external cryptography modules with a raspberry PI and an FPGA development board. In addition to this, the project includes developing a complete instructional paper on how to implement the cipher in its multiple designs – detailing inner logic and listing extensive test vectors.

| **Project Area:** Cryptography |
| **Project Technology:** VHDL, JavaScript, C/C++ |

<table>
<thead>
<tr>
<th>Project Number: 114</th>
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</thead>
<tbody>
<tr>
<td><strong>Project Title:</strong> Heads-Up No-Limit Texas Hold’em Poker Agent</td>
</tr>
<tr>
<td><strong>Name:</strong> Gianluca Puzzuoli</td>
</tr>
<tr>
<td><strong>Email:</strong> <a href="mailto:gianluca.puzzuoli2@mail.dcu.ie">gianluca.puzzuoli2@mail.dcu.ie</a></td>
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<tr>
<td><strong>Programme:</strong> Computer Applications</td>
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<tr>
<td><strong>Supervisor:</strong> <a href="mailto:David.Sinclair@dcu.ie">David.Sinclair@dcu.ie</a></td>
</tr>
</tbody>
</table>

This project is an easy to use web application that allows users to test their Texas hold’em poker skills against an Artificial Intelligence Agent in a game of Heads-Up No-Limit Texas hold’em poker. Heads-up play is the pinnacle of poker play. The Agent is powered by Counterfactual Regret Minimisation (CFR) and has engaged in days of self-play in order to learn how to play. The question is, man vs machine, do you have what it takes to beat it?

| **Project Area:** Web Application, Artificial Intelligence |
| **Project Technology:** HTML5, Java, CSS, Angular 2 |
**Project Number: 115**

**Project Title:** A Wireless Minibot Network for Coordinated Movement and Positioning  
**Name:** Kenneth Dean  
**Email:** kenneth.dean2@mail.dcu.ie  
**Programme:** Mechatronic Engineering  
**Supervisor:** Jennifer.Bruton@dcu.ie

This project involves the investigation of using a wireless network and a scalable test platform for the coordination of mini mobile robot (minibot) movement. Three minibots are wirelessly controlled by a master connected to a computer. The master coordinates the movements of each minibot from a predetermined starting location and records their position after each movement by using motor feedback data. The results from this test platform are analysed to demonstrate the benefits and challenges of cooperating swarm mobile robots.

**Project Area:** Robotics, Wireless Technology, Vehicle Control, Sensor Data, Mechatronic Systems, Embedded Systems, BeagleBone, Automation  
**Project Technology:** Eclipse, C/C++

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**Project Number: 116**

**Project Title:** V-Chess  
**Name:** Kieran O’Neill  
**Email:** kieran.oneill34@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Andy.Way@dcu.ie

V-Chess is a virtual reality video game based on the classic board game ‘chess’. It utilises Google Cardboard for virtual reality support, paired with Leap Motion sensor for hand tracking. By combining these two pieces of hardware, users can move pieces using their own hands in a virtual environment as if they had a physical board in front of them.

**Project Area:** Virtual Reality  
**Project Technology:** C#
### Project Number: 118

**Project Title:** Real-time Networked Game Engine  
**Name:** Daire O'Bruachail  
**Email:** daire.obruachail2@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** David.Sinclair@dcu.ie

This project is a new concept of collaborative game engine design, allowing for multiple users running different instances of the engine to share changes in level design or object attributes in real-time via a network connection.

**Project Area:** Gaming  
**Project Technology:** C/C++

### Project Number: 119

**Project Title:** The Development of a Hydrogel Heart Valve for Tissue Engineering  
**Name:** Sean Moran  
**Email:** sean.moran33@mail.dcu.ie  
**Programme:** Biomedical Engineering  
**Supervisor:** Tanya.Levingstone@dcu.ie

This project investigates how hyaluronic acid hydrogel performs as a heart valve scaffold and if it shows the potential to be a suitable implantable heart valve replacement. Hyaluronic acid is found within connective, epithelial and neural tissue within the body, and has previously shown potential in bone and tissue engineering applications. Mechanical and degradation tests will be performed on the hydrogel whereby reinforcement fibres will be incorporated within the hydrogel heart valve in order to improve its mechanical properties.

**Project Area:** Biomedical Engineering  
**Project Technology:** Solidworks

### Project Number: 120

**Project Title:** Metal powders and their applications in Selective Laser Melting  
**Name:** Darragh Grehan  
**Email:** darraghgrehan4@mail.dcu.ie  
**Programme:** Biomedical Engineering  
**Supervisor:** Dermot.Brabazon@dcu.ie

Selective Laser Melting (SLM) is a growing field in the additive manufacturing world. SLM can be used to effectively 3D print metal parts layer by layer giving unlimited geometric freedom. The powders used for SLM have to be carefully produced and characterised and this project aims to investigate metal powders used for SLM and the how the properties of the powders used affect the final SLM parts.

**Project Area:** Additive Manufacturing  
**Project Technology:** Powder Metallurgy
Project Number: 121

Project Title: Twilight Photometer
Name: Kacper Koszalka
Email: 12435522@mail.dcu.ie
Programme: Mechatronic Engineering
Supervisor: Harold.Esmonde@dcu.ie

The goal of this project was to build a prototype of a twilight photometer, a device used to measure the concentrations of aerosols in the atmosphere by measuring light intensity from the ground. Part of the design requirement was to investigate the feasibility of mechanical light attenuation to increase the measurement range, and to make the device fully automated and capable of wireless data transmission.

Project Area: Mechatronic Systems
Project Technology: C/C++, Python

Project Number: 122

Project Title: Lens
Name: Ciarán Deegan
Email: ciaran.deegan23@mail.dcu.ie
Programme: Computer Applications
Supervisor: Suzanne.Little@dcu.ie

Lens is an Android app that combines location-based services and augmented reality in an innovative fashion. The app allows users to share their commentary at a location and explore the content shared by others by physically navigating in the direction of markers that populate the Lens map. When close enough to posted content, users can use Lens' augmented reality component to visualise it. Lens is built on the Firebase platform and investigates location search and real-time data, among other concepts.

Project Area: Mobile App, GPS GIS, Android, Augmented Reality
Project Technology: NoSQL, XML, Java

Project Number: 123

Project Title: Thermal Loss Measurement and Analysis
Name: Adam Flanagan
Email: adam.flanagan26@mail.dcu.ie
Programme: Electronic and Computer Engineering
Supervisor: Paul.Whelan@dcu.ie

This project focused on the development of a computer vision system to measure and classify the degree of thermal loss of a building. The thermal images were captured using a FLIR one thermal camera attached to an iPad or iPhone. Captured images were analysed in MATLAB using various image processing and analysis techniques. The thermal measurement data was then correlated along with the buildings BER rating.

Project Area: Image Video Processing
Project Technology: MATLAB
### Project Number: 124

**Project Title:** Brand Analytics for Social Media  
**Name:** Ryan Earley  
**Email:** ryan.earley2@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Ray.Walshe@dcu.ie

This project analyses the branding of companies on social media. It aims to identify the properties of a successful social media marketing campaign. The application looks at elements such as sentiment, phrasing, inclusion of media, hashtags and individuals tagged in posts. It uses these elements to generate a score for the brand’s marketing campaign and offer suggestions on how to improve it. The software identifies key social influences that would help improve marketing campaigns.

**Project Area:** Databases, Data Analytics, Data Mining, Software Development, Social Networking  
**Project Technology:** Python, Kiabana, ElasticSearch, logstash, x-pack

### Project Number: 125

**Project Title:** L2Program  
**Name:** Noel Gallagher  
**Email:** noel.gallagher26@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** John.McKenna@dcu.ie

L2Program is an online platform for novice programmers. The project provides a space for experimentation and learning. Users progress through a series of lessons and problems. The goal of the project is to introduce beginners to programming concepts using a combination of graphics and interactive tools.

**Project Area:** Web Application  
**Project Technology:** MongoDB, Node.js, JavaScript, HTML5, CSS, AngularJS

### Project Number: 126

**Project Title:** Easy Interface CD player for seniors  
**Name:** Ahmed Hassan  
**Email:** ahmed.hassan3@mail.dcu.ie  
**Programme:** Mechatronic Engineering  
**Supervisor:** Alan.Kennedy@dcu.ie

The project is to design and build a CD player for the elderly living with dementia or elderly experiencing weakness in their vision. The CD player contains easy interface touch screen, which is mounted on a mechanical frame allows the user to physically push the screen downwards to select the option.

**Project Area:** RaspberryPi  
**Project Technology:** CSS, JavaScript, PHP, Python
### Project Number: 127

**Project Title:** An investigation into the factors affecting Reddit post popularity  
**Name:** Kevin Gillanders  
**Email:** kevin.gillanders3@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Marija.Bezbradica@dcu.ie

This project aimed to investigate factors affecting popularity of posts on the social media site 'reddit.com' through the use of data mining and analytics methods. These factors were then used to create an integrative predictive model for a post's overall 'score', which was used as a proxy for popularity. Such a model has applications in the creation of viral content, which is highly relevant to effective advertisement on social media.

**Project Area:** Data Analytics, Data Mining, Statistical Analysis  
**Project Technology:** Python, SQL

### Project Number: 128

**Project Title:** Lotto Hub  
**Name:** Adam Purser  
**Email:** adam.purser2@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Darragh.OBrien@dcu.ie

Lotto Hub is a lottery application for Android which caters to players of the Irish National Lottery, Daily Million and Euro Millions. Users can check a ticket by using their device's camera which then extracts the relevant information using OCR. Users can also check current and previous results, view complete prize breakdown and save their favourite numbers.

**Project Area:** Optical Character Recognition, Android, Mobile App, Computer Vision  
**Project Technology:** Java, XML

### Project Number: 129

**Project Title:** A Wireless Intruder System  
**Name:** Avril Hayden  
**Email:** avril.hayden4@mail.dcu.ie  
**Programme:** Electronic and Computer Engineering  
**Supervisor:** Martin.Collier@dcu.ie

This project involves the design and construction of an intruder alarm where all signals are communicated wirelessly from sensors to a central controller. Various network protocols and devices to implement this were investigated. A Raspberry Pi was chosen as the controller, and Zigbee nodes implementing XBee were chosen to communicate sensor readings to it.

**Project Area:** Arduino, Internet of Things, RaspberryPi, Zigbee, Wireless Sensor Technology  
**Project Technology:** XCTU, C/C++
Project Number: 130

**Project Title:** Low-Cost 3-Axis Camera Motion Stabiliser  
**Name:** Amir Al Ghafri  
**Email:** amir.alghafri2@mail.dcu.ie  
**Programme:** Mechatronic Engineering  
**Supervisor:** Derek.Molloy@dcu.ie

The project investigates high-speed techniques for the active stabilisation of a camera to remove distortion caused by camera shake and movement. A prototype hardware platform/rig was designed that demonstrated stabilisation for hand held cameras. The project involved the implementation of control algorithms on low-cost, real-time embedded systems that are capable of controlling motors according to position data that is acquired from sensor devices such as accelerometers and gyroscopes.

**Project Area:** Arduino, Control Systems, Embedded Systems  
**Project Technology:** C/C++

Project Number: 131

**Project Title:** Modelling and Simulation of the MAHA Suspension Test  
**Name:** Mícheál Roddy  
**Email:** micheal.roddy2@mail.dcu.ie  
**Programme:** Mechanical and Manufacturing Engineering  
**Supervisor:** Paul.Young@dcu.ie

The MAHA suspension test is used as part of the Irish NCT to determine the effectiveness of the dampers in a vehicle’s suspension system. This project evaluates the performance of this testing method by modelling and simulating the full scale system using MATLAB and Simulink. A small scale rig was developed using SolidWorks to emulate the test and used to further investigate the behaviour of the system.

**Project Area:** Automotive Technology, Mechanical Design and Manufacture  
**Project Technology:** MATLAB, Simulink, Solidworks

Project Number: 132

**Project Title:** Computer Screen Navigation using Eye Movements  
**Name:** Matthieu Briet  
**Email:** matthieu.briet2@mail.dcu.ie  
**Programme:** Mechatronic Engineering  
**Supervisor:** Ronan.Scaife@dcu.ie

Using a webcam, it is possible to estimate where on a computer screen a person is looking. The aim of this project is to design, construct and calibrate an eye-tracking device capable of identifying the user’s gaze and using that information to control the cursor on a screen. The project explores head-mounted versus desk-mounted cameras and various illumination strategies.

**Project Area:** Computer Vision, Image Video Processing, Motion Analysis  
**Project Technology:** C#
### Project Number: 133

**Project Title:** Friends  
**Name:** Mohammed Al Marhoon  
**Email:** mohammed.almarhoon2@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** David.Gray@dcu.ie

Friends is a social media application for iOS devices. It allows friends create different kinds of events, such as social, sport, culture and many others. From those events, anyone who got invited can see detailed information about the event including a location map, who is coming and who is not. Users of this application can check friends’ locations or events they are going to and can join them. This application makes it easy and faster for friends to hangout together.

**Project Area:** Mobile App  
**Project Technology:** Swift 3, Firebase

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### Project Number: 134

**Project Title:** Parametric Finite Element Modelling of Hip Prosthesis  
**Name:** Benjamin MacCurtain  
**Email:** benjamin.maccurtain2@mail.dcu.ie  
**Programme:** Biomedical Engineering  
**Supervisor:** Bryan.MacDonald@dcu.ie

This project examines the effect the offset and neck angle of a hip prosthesis have on the stresses present in a patient’s femur bone. A 3D Finite Element Model consisting of a standardised femur bone and a DePuy hip prosthesis model was constructed using ANSYS Workbench and SolidWorks in order to measure the different stresses present in the proximal femur bone as a result of the different offset and neck angle values tested.

**Project Area:** Biomedical Engineering  
**Project Technology:** ANSYS Workbench

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### Project Number: 135

**Project Title:** Design and Manufacturing of a Simple Hydroforming Rig to Manufacture Aircraft Structural Components  
**Name:** Naif Alkharusi  
**Email:** naif.alkharusi2@mail.dcu.ie  
**Programme:** Mechanical and Manufacturing Engineering  
**Supervisor:** Bryan.MacDonald@dcu.ie

The objective of this project is to design a simple sheet hydroforming rig and then manufacture it. The rig can be used to shape different aluminium parts such as aircraft structural components. Furthermore, testing methodology will be used to identify the best required pressure or force to successfully deform an aluminium sheet. At the end, this project will assist master degree students in Dublin City University to build finite element model of process.

**Project Area:** Mechanical Design and Manufacture  
**Project Technology:** .NET
Project Number: 136

Project Title: Design, Manufacture, and Testing of a Continuous Water Jet for Dissection Based Surgical Procedures
Name: Daniel Breen
Email: daniel.breen22@mail.dcu.ie
Programme: Mechatronic Engineering
Supervisor: Garrett.McGuinness@dcu.ie

This project investigates the design, manufacture and assembly of a surgical-based water jet system for dissection procedures. The project involves the mechanical design and manufacture of the pumping system, nozzle assembly and testing rig. The system is digitally controlled using a microcontroller which also records sensory data from two flow meters and a pressure sensor. Multiple tests were carried out to prove the capabilities of the system and a liver substitute gel was tested to further prove the system’s capabilities.

Project Area: Sensor Data, 3D Modelling, Biomedical Engineering, Device Design, Fluid Mechanics, Mechanical Design and Manufacture, Mechatronic Systems
Project Technology: Solidworks, C/C++

Project Number: 137

Project Title: Real-time Video Stabilisation using the PYNQ ARM/FPGA Platform
Name: Chris Holmes
Email: christopher.holmes3@mail.dcu.ie
Programme: Electronic and Computer Engineering
Supervisor: Derek.Molloy@dcu.ie

The aim of this project is to remove unwanted camera shake from live video streams using real-time image processing techniques along with sensor fusion on the PYNQ, Zynq-based ARM/FPGA embedded platform. The design used in this project takes advantage of the programmable logic of the multi-platform System-on-a-Chip for real-time image processing and interfacing to the electronic sensors.

Project Area: Image Video Processing, Motion Analysis, Sensor Technology
Project Technology: C/C++, Python

Project Number: 138

Project Title: Examination of the effect of the laser surface treatment for reflective satellite coatings
Name: Sulaiyam Alshukairi
Email: sulaiyam.alshukairi2@mail.dcu.ie
Programme: Mechanical and Manufacturing Engineering
Supervisor: Dermot.Brabazon@dcu.ie

Mixed samples of aluminium and titanium (coated with either solar black or zinc phosphate) were given by a company called Enbio. The objective was was to examine the effect of laser on these special coatings. The desired result was to get great adhesion and a strong bonding between the coating itself and the metal substrate. Hence, aiming to heat the coating with laser without damaging or destroying it.

Project Area: Advanced Material Engineering
Project Technology: PLC Programming, Excel/VB
Project Number: 139

Project Title: Investigation of Control Techniques for Buck Converters
Name: Sandra Kuttivelil Joy
Email: sandra.kuttiveliljoy2@mail.dcu.ie
Programme: Mechatronic Engineering
Supervisor: Marissa.Condon@dcu.ie

This project investigates control techniques for a buck converter. The converter and control circuits are simulated to illustrate bifurcations due to changes in the input voltage. Linear and sinusoidal ramps are considered. The effect of feedforward control is investigated. An experimental setup of the buck converter is implemented to compare results with the simulated studies.

Project Area: Power Electronics
Project Technology: MATLAB

Project Number: 140

Project Title: Woodlands
Name: Christopher Hurley
Email: christopher.hurley25@mail.dcu.ie
Programme: Computer Applications
Supervisor: Renaat.Verbruggen@dcu.ie

Woodlands is a 2D action platforming game developed with Unity. The project aims to create a fun and unique platforming experience by letting the player swap between three characters (each with different attributes), fight enemies, pick up collectibles and explore a number of levels. Race to finish each level with the best score and time that you can!

Project Area: Gaming
Project Technology: C#

Project Number: 141

Project Title: A desktop CNC milling machine for demonstration and open day purposes
Name: Diarmuid Kelleher
Email: diarmuid.kelleher27@mail.dcu.ie
Programme: Mechatronic Engineering
Supervisor: Tamas.Szecsi@dcu.ie

The proposed project was to design and develop a desktop computer numerically controlled milling machine comparable to those on the market today while becoming lighter and more portable without compromising accuracy or robustness. The resultant device will be used to showcase engineering principles and demonstrate practical manufacturing processes live in a classroom environment.

Project Area: Mechatronic Systems, Educational, Mechanical Design and Manufacture
Project Technology: Solidworks
Project Number: 142

Project Title: Design and build a test rig for the study of a reciprocating pump – Project I design of linear motion system

Name: Sultan Mohammed Said Al Maawali
Email: sultan.almaawali2@mail.dcu.ie
Programme: Mechanical and Manufacturing Engineering
Supervisor: Yan.Delaure@dcu.ie

The main objective of this project is to design and build a system capable of replicating the linear motion of a piston. The application under investigation is a positive displacement pump with a spring loaded valve whose design must be optimised. The prototype will be used to investigate pressure fluctuations induced by the valve opening. The design and partial built were completed according to specifications and further modifications have been suggested to accommodate the low torque of a selected motor.

Project Area: Device Design
Project Technology: none

Project Number: 143

Project Title: Piping Systems Dead Leg Analysis

Name: Ross Cullen
Email: ross.cullen22@mail.dcu.ie
Programme: Mechanical and Manufacturing Engineering
Supervisor: Brian.Corcoran@dcu.ie

This project investigates a number of different ratios of dead leg length to diameter to determine the temperature difference between the base of a dead leg and that of the pipe network. A rig was used to simulate a pipe network and water storage tank and tests were run to gather data with the aim of suggesting the best ratio of length to diameter to ensure the dead leg reaches the same temperature as that of the pipe network.

Project Area: Fluid Mechanics
Project Technology: Pico Log Recorder

Project Number: 144

Project Title: Lucky Hour

Name: Stuart McCluskey
Email: stuart.mccluskey4@mail.dcu.ie
Name: Luke O’Riordan
Email: luke.oriodan3@mail.dcu.ie
Name: Michael Omodele
Email: michael.omodele2@mail.dcu.ie
Programme: Enterprise Computing
Supervisor: Marija.Bezebrical@dcu.ie

Our service aims to offer a personalised gambling experience by connecting users to physical casinos with the intention of increasing footfall in casinos. This will be done through a multi-sided platform, informing the users on when best to visit the casino, special offers, etc. Our users are everyday people and also clients such as bookmakers and medium-sized casinos.

Project Area: Mobile App
Project Technology: JavaScript, SQL
**Project Number: 145**

**Project Title:** ViewPoint  
**Name:** Raphaelle Smyth  
**Email:** raphaelle.smyth27@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Brian.Stone@dcu.ie

ViewPoint is a web application allowing employees from large-scale companies to view, upload and apply to collaborate on innovative project ideas. It encourages cross-division and cross-office teamwork. People within the company can use it to reach out to colleagues knowing their skills and interests match their project. It collects and displays project information transparently using a visual quiddiagram. This allows employees to apply to work on tasks that interest them. It also aims to avoid idea duplication.

**Project Area:** Web Application  
**Project Technology:** AngularJS, CSS, HTML5, Java, JavaScript, Node.js

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**Project Number: 146**

**Project Title:** An Investigation of Off-Chip and On-Chip Sensor Fusion Solutions for Position and Orientation Estimation  
**Name:** Aidan Smyth  
**Email:** aidan.smyth36@mail.dcu.ie  
**Programme:** Electronic and Computer Engineering  
**Supervisor:** Jennifer.Bruton@dcu.ie

This project investigates off-chip sensor fusion approaches to compete with the performance and cost of available on-chip sensor fusion solutions. Sensor fusion is the use of software-based methods to combine data from several sensors to improve the overall sensor system performance. This project combines gyroscope, accelerometer and magnetometer sensor data. Sensor fusion algorithms such as the Complementary filter and Kalman filter estimate the orientation of the sensor system in real-time. Results from different sensor fusion schemes are compared and contrasted.

**Project Technology:** Processing, Arduino, MATLAB, Excel/VB, C/C++

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**Project Number: 147**

**Project Title:** Development and testing of a true random number generator  
**Name:** Kevin Harrington  
**Email:** kevin.harrington4@mail.dcu.ie  
**Programme:** Mechatronic Engineering  
**Supervisor:** Conor.McArdle@dcu.ie

The objective of this project was to design, build and test a cost-effective true random number generator, which can generate “high-quality” random numbers at a high rate. This was achieved by creating a source of noise, which was generated by a zener diode. This noise was then sampled on a Teensy 3.2 microcontroller. The numbers that were generated were then tested for correlation using MATLAB and Excel.

**Project Area:** Arduino, Circuit Modeling, Cryptography  
**Project Technology:** DSP, Excel/VB, MATLAB
### Project Number: 148

**Project Title:** OCR Accounting Application  
**Name:** Daniel Maguire  
**Email:** daniel.maguire28@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Alistair.Sutherland@dcu.ie

The purpose of this application is to allow users to monitor their spending habits on a day-to-day basis and gain control over their income. This application has been developed to capture receipt/invoice data and store it in an online database. The application takes advantage of tesseract optical character recognition technology while applying error correcting algorithms for smoother input to capture obscured images.

**Project Area:** Software Development, Image Video Processing, Optical Character Recognition, Mobile App, Android  
**Project Technology:** Java, NoSQL

### Project Number: 149

**Project Title:** Development of a Composite Hydrogel with Improved Radiopacity for the Treatment of Cerebral Aneurysms  
**Name:** Eoghan Boyne  
**Email:** eoghan.boyne2@dcu.ie  
**Programme:** Manufacturing Engineering with Business  
**Supervisor:** Owen.Clarkin@dcu.ie

This project involves formulating, as well as mechanical and rheological testing on a novel hydrogel composite with improved radiopacity for the treatment of cerebral and abdominal aortic aneurysms. This novel formulation is based on EnduraGel with the added inclusion of tantalum oxide particle and potassium iodide for improved radiopacity. These novel formulations are then compared to the original formulation in terms of mechanical integrity and rheological properties.

**Project Area:** Biomedical Engineering  
**Project Technology:** Excel/VB

### Project Number: 150

**Project Title:** Modelling of Bolted Joints Using Finite Element Analysis  
**Name:** Shane Patton  
**Email:** shane.patton3@mail.dcu.ie  
**Programme:** Mechanical and Manufacturing Engineering  
**Supervisor:** Bryan.MacDonald@dcu.ie

This project investigates modelling bolted joints using finite element analysis. Several different models were evaluated and compared against theoretical calculations. Each of the models were evaluated under a number of different load conditions to test their suitability in each case. The objective of this project is to find suitable approximations of bolted joints to reduce modelling and computing time when carrying out larger studies.

**Project Area:** Finite Element Analysis  
**Project Technology:** Ansys Mechanical
Project Number: 151

Project Title: Mixing fruit waste to enhance the quality of the bio-gas
Name: Johnathan McGuigan
Email: johnathan.mcguigan2@mail.dcu.ie
Programme: Mechanical and Manufacturing Engineering
Supervisor: Joseph.Stokes@dcu.ie

The aim of this project is to use fruit waste as biomass material to investigate and optimise the production of bio-methane. Fruit waste usually comes with different types of fruits. The aim of this study is to find the optimal process settings for both the pre-treatment and the anaerobic digestion (AD) processes in order to obtain the optimum yield and concentration of the bio-gas produced. DOE techniques are used here to determine the relationship and to optimise the processes.

Project Area: Renewable Energy Technology
Project Technology: Design Expert, Excel/VB

Project Number: 152

Project Title: Cloakroom
Name: Aimée McDonnell
Email: aimee.mcdonnell47@mail.dcu.ie
Name: Adam Ennis
Email: adam.ennis22@mail.dcu.ie
Programme: Enterprise Computing
Supervisor: Suzanne.Little@dcu.ie

Cloakroom is a mobile application that will revolutionise the way cloakrooms operate by allowing the end user to check their coat or bag into a cloakroom without any cash, tickets or queues. Cloakroom aims to make the process of checking in an item as quick and simple as possible. Using QR codes, the cloakroom operator simply scans the users phone to check in or to retrieve their belongings, while being kept informed via notifications.

Project Area: Android, Mobile App
Project Technology: Java, PHP, SQL, QR Codes

Project Number: 153

Project Title: OCR Sudoku Solver
Name: Luke O’Regan
Email: luke.oregan4@mail.dcu.ie
Programme: Computer Applications
Supervisor: Suzanne.Little@dcu.ie

OCR Sudoku solver is a desktop application that uses computer vision to read in and solve Sudoku puzzles. User interact with the system by holding up a puzzle to the computers webcam or by inputting an image file to the system. After the Sudoku solver has identified the Sudoku grid it uses machine learning to identify both printed and handwritten numbers within it. The system will then efficiently solve the puzzle and return the correct solution to the user.

Project Area: Computer Vision, Image Video Processing, Optical Character Recognition, Machine Learning
Project Technology: Python, OpenCV
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Design and manufacture of a demonstration rig, which can be used as a teaching aid in undergraduate classes. This compact and manually operated device clearly demonstrates the cutting parameters associated with the manufacturing process of turning.

- **Project Area:** Mechanical Design and Manufacture
- **Project Technology:** Solidworks

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The objective of the project was to characterise the reverse osmosis process, to identify key performance parameters and to optimise system operation.

The steps taken were:
1. A review of relevant literature and existing system designs
2. Study the system and identify key performance parameters
3. Model, test and validate the system in ROSA software
4. Optimise the operation of the system

- **Project Area:** Water Treatment
- **Project Technology:** Reverse Osmosis System Analysis [ROSA]

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This application is a tool that allows users to simulate traffic flow through various junctions. This would be a very useful tool for public authorities responsible for traffic congestion in major cities and anyone interested in Traffic Simulation. The application has a wide range of settings which enables users to be creative. Real-time data analyses and a post simulation report allows users analyse and improve their work. Tired of the traffic congestion in your local area? GENERATE, SIMULATE, IMPROVE.

- **Project Area:** Artificial Intelligence, Software Development, 3D Simulation
- **Project Technology:** C#, Unity
**Project Number: 157**

**Project Title:** My Guide Dogs Dane  
**Name:** Kok Heng Chan  
**Email:** kok.chan2@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Mark.Roantree@dcu.ie

This project is an orientated-aid Android mobile application to retrieve and locate a real-time information via Global Positioning System with step-to-step instruction provided by text-to-speech announcement.

**Project Area:** GPS GIS  
**Project Technology:** Java

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**Project Number: 158**

**Project Title:** Aluminium Surface Texturing for Improved Interference Fit Control  
**Name:** Donal Kilcullen  
**Email:** donal.kilcullen2@mail.dcu.ie  
**Programme:** Mechanical and Manufacturing Engineering  
**Supervisor:** Dermot.Brabazon@dcu.ie

Interference fits typically operate via high-precision machining of a pipe and hub section. In this project, a new method of laser texturing the interference fit has been investigated. The laser texturing is achieved by scanning the part beneath a laser beam to achieve localised melting of the material surface. The effect of the laser process parameters on the resulting micro-texture and bond strength will be examined using design of experiments methodology, by measuring the RA value and tensile strength.

**Project Area:** Advanced Material Engineering  
**Project Technology:** Design Expert

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**Project Number: 159**

**Project Title:** Park At  
**Name:** Michael McGlynn  
**Email:** michael.mcglynn3@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Suzanne.Little@dcu.ie

This project uses a Python backend framework Django with a SQL database and Bootstrap frontend. The project uses available data summarise Parking Data on an interactive google map.

**Project Area:** Web Application, Data Analytics, Databases  
**Project Technology:** CSS, JavaScript, Python, REST, SQL
### Project Number: 160

**Project Title:** Improveme.ie  
**Name:** Scott Mooney  
**Email:** scott.mooney6@mail.dcu.ie  
**Name:** Alexandru P Lapusneanu  
**Email:** alexandru.lapusneanu2@mail.dcu.ie  
**Programme:** Enterprise Computing  
**Supervisor:** Rory.OConnor@dcu.ie  

This project is an internet-based platform that advertises the sale of expert services for various skills like languages, musical instruments and crafts. The website allows users to browse through Tutor/Expert profiles within their area, so that they can avail of their services with ease. This is aimed at the older generation of 40- to 60-year-old adults, who are looking to better improve themselves in their spare time. The website created and linked database allows us to provide this service.  

**Project Area:** Web Application  
**Project Technology:** Java, SQL, HTML5

### Project Number: 161

**Project Title:** Gymnatic – Train With Intelligence  
**Name:** Aaron Daly  
**Email:** aaron.daly42@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Ray.Walshe@dcu.ie  

Gymnatic provides an intelligent gym experience through a user-oriented, simplistic mobile application. It gives users the ability to create and log workouts, track cardio sessions and compete against configurable bots to induce a sense of competitiveness in their training. Deep data analytics gives users insight into their performance, helping them to fine-tune their training and achieve their goals.  

**Project Area:** Mobile App, Data Analytics  
**Project Technology:** React-Native, Redux, Firebase, Node.js, JavaScript, ES6

### Project Number: 162

**Project Title:** Home Run Bus  
**Name:** Jack Holsgrove  
**Email:** jack.holsgrove2@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Alan.Smeaton@dcu.ie  

This project is an improvement to a bus simulator set up for elderly residents in a care home. Using a triple monitor set up, footage is being played of a bus trip for the residents. It is being used for treatment management for people with dementia. There are several improvements made to the system, such as synchronising footage playback, multiple route storage and a means of pausing playback for the users without impacting the immersive experience for the users.  

**Project Area:** Software Development  
**Project Technology:** Java
### Project Number: 163

**Project Title:** Inverted Pendulum on a Cart  
**Name:** Mitchell Ewulonu  
**Email:** mitchell.ewulonu2@mail.dcu.ie  
**Programme:** Mechatronic Engineering  
**Supervisor:** Tony.Holohan@dcu.ie

This project investigates the control and stabilisation of an inverted pendulum on a cart. Similar to trying to balance a broom stick, the primary objective of the project is to maintain the cart at a fixed position while keeping the pendulum at an upright position. The Inverted pendulum is a classical problem, which demonstrates how an open loop system can be stabilised through feedback. The control techniques explored include LQR (Linear Quadratic Regulation) and PID (Proportional Integral Derivative).

**Project Area:** Control Systems, Mechatronic Systems, Arduino  
**Project Technology:** MATLAB, Simulink

### Project Number: 164

**Project Title:** Hand Mobility Monitoring and Analysis  
**Name:** Richard Carragher  
**Email:** richard.carragher2@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Donal.Fitzpatrick@dcu.ie

This project uses a Leap Motion controller to track hand movements through a series of games designed to help hand mobility. These games allow for real-time feedback on how users are progressing through an exercise and if they are archiving their goals. Analysis of the hand tracking allows for a record of progression to be recorded for care providers to create reports that can contain a mixture of both tables and graphs along with their own commentary of results.

**Project Area:** Sensor Data  
**Project Technology:** AngularJS

### Project Number: 165

**Project Title:** Blockchain voting  
**Name:** Michael Wall  
**Email:** michael.wall22@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** David.Gray@dcu.ie

This project is a proof of concept for an electronic voting system which implements a blockchain database and cryptography to provide anonymity, tamper free ballots and ease of tallying the votes.

**Project Area:** Cryptography, Distributed Systems, Software Development, Voting  
**Project Technology:** Go
Project Number: 166

Project Title: Experimental Dynamic Protocol for the Simulation of Spinal Burst Fractures
Name: Martina O’Malley
Email: martina.omalley24@mail.dcu.ie
Programme: Biomedical Engineering
Supervisor: Nicholas.Dunne@dcu.ie

This project aims to design, develop and validate a reliable test rig that can generate a thoracolumbar burst fracture. The test rig implements a “drop weight” technique where a known weight is dropped from a known height onto the sample. The kinetic and potential energies required to cause a burst fracture may be determined. By mimicking a naturally occurring fracture, several tests may be performed to understand the relationship between experimental test parameters and the type of spinal fracture introduced.

Project Area: Biomedical Engineering
Project Technology: Solidworks

Project Number: 167

Project Title: Development of an Improved Drive System for the Greenpower Challenge
Name: Bryan Goodson
Email: bryan.goodson2@mail.dcu.ie
Programme: Mechanical and Manufacturing Engineering
Supervisor: Paul.Young@dcu.ie

This project developed a Continuous Variable Transmission (CVT) system that can optimise the gear ratio, to maximise the distance travelled using a single battery charge. The electrical control of the motor is a simple on-off relay, which will draw significant current on start-up. The addition of a soft start is used to reduce the current drawn on start-up. This project required some experimentation to understand the characteristics of the motor and transmission.

Project Area: Mechanical Design and Manufacture, Automotive Technology, 3D Modelling
Project Technology: Solidworks, Excel/VB

Project Number: 168

Project Title: Marketing, Sponsorship and Web-Site Development for the Siemens Greenpower Car Challenge
Name: Jamie Goodhart
Email: jamie.goodhart2@mail.dcu.ie
Programme: Manufacturing Engineering with Business
Supervisor: Brian.Corcoran@dcu.ie

The Greenpower Education Trust’s competition is an electric car challenge which requires students, guided by DCU, to design, build and then race an electric car. This project involves liaison with the school teams and the main objectives include the design of a website to promote the Greenpower car challenge, linking with DCU’s communications and marketing team to promote activities during the year and making frequent school visits and promotion at open days and other events during the academic year.

Project Area: Social Networking
Project Technology: not relevant
Project Number: 169

Project Title: Development of a low mass chassis for the GreenPower Challenge
Name: Colm Kelly
Email: colm.kelly237@mail.dcu.ie
Programme: Mechanical and Manufacturing Engineering
Supervisor: Paul.Young@dcu.ie

This project investigates the structural integrity of a kit car chassis and develop it to reduce the overall mass. The new design improves the existing chassis in terms of performance through stiffness, rigidity and weight. Through finite element modelling, different types of analyses were performed on the existing chassis to investigate the optimum design. The new design exploits any deficiencies and outperforms the existing model.

Project Area: Mechanical Design and Manufacture
Project Technology: Solidworks

Project Number: 170

Project Title: VR Puzzle Game
Name: Patrick Mulvaney
Email: patrick.mulvaney5@mail.dcu.ie
Programme: Computer Applications
Supervisor: David.Sinclair@dcu.ie

This project is a virtual reality puzzle game. It was developed for Windows systems in the Unity3D engine and is played using the HTC Vive headset. The player is a detective in the Wild West who must solve a missing persons case. Using the VR headset, motion controls and room-scale VR, the player can fully interact with the environment. Using clues and objects they pick up, they must solve puzzles and interrogate suspects to get to the bottom of the mystery.

Project Area: Gaming
Project Technology: C#
<table>
<thead>
<tr>
<th>Project Number</th>
<th>Project Title</th>
<th>Name</th>
<th>Email</th>
<th>Programme</th>
<th>Supervisor</th>
</tr>
</thead>
<tbody>
<tr>
<td>172</td>
<td>Manufacture of an Artificial Hand using Fibre-Reinforced Actuators</td>
<td>Austin Fanning</td>
<td><a href="mailto:austin.fanning4@mail.dcu.ie">austin.fanning4@mail.dcu.ie</a></td>
<td>Biomedical Engineering</td>
<td><a href="mailto:Jeremiah.Murphy@dcu.ie">Jeremiah.Murphy@dcu.ie</a></td>
</tr>
</tbody>
</table>

The field of soft robotics has become highly prominent in recent years, large ranges of natural movements can be easily created by mechanical programming inflatable elastomers with strain limiting components. Soft actuators offer the advantages of highly compliant structures with rapid prototyping capabilities and significantly lower financial costs. The project goals were to build a mechanically programmed artificial hand using the fibre-reinforced soft actuator in conjunction with the Soft Robotics Toolkit and investigate the effectiveness of different actuator designs.

**Project Area:** Biomedical Engineering, Robotics  
**Project Technology:** Solidworks

<table>
<thead>
<tr>
<th>Project Number</th>
<th>Project Title</th>
<th>Name</th>
<th>Email</th>
<th>Programme</th>
<th>Supervisor</th>
</tr>
</thead>
<tbody>
<tr>
<td>173</td>
<td>Face Recognition System</td>
<td>Jordan Healy</td>
<td><a href="mailto:jordan.healy36@mail.dcu.ie">jordan.healy36@mail.dcu.ie</a></td>
<td>Computer Applications</td>
<td><a href="mailto:Alistair.Sutherland@dcu.ie">Alistair.Sutherland@dcu.ie</a></td>
</tr>
</tbody>
</table>

This “Face Recognition System” will be a web application tool used for both students for educational purposes and for business for institutional use. The goal is to compare and contrast three different face recognition algorithms in the context of speed, accuracy and description. Whilst also having the purpose of being implemented within businesses for security reasons.

**Project Area:** Image Video Processing, Web Application  
**Project Technology:** Java, SpringMVC, ClojureScript

<table>
<thead>
<tr>
<th>Project Number</th>
<th>Project Title</th>
<th>Name</th>
<th>Email</th>
<th>Programme</th>
<th>Supervisor</th>
</tr>
</thead>
<tbody>
<tr>
<td>174</td>
<td>Testing and optimisation of a water treatment system (membrane distillation)</td>
<td>Karl Devereux</td>
<td><a href="mailto:karl.devereux3@mail.dcu.ie">karl.devereux3@mail.dcu.ie</a></td>
<td>Mechanical and Manufacturing Engineering</td>
<td><a href="mailto:Lorna.Fitzsimons@dcu.ie">Lorna.Fitzsimons@dcu.ie</a></td>
</tr>
</tbody>
</table>

The aim of this project is to investigate the water treatment system, membrane distillation. Offering proposals for optimisation techniques in relation to key parameters, such as temperature and water flow rates. Reviewing its viability as an energy efficient alternative to other distillation methods and suggesting possible areas of use.

**Project Area:** Energy Conservation, Water Treatment  
**Project Technology:** Excel/VB, Design Expert, Membrane Distillation
### Project Number: 175

**Project Title:** Machine Translation Portal  
**Name:** Owen Lennon  
**Email:** owen.lennon4@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Andy.Way@dcu.ie  

The ADAPT Centre’s MT group require the development of a web-based data portal, where contributors can upload their data through a simple, easy to use process. The portal functions will include validation checks for the file formats. The portal’s front end is implemented with Angular 2 and the portal’s back end is implemented using a Python framework called Flask. The two services will interact through REST, communicating over HTTP – making requests to specific URLs.

**Project Area:** Databases, Mobile App, Web Application  
**Project Technology:** AngularJS, Python, SQL

### Project Number: 176

**Project Title:** Automated Invoice System  
**Name:** Oisin Costello  
**Email:** oisin.costello5@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Jane.Kernan@dcu.ie  

This project is a system to compile all the fees for a client and automatically create an invoice to be sent out at the end of each month. The system consists of a SQL Server database, an asp.net MVC web application and a Web API. The web application allows the user to view and manage generated invoices, view sales and performance over time and provides client management and support features.

**Project Area:** Automation, Model View Controller, Web Application  
**Project Technology:** .NET, C#, SQL

### Project Number: 177

**Project Title:** Design a THz Transmission line  
**Name:** Steven Flynn  
**Email:** steven.flynn27@mail.dcu.ie  
**Programme:** Electronic and Computer Engineering  
**Supervisor:** Pascal.Landais@dcu.ie  

The aim of this project is to design a wireless transmitter and receiver which can send and receive a THz signal with interference from simulated common, real world sources. I shall be designing this link between the optical and RF frequency ranges. The main source of interference I will be focused on will be the effect of water absorption at different altitudes and the length of the link. Some possible uses for THz frequencies include medical scanning and information communications.

**Project Area:** Telecommunications  
**Project Technology:** MATLAB
Project Number: 178

Project Title: Home Monitoring Fall Detection and phone alerts
Name: Eóin O’Friel
Email: eoin.ofriel2@mail.dcu.ie
Programme: Computer Applications
Supervisor: Cathal.Gurrin@dcu.ie

This project uses a Raspberry Pi and camera to process images from a camera in real-time with OpenCV, to detect if the movement a person makes is a fall. Text notifications are sent to trusted individuals if a fall is detected. Temperature and humidity data is also taken from the room being monitored and displayed in a companion app.

Project Area: Image Video Processing, Mobile App, RaspberryPi, Sensor Data
Project Technology: Java, PHP, Python

Project Number: 179

Project Title: Live a-Side
Name: Niall Fitzpatrick
Email: niall.fitzpatrick23@mail.dcu.ie
Name: Saul Carolan
Email: sol.ocearlain3@mail.dcu.ie
Programme: Enterprise Computing
Supervisor: Jane.Kernan@dcu.ie

Live a-Side is a sports organisation and management system, consisting of a mobile application and a web application. The mobile app simplifies the organisation of games and provides a platform for users to book the use of sports facilities through its unique timetabling feature. The web app serves as a booking management system for sports facilities and provides data analytics for owners to make more educated business decisions. It’s your sport – you decide the time, you decide the place.

Project Area: Android, Databases, Data Analytics, Mobile App, Social Networking, Web Application
Project Technology: CSS, HTML5, Java, JavaScript, PHP, SpringMVC, SQL, Bootstrap

Project Number: 180

Project Title: The design of collagen coatings for drug and growth factor delivery
Name: Ciaran Griffin
Email: ciaran.griffin33@mail.dcu.ie
Programme: Biomedical Engineering
Supervisor: Tanya.Levingstone@dcu.ie

This project involves designing collagen coatings to be coated upon medical implants. Implants can be coated with collagen coatings to enable a localised delivery of drugs and growth factors to minimise the risk of infection and promote healing and growth around the implant site. The collagen coatings were tested in terms of their drying time, their surface roughness, their surface profile and their adhesion strength. Reducing the pH of the collagen slurry before making resulting coatings was also explored.

Project Area: Tissue Engineering, Advanced Material Engineering
Project Technology: Excel/VB
Project Number: 181

Project Title: Lesson creation tool
Name: Eoin Ffrench
Email: eoin.ffrench2@mail.dcu.ie
Programme: Computer Applications
Supervisor: Gareth.Jones@dcu.ie

The complexities of trying to teach a lesson can be lessened somewhat by breaking it down into its smallest parts. Educators are always looking for new ways to share lessons with students. Using the computer lesson creator teachers can break their lesson up into parts in order for their students to download and view. Their lessons can include audio, video, text and interactive slides. These lessons can then be viewed on a computer or on an Android device.

Project Area: Android
Project Technology: Java

Project Number: 182

Project Title: Prototype Electronic Drum Tester
Name: Edward Byrne
Email: edward.byrne55@mail.dcu.ie
Programme: Mechatronic Engineering
Supervisor: Alan.Kennedy@dcu.ie

This project consisted of the development of a prototype device that could test the use of electronic drums and how the use of different materials within the drum could dissipate the energy acquired by the striking of the drumstick. The project made use of several principles of engineering from project management to design and finally to implementation and testing. The project looked at using advanced technology such as 3D printing to produce alternative methods for damping the output signal.

Project Area: Automation
Project Technology: MATLAB, Solidworks

Project Number: 183

Project Title: App Of All Trades
Name: Conor Moran
Email: conor.moran49@mail.dcu.ie
Programme: Computer Applications
Supervisor: Jane.Kernan@dcu.ie

App Of All Trades is an Android application that serves to provide the public with the means of locating and requesting the services of tradesmen and women in their vicinity. Customers specify what sort of service they need and when, where they will then receive a map of local workers of that trade. It is essentially a Hailo app for tradespeople to find work, and for the public to find the right help for the job they need completed.

Project Area: Android
Project Technology: HTML5, Java, JavaScript, Node.js, SQL
Project Number: 184

Project Title: DCU Navigator
Name: Brian Bonfil
Email: brian.bonfil2@mail.dcu.ie
Programme: Computer Applications
Supervisor: Paul.M.Clarke@dcu.ie

DCU Navigator is an Android application that will allow new students and guests find their way around the DCU Glasnevin Campus. Users can navigate their way between different buildings and search for room locations through an interactive map.

Project Area: Android, GPS GIS
Project Technology: Java, JavaScript, Node.js, REST, XML

Project Number: 185

Project Title: Building an IoT Automated Triage System using NodeMCU
Name: Ciaran McNally
Email: ciaran.mcnally7@mail.dcu.ie
Programme: Electronic and Computer Engineering
Supervisor: Noel.Murphy@dcu.ie

This project looks at creating an IoT-based support to the triage process. Several sensors are interfaced to a NodeMCU, creating a sensor network. This sensor network would be fitted to a patient waiting in an A&E department and would gather relevant health data on the patient. This data would then be sent over WiFi to a central computer that analyses the incoming data, generates an action list in real-time and flags if a patient’s health is deteriorating while waiting.

Project Area: Internet of Things, Sensor Data
Project Technology: C/C++, NodeMCU

Project Number: 186

Project Title: Intro to programming gaming
Name: Rupak Thapa
Email: rupak.thapa2@mail.dcu.ie
Programme: Computer Applications
Supervisor: Charlie.Daly@dcu.ie

This game was developed to give new programmers an introduction to coding through visual representation. This is a gaming platform where new users can write their code and see the effect in the 3D world. The graphical world contains a robot, which is controlled by user code, to navigate through the obstacle and reach the goal. The game is focused on any age group who are new to programming.

Project Area: Gaming
Project Technology: C#
Project Number: 187

Project Title: CyberTight
Name: Jordan Noonan
Email: jordan.noonan5@mail.dcu.ie
Name: Michael Fahy
Email: michael.fahy6@mail.dcu.ie
Programme: Enterprise Computing
Supervisor: Stephen.Blott@dcu.ie

Our product, CyberTight, is dedicated to raising standards with regards to application, information and physical security. Our multifunctional website with specific security tools supports businesses in monitoring and improving upon various aspects of cyber security. Our customisable tool set allows companies to monitor and track security incidents and analyse potential threats. Our knowledge base provides professionals with a wealth of accurate and up-to-date information regarding software vulnerabilities, data regulations and other factors.

Project Area: Security, Web Application
Project Technology: CSS, HTML5, Java, JQuery, PHP, SQL

Project Number: 188

Project Title: Natural Language Learner
Name: Emma Gannon
Email: emma.gannon6@mail.dcu.ie
Programme: Computer Applications
Supervisor: Monica.Ward@dcu.ie

The Natural Language Learner is a web-based system to assist and encourage the learning of the language Nawat (an endangered language from Central America). The platform aims to engage with people of all ages to enable them to learn the language. The system has various levels of difficulty and there are quiz-based games to test learners’ knowledge at each level. The infrastructure of the system could be used to develop language learning resource for other endangered languages.

Project Area: Web Application
Project Technology: XML, SQL, JavaScript, Java, HTML5

Project Number: 189

Project Title: Analysis and Scoring of the Top 100 Irish Social Media Influencers.
Name: Ellie Goggin
Email: ellie.goggin3@mail.dcu.ie
Programme: Computer Applications
Supervisor: Alan.Smeaton@dcu.ie

This research project is inspired by Klout Score and Goss.ie’s list of 2016’s top 100 Irish Social Media Influencers. Klout don’t reveal their scoring system and we don’t know how Goss.ie generated this list. How did this list come to be? What makes these users influential? The goal is to investigate differences between these influencers by creating an algorithm to score them based on Twitter activity and using this data to create networks of followers allowing analysis of the influencers.

Project Area: Data Analytics
Project Technology: Python, NoSQL, Twitter API, NetworkX
**Project Number: 190**

**Project Title:** PY15: Implementation of Siemens Control System PLC on FMS central controller and Dashboard  
**Name:** Carlos Hartwick Moreno  
**Email:** carlos.hartwickmoreno2@mail.dcu.ie  
**Programme:** Mechanical and Manufacturing Engineering  
**Supervisor:** Paul.Young@dcu.ie

This project is to improve control on the central conveyor system, display the current status on an online dashboard and develop record keeping for statistical analysis of the performance of the whole system. It emphasises on establishing a networked connection between PLC’s implementing the system to industry 4.0.

**Project Area:** Automation, Sensor Technology, Software Development, Wireless Technology  
**Project Technology:** Siemens step 7

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**Project Number: 191**

**Project Title:** Music Retrieval System  
**Name:** Martin Finnegan  
**Email:** martin.finnegan9@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Gareth.Jones@dcu.ie

This project is an information retrieval system designed to search music scores for musical phrases, either in the form of a textual representation of the phrase or as an input from a MIDI Keyboard, and to return a ranked list of pieces (represented by MusicXML files) that contain all or part of the phrase and so be of interest to the user. The key objective of this project is to investigate representation and indexing music for effective searching.

**Project Area:** Information Retrieval  
**Project Technology:** Java, Eclipse

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**Project Number: 192**

**Project Title:** Infection Prevention and Control Report System  
**Name:** Leo Fitzpatrick  
**Email:** leo.fitzpatrick27@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Donal.Fitzpatrick@dcu.ie

A web application to allow infection control staff to replace the current paper form and Excel system to a database-driven system for recording and analysing patient data. Patient information entered onto the database via a series of forms, one per infection type. Retention of patient data allowing identification of patients with recurrent drug resistant infections. Data accessed via a simple query builder system allowing reports to be run and exported to Excel.

**Project Area:** Web Application  
**Project Technology:** AngularJS, HTML5, JavaScript, JQuery, PHP, SQL
<table>
<thead>
<tr>
<th>Project Number: 193</th>
<th></th>
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<tbody>
<tr>
<td><strong>Project Title:</strong></td>
<td>Development of a Lean/Six Sigma Toolbox for Energy Conservation in a Manufacturing Process</td>
</tr>
<tr>
<td><strong>Name:</strong></td>
<td>John Lindsay</td>
</tr>
<tr>
<td><strong>Email:</strong></td>
<td><a href="mailto:John.lindsay6@mail.dcu.ie">John.lindsay6@mail.dcu.ie</a></td>
</tr>
<tr>
<td><strong>Programme:</strong></td>
<td>Manufacturing Engineering with Business</td>
</tr>
<tr>
<td><strong>Supervisor:</strong></td>
<td><a href="mailto:Lorna.Fitzsimons@dcu.ie">Lorna.Fitzsimons@dcu.ie</a></td>
</tr>
<tr>
<td><strong>Project Area:</strong></td>
<td>Lean Manufacturing</td>
</tr>
<tr>
<td><strong>Project Technology:</strong></td>
<td>Excel/VB</td>
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</tbody>
</table>

This project investigates the appropriateness of lean/six sigma approaches for energy conservation in a manufacturing environment. The main objective is to assess suitable methods and to combine these into a holistic toolkit which can be used to drive energy efficiency and reduce cost in a manufacturing process. The results were analysed and applied to case studies with ABP Foods Ireland and Cadbury Ireland.

<table>
<thead>
<tr>
<th>Project Number: 194</th>
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</thead>
<tbody>
<tr>
<td><strong>Project Title:</strong></td>
<td>Development of a blister test for small adhesive samples</td>
</tr>
<tr>
<td><strong>Name:</strong></td>
<td>Michael Patrick Coyle</td>
</tr>
<tr>
<td><strong>Email:</strong></td>
<td><a href="mailto:michael.coyle6@mail.dcu.ie">michael.coyle6@mail.dcu.ie</a></td>
</tr>
<tr>
<td><strong>Programme:</strong></td>
<td>Biomedical Engineering</td>
</tr>
<tr>
<td><strong>Supervisor:</strong></td>
<td><a href="mailto:Garrett.McGuinness@dcu.ie">Garrett.McGuinness@dcu.ie</a></td>
</tr>
<tr>
<td><strong>Project Area:</strong></td>
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</tr>
<tr>
<td><strong>Project Technology:</strong></td>
<td>Zwick</td>
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</table>

The project aims to develop a blister test capable of comparing the adhesion characteristics of a number of medical tapes. The project will be carried out using custom parts to work in conjunction with the Zwick mechanical testing machine.

<table>
<thead>
<tr>
<th>Project Number: 195</th>
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<tbody>
<tr>
<td><strong>Project Title:</strong></td>
<td>The Musical Notepad</td>
</tr>
<tr>
<td><strong>Name:</strong></td>
<td>Darragh Connaughton</td>
</tr>
<tr>
<td><strong>Email:</strong></td>
<td><a href="mailto:darragh.connaughton5@mail.dcu.ie">darragh.connaughton5@mail.dcu.ie</a></td>
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<tr>
<td><strong>Programme:</strong></td>
<td>Computer Applications</td>
</tr>
<tr>
<td><strong>Supervisor:</strong></td>
<td><a href="mailto:Donal.Fitzpatrick@dcu.ie">Donal.Fitzpatrick@dcu.ie</a></td>
</tr>
<tr>
<td><strong>Project Area:</strong></td>
<td>Android</td>
</tr>
<tr>
<td><strong>Project Technology:</strong></td>
<td>JavaScript, Java, HTML5</td>
</tr>
</tbody>
</table>

The Musical Notepad is an application for converting recorded music into sheet music for Android devices. Processed sheet music is stored neatly away in a database, in JSON format, for retrieval at a later date. It is a documentation tool for capturing fleeting musical ideas, whenever they may arise.
### Project Number: 196

**Project Title:** Prison Run3D  
**Name:** Robert O'Connor  
**Email:** robert.oconnor47@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** David.Sinclair@dcu.ie

For my Final year project I created a game for PC, Mac and Linux Standalone. It is a 3D escape game, where you play a prisoner who has escaped from jail. The object of the game is to avoid all enemy objects (land mines, watch towers, guards and sniffer dogs). The game was developed using the Unity Game Engine.

**Project Area:** Gaming  
**Project Technology:** JavaScript

### Project Number: 197

**Project Title:** SMS Teleprinter Demostration  
**Name:** Gary Mullen  
**Email:** gary.mullen4@mail.dcu.ie  
**Programme:** Mechatronic Engineering  
**Supervisor:** Ronan.Scaife@dcu.ie

This project demonstrates how it is possible to interface between two forms of telecommunications, SMS and Telex. The project uses an Arduino microcontroller to interface a Teleprinter with SMS text messaging. It allows for the Teleprinter to both send and receive text messages. The project uses a microcontroller, GSM module, C-based programming, AT Commands and an interface circuit between the microcontroller and the Teleprinter.

**Project Area:** Arduino, SMS, Telecommunications  
**Project Technology:** C/C++

### Project Number: 198

**Project Title:** Evaluation of the System Dynamics Modeling Methodology  
**Name:** Luke Briody  
**Email:** luke.briody2@mail.dcu.ie  
**Programme:** Manufacturing Engineering with Business  
**Supervisor:** John.Geraghty@dcu.ie

System dynamics is an approach to understanding the non-linear behaviour of complex systems over time using stocks and flows, internal feedback loops and time delays. This project has developed an online training tool to help students learn the fundamental principles of system dynamics modeling. This project has created several simulation models using the system dynamics approach, and has evaluated existing system dynamics education online. The proposed training tool looks to address several fundamental problems identified in existing system dynamics education.

**Project Area:** Educational  
**Project Technology:** STELLA Computer Modeling Software
<table>
<thead>
<tr>
<th>Project Number: 199</th>
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</thead>
<tbody>
<tr>
<td><strong>Project Title:</strong>  Audio Mood-based 3D Music Visualisation</td>
</tr>
<tr>
<td><strong>Name:</strong>           Michal Hryciuk</td>
</tr>
<tr>
<td><strong>Email:</strong>          <a href="mailto:michal.hryciuk2@mail.dcu.ie">michal.hryciuk2@mail.dcu.ie</a></td>
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<tr>
<td><strong>Programme:</strong>      Computer Applications</td>
</tr>
<tr>
<td><strong>Supervisor:</strong>     <a href="mailto:Geoff.Hamilton@dcu.ie">Geoff.Hamilton@dcu.ie</a></td>
</tr>
</tbody>
</table>

VisualMood is an application designed with web technologies. Using Three.js it generates real-time three-dimensional scenes consisting of objects, particles and other visuals that animate according to properties extracted from playing audio. Web Audio API analyses playback audio to determine emotion and mood of music and uses it to shape, color and transform the visualisation. It features a music player with a functional playlist for playing audio files and streams.

**Project Area:** 3D Modelling, DSP, Graphics, Intelligence Pattern Matching, Model View Controller, Web Application

**Project Technology:** AngularJS, DSP, Fast Fourier Transform, HTML5, JavaScript, Node.js

<table>
<thead>
<tr>
<th>Project Number: 200</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project Title:</strong>  CNC control panel</td>
</tr>
<tr>
<td><strong>Name:</strong>           Ammar Al Badi</td>
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<tr>
<td><strong>Email:</strong>          <a href="mailto:ammar.albadi2@mail.dcu.ie">ammar.albadi2@mail.dcu.ie</a></td>
</tr>
<tr>
<td><strong>Programme:</strong>      Mechatronic Engineering</td>
</tr>
<tr>
<td><strong>Supervisor:</strong>     <a href="mailto:Tamas.Szecsi@dcu.ie">Tamas.Szecsi@dcu.ie</a></td>
</tr>
</tbody>
</table>

The project involves the design and manufacture of a control panel for controlling a virtual CNC machine tool. The panel consists of a pulse generator and switches. It will be linked to a PC (laptop) through a USB connection and will be accessible from a C/C++ program. The control elements of the panel will be used to operate a virtual machine tool which will be another 4th year project.

**Project Area:** Mechatronic Systems

**Project Technology:** C/C++

<table>
<thead>
<tr>
<th>Project Number: 201</th>
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<tbody>
<tr>
<td><strong>Project Title:</strong>  FlightMode</td>
</tr>
<tr>
<td><strong>Name:</strong>           Siobhain Brady</td>
</tr>
<tr>
<td><strong>Email:</strong>          <a href="mailto:siobhain.brady47@mail.dcu.ie">siobhain.brady47@mail.dcu.ie</a></td>
</tr>
<tr>
<td><strong>Name:</strong>           Katie Pringle</td>
</tr>
<tr>
<td><strong>Email:</strong>          <a href="mailto:katie.pringle2@mail.dcu.ie">katie.pringle2@mail.dcu.ie</a></td>
</tr>
<tr>
<td><strong>Programme:</strong>      Enterprise Computing</td>
</tr>
<tr>
<td><strong>Supervisor:</strong>     <a href="mailto:Markus.Helfert@dcu.ie">Markus.Helfert@dcu.ie</a></td>
</tr>
</tbody>
</table>

FlightMode is a mobile application designed to improve a passenger’s experience in the airport by providing real-time flight information and exclusive offers. The user scans the QR code on their boarding pass and receives their personalised flight details, including gate number, and opening time via push notifications, saving them time and effort checking airport screens. Airport businesses can use the app as a platform to promote their products to customers, creating sales opportunities and allowing passengers to shop efficiently.

**Project Area:** Android, Mobile App

**Project Technology:** Java, SQL, XML
### Project Number: 202

**Project Title:** Performance analysis and improvement of an FMS Rig station  
**Name:** Lorcan Murphy  
**Email:** lorcan.murphy89@mail.dcu.ie  
**Programme:** Mechatronic Engineering  
**Supervisor:** Paul.Young@dcu.ie

This project will require the development of new raw material feed, interlocks and control to enable the station on the FMS rig perform the required assembly task more efficiently. The performance improvement will be determined on the basis of analysis of the design of the current system, new operation specification and implementation under control of a Siemens PLC. This will then communicate KPI’s to the central PLC over the network to provide information on system performance.

**Project Area:** Lean Manufacturing, Mechanical Design and Manufacture  
**Project Technology:** PLC Programming

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### Project Number: 203

**Project Title:** ActiGO  
**Name:** Sean Anglim  
**Email:** sean.anglim4@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Monica.Ward@dcu.ie

ActiGO is an intermediary booking service between independent activity organisations and customers. From mountain biking to windsurfing, ActiGO allows customers to locate an organisation that suits their needs, easily place bookings and pay securely through the Stripe payments platform. ActiGO provides each organisation with an online presence without the prohibiting cost and/or technical knowledge required to develop and maintain a dynamic e-commerce website. Visit www.actigo.ie and check it out!

**Project Area:** Web Application  
**Project Technology:** CSS, HTML5, JavaScript, Node.js, REST, SQL, Angular 2

---

### Project Number: 204

**Project Title:** Bookezi – The Music Lessons Marketplace  
**Name:** Sean McGrath  
**Email:** mpsmcgrath@gmail.com  
**Name:** Philip O’Driscoll  
**Email:** philip.odricoll4@mail.dcu.ie  
**Programme:** Enterprise Computing  
**Supervisor:** Cathal.Gurrin@dcu.ie

Bookezi is a music lessons marketplace that empowers teachers to become entrepreneurs. It offers a platform that manages a teacher’s business through an innovative Business Management Dashboard, with a booking system that frees teachers from antiquated booking methods and allows instant lesson booking. For students and parents it offers easy access to a wealth of qualified, background-checked musical talent. The multi-platform Bootstrap/Node.js web-application uses several web technologies to bring the gig-economy model to private music teaching.

**Project Area:** Educational, Web Application  
**Project Technology:** HTML5, JavaScript, JQuery, Node.js, REST, NoSQL
**Project Number: 205**

**Project Title:** Orb Search  
**Name:** Arsen Kovalchuk  
**Email:** arsen.kovalchuk2@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Gareth.Jones@dcu.ie

This project consists of a unique search engine system which assists users in finding information that they are looking for more efficiently. It seeks to assist users in searching for this information without having to iterate through numerous documents when they cannot clearly describe what they are searching for. The key innovation in this project is the inclusion of a unique graphical approach and keyword recommendation feature using 3D graphics within the web browser to support user navigation of retrieved content.

**Project Area:** 3D Modelling, Databases, Data Analytics, Data Mining, Graphics, Information Retrieval, Software Development, Statistical Analysis, Web Application  
**Project Technology:** AngularJS, CSS, Eclipse, HTML5, Java, JavaScript, JQuery, XML, Lucene, Threejs(WebGL)

---

**Project Number: 206**

**Project Title:** Schoolable  
**Name:** Tríona Barrow  
**Email:** triona.barrow2@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Donal.Fitzpatrick@dcu.ie

The website was developed for special education schools to act as an online management system for students, parents and staff. This system will act as a replacement for the communication copy and hold student details including basic details as well as medical needs. The system is intended to act as an online record for parents and teachers in order to ensure the best for the student.

**Project Area:** Content Management System, Educational, Model View Controller, Software Development, Web Application  
**Project Technology:** Java, SpringMVC, SQL

---

**Project Number: 207**

**Project Title:** Performance Management  
**Name:** Cliona Kehoe  
**Email:** cliona.kehoe23@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Markus.Helfert@dcu.ie

Performance Management is a web-based management system for GAA clubs. The platform aims to engage with members and enable them to keep informed of upcoming matches as well as keep track of their performance in games and training sessions, with the use of wearable technology.

**Project Area:** Motion Analysis, Web Application  
**Project Technology:** AngularJS, Java
Project Number: 208

Project Title: Electroluminescence in Photovoltaic Cells  
Name: Bríd O’Neill  
Email: brid.oneill34@mail.dcu.ie  
Programme: Mechatronic Engineering  
Supervisor: Patrick.McNally@dcu.ie

This project investigates the electroluminescent behaviour of photovoltaic cells through the use of simple webcams and electronic apparatus. Through this, the dependence of open-circuit voltage and open-circuit current as a function of cell temperature will be explored. The resulting images from the webcams are then explored using the ImageJ software platform.

Project Area: Energy Conservation  
Project Technology: ImageJ

Project Number: 209

Project Title: Ultrasonic thermometer  
Name: David Courtney  
Email: david.courtney5@mail.dcu.ie  
Programme: Mechatronic Engineering  
Supervisor: Conor.McArdle@dcu.ie

This aim of this project was to design and build an ultrasonic thermometer for accurately measuring the average temperature over large spaces. The project consists of an ultrasonic transmitter and receiver. The system calculates the time taken for an ultrasonic signal to leave the transmitter and be received by the receiver. This time difference is used to calculate the speed of sound and therefore temperature.

Project Area: Arduino, Device Design  
Project Technology: C/C++

Project Number: 210

Project Title: VOX – Natural Language Interface  
Name: Brendan Harlin  
Email: brendan.harlin2@mail.dcu.ie  
Programme: Computer Applications  
Supervisor: Gareth.Jones@dcu.ie

VOX is a mobile interface that allows a user to get answers to their data query questions instantly using natural language against a business intelligence backend system. When the user’s question is sent to VOX, it converts the question to a data query and then returns the matching data. VOX enables users to look at their frequently asked questions and interact with an intuitive chart if it’s returned with their answer to give them a better understanding of their data.

Project Area: Mobile Business Intelligence  
Project Technology: C#, HTML5, JavaScript, JQuery, SQL
Project Number: 211

Project Title: Designing and building a test rig for the study of valves and pumping chambers of a reciprocating pump

Name: Martin Deane
Email: Martin.deane2@mail.dcu.ie
Programme: Mechanical and Manufacturing Engineering
Supervisor: Yan.Delaure@dcu.ie

This project involves designing and building the hydraulic part of a reciprocating pump prototype to study the behaviour of an outlet valve in response to fluid induced pressure. The design of the valve and chamber were completed using Solidworks with the chamber made out of plexiglas to allow visual inspection of internal parts. Computational Fluid Dynamics has been used to inform the spring selection, sensor location and to help interpret the experimental results.

Project Area: Fluid Mechanics, 3D Modelling
Project Technology: CFD, Solidworks

Project Number: 212

Project Title: Sentiment Analysis of Twitter Data

Name: Aine Boyle
Email: aine.boyle22@mail.dcu.ie
Programme: Computer Applications
Supervisor: Ray.Walshe@dcu.ie

A website was developed which allows a user to enter a keyword or list of keywords. Twitter is then searched to find tweets related to these keywords. Each tweet is then analysed in order to determine its sentiment classification. Information is then returned to the user summarising how many positive, negative and neutral tweets were found, along with the top n positive and top n negative tweets found.

Project Area: Natural Language Processing
Project Technology: Python

Project Number: 213

Project Title: Castsender

Name: Lonneke Schutte
Email: lonneke.schutte2@mail.dcu.ie
Programme: Computer Applications
Supervisor: Renaat.Verbruggen@dcu.ie

Castsender is an Android weather tracking application making use of an open weather API to access and display up-to-date weather and storm data. Emphasises simple selection of desired regions for tracking and offers a customisable notification system with alerts through several channels.

Project Area: Mobile App
Project Technology: Java
<table>
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<tbody>
<tr>
<td><strong>Project Title:</strong></td>
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<tr>
<td><strong>Name:</strong></td>
<td>Cormac Sugrue</td>
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<tr>
<td><strong>Email:</strong></td>
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<td>Computer Applications</td>
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<tr>
<td><strong>Supervisor:</strong></td>
<td><a href="mailto:Donal.Fitzpatrick@dcu.ie">Donal.Fitzpatrick@dcu.ie</a></td>
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</table>

BeatBlox is an audio production and performance app for iOS. The app allows users to record, import and edit a collection of audio samples. These sound bites can be either triggered live or carefully arranged into rhythmic patterns from the app’s sequencer. Furthermore, the arranged sounds can then be manipulated using the set of audio processing effects. The parameters of these effects can be mapped to the device’s accelerometer allowing for creative and dynamic live performances.

**Project Area:** Mobile App, Audio Processing  
**Project Technology:** Swift

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<th>Project Number: 215</th>
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<tbody>
<tr>
<td><strong>Project Title:</strong></td>
<td>Fitness Tracker</td>
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<tr>
<td><strong>Name:</strong></td>
<td>Steven Kinsella</td>
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<tr>
<td><strong>Email:</strong></td>
<td><a href="mailto:Steven.kinsella35@mail.dcu.ie">Steven.kinsella35@mail.dcu.ie</a></td>
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<td><strong>Programme:</strong></td>
<td>Electronic and Computer Engineering</td>
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<tr>
<td><strong>Supervisor:</strong></td>
<td><a href="mailto:Martin.Collier@dcu.ie">Martin.Collier@dcu.ie</a></td>
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The project is based around the EZ430 Chronos, a reprogrammable smartwatch. The on-board sensors are programmed to detect the user’s physical activity to determine physical parameters such as distance travelled, calories burned, etc. These parameters are then sent via the watches RF protocol, simpliciTI, to a Raspberry Pi. The Raspberry Pi acts as storage for the data and runs an Apache web server to display the user’s parameters.

**Project Area:** Device Design, Internet of Things, Wireless Technology  
**Project Technology:** HTML5

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<th>Project Number: 216</th>
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<tr>
<td><strong>Project Title:</strong></td>
<td>Design and implement a fully automated mixed powder production line.</td>
</tr>
<tr>
<td><strong>Name:</strong></td>
<td>Ronan Byrne</td>
</tr>
<tr>
<td><strong>Email:</strong></td>
<td><a href="mailto:ronan.byrne49@mail.dcu.ie">ronan.byrne49@mail.dcu.ie</a></td>
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<td><strong>Programme:</strong></td>
<td>Manufacturing Engineering with Business</td>
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<tr>
<td><strong>Supervisor:</strong></td>
<td><a href="mailto:Paul.Young@dcu.ie">Paul.Young@dcu.ie</a></td>
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</table>

The goal of this project was to design an automated bagging by weight system for a production line. The project included plant layout, filling/sealing system procurement, and design of feed elements such as augers, hoppers, sieves, scales, etc. All elements were designed to suit required production rate demands and ensure the weight of each bag was within the required tolerance, with the output of the project being an evaluation of performance as implemented, against the specified KPI at design stage.

**Project Area:** Automation  
**Project Technology:** PLC Programming, Solidworks
Project Number: 217

Project Title: Development of a custom multi-touch interface for manipulating 3D content
Name: Karl Dwyer
Email: karl.dwyer3@mail.dcu.ie
Programme: Electronic and Computer Engineering
Supervisor: Robert.Sadleir@dcu.ie

Touch screens are becoming more common in everyday life while also being used for more diverse applications. This increased use has led to improvements in touch screen features and functionality. There is also a movement towards larger touch screens supporting far more synchronous touches. This project involves exploiting the advancements in multi-touch support to develop a CAD application that facilitates 3D graphic interaction through a set of custom multi-touch gestures devised for specifically for use with 3D content.

Project Area: Touchscreen Gesture Recognition, 3D Modelling
Project Technology: OSGJS, JavaScript, Java, HTML5

Project Number: 218

Project Title: Construction and Test of a Hall Effect System
Name: Darragh Nolan
Email: darragh.nolan43@mail.dcu.ie
Programme: Electronic and Computer Engineering
Supervisor: Patrick.McNally@dcu.ie

The Nanomaterials Processing Laboratory in DCU possess a Hall Effect System. The Hall Effect is an important tool in the characterisation of semiconductors. This system was tested, debugged and modified to perform Hall Effect measurements. A number of semiconductor samples were tested to check that accuracy of the system and results were compared with known information. The system is to be used as a teaching aid in solid-state modules in DCU.

Project Area: Automation, Solid-State Materials, Instrumentation
Project Technology: Electronic Instrumentation, Solid-State physics

Project Number: 219

Project Title: Wireless Mesh Network of Raspberry Pis
Name: William Corrigan
Email: william.corrigan2@mail.dcu.ie
Programme: Electronic and Computer Engineering
Supervisor: Martin.Collier@dcu.ie

This project investigates the formation of an efficient, wireless mesh network between a number of single board computers (SBC). The chosen SBCs for this project were Raspberry Pis, but the concepts explored are general and can be adapted to any device running embedded Linux.

Project Area: Internet of Things, Network Applications, Wireless Technology
Project Technology: IEEE 802.15.4 ZigBee, Python, Embedded Linux
Project Number: 220

Project Title: Letter Writing Checker
Name: Daragh Lawlor
Email: daragh.lawlor27@mail.dcu.ie
Programme: Computer Applications
Supervisor: Monica.Ward@dcu.ie

The application was developed to help young learners learn the letters of the alphabet. The app checks if the letters have been written correctly. It also stores statistics on the learner’s letter writing development that can be reviewed by a parent or a teacher. The app is designed for young learners with no prior knowledge of letters.

Project Area: Android
Project Technology: Java

Project Number: 221

Project Title: Gamification Of Learning
Name: Andrew Bone
Email: andrew.bone2@mail.dcu.ie
Programme: Computer Applications
Supervisor: Monica.Ward@dcu.ie

This project is a language independent teaching application which aims to teach the language through compelling interactive video games. The application comes equipped with a database containing different aspects of the language. This database provides the tests and challenges the user must face in the game. Each game features original graphical and audio assets. The application is built in C# and uses the Unity Engine. This application is for Android devices.

Project Area: Gaming
Project Technology: C#, SQL

Project Number: 222

Project Title: Development of a value stream mapping library for extendsim
Name: Givens Maku
Email: givens.maku2@mail.dcu.ie
Programme: Manufacturing Engineering with Business
Supervisor: John.Geraghty@dcu.ie

Value stream mapping is a basic pen and paper Lean tool that follows a product’s production path from customer demand to supplier and draws a visual representation of every process in the material and information flow. This project aims to create a value stream mapping (VSM) using simulation. ExtendSim9 is employed as the simulation software of choice used to create a VSM library. Through literature-based case study, models are developed and the library is tested.

Project Area: Lean Manufacturing
Project Technology: ExtendSIM
Project Number: 223

Project Title: Development of Lean Manufacturing in the Aughnish Alumina Workshop
Name: Claire Lowes
Email: claire.lowes2@mail.dcu.ie
Programme: Mechanical and Manufacturing Engineering
Supervisor: John.Geraghty@dcu.ie

This project aims to develop a more lean system of work in the main workshop of Aughnish Alumina, an alumina refinery based in Limerick. The key issues to be addressed and resolved are the unnecessary amount of movement of parts in the workshop, the amount of time each part has to wait before it is worked on, and the number of parts in the workshop at any given time that are not currently being worked on.

Project Area: Lean Manufacturing
Project Technology: N/A

Project Number: 224

Project Title: Simulating Systems of Governance
Name: Aaron Edgeworth
Email: aaron.edgeworth3@mail.dcu.ie
Programme: Computer Applications
Supervisor: Alistair.Sutherland@dcu.ie

This project is a simulator that allows the user to generate a simple, modeled society that is run under different forms of governance. As the environment changes, so too may the governmental needs of the population. The context of a society and its environment will alter the requirements of its governing body.

Project Area: AI/Simulation
Project Technology: C#

Project Number: 225

Project Title: Colourising greyscale images using deep learning
Name: Eoin Magner
Email: eoin.magner3@mail.dcu.ie
Programme: Computer Applications
Supervisor: Suzanne.Little@dcu.ie

The aim of this project is to utilise a convolutional neural network (CNN) to colourise greyscale images. The network was trained by taking images with colour and converting them to black and white. This provided the input and output for training. The CNN is written in Python using the TensorFlow framework.

Project Area: Artificial Intelligence, Automation, Data Analytics, Image Video Processing
Project Technology: Python
Project Number: 226

Project Title: Upgrade of a Pharmaceutical Compressed Air System
Name: Adam Matthews
Email: adam.matthews25@mail.dcu.ie
Programme: Manufacturing Engineering with Business
Supervisor: Brian.Corcoran@dcu.ie

This project is focused on applying theory and knowledge of project management techniques and approaches to an industry-based project. The aim of this project was to conduct a complete upgrade of the compressed air system for IPSEN Manufacturing Ireland. This involved increasing capacity, improving reliability and introducing quality measures to develop a robust and reliable system. This project examines the complete project life cycle from initiation right through to project closure.

Project Area: Industry Based Utility Upgrade
Project Technology: N/A

Project Number: 227

Project Title: Pick King
Name: Jack Curtis
Email: jack.curtis5@mail.dcu.ie
Name: Martin Kelly
Email: martin.kelly246@mail.dcu.ie
Name: Brendan Mc Quaid
Email: brendan.mcquaid3@mail.dcu.ie
Programme: Enterprise Computing
Supervisor: Andrew.McCarren@dcu.ie

Pick King is a web-based gambling application that facilitates group orientated gambling in various different forms. The main purpose is to allow users to create and partake in unique and specified gambling events varying in sports, stakes and event sizes. Not only for the individual, the application can also be used to raise vital funds for all types of organisations, including local sports clubs and charities.

Project Area: Web Application
Project Technology: CSS, HTML5, JavaScript, PHP, SQL

Project Number: 228

Project Title: Simulation of reflective semiconductor optical amplifier
Name: Maadh Alnaabi
Email: maadh.alnaabi2@mail.dcu.ie
Programme: Electronic Engineering
Supervisor: Pascal.Landais@dcu.ie

In this project my roles are to:
1. adapt a model already developed to determine the carrier distribution in SOA to the RSOA.
2. study how the power saturation in this device can be controlled by the carrier distribution.

Project Area: Reflective Semiconductor Optical Amplifier
Project Technology: MATLAB
### Project Number: 229

**Project Title:** Simulation of Tm3+-doped LiNbO3 laser  
**Name:** Basim Humaid  
**Email:** basim.walddhawi2@mail.dcu.ie  
**Programme:** Electronic and Computer Engineering  
**Supervisor:** Pascal.Landais@dcu.ie

The project goal is to simulate a Tm3+-doped LiNbO3 laser. The wavelength should be 2um so that it can be used in the arena of spectroscopy or medical care applications. There are some calculations applied in designing a suitable wavguide and they are used to develop a simulation tool to design a Tm3+-doped LiNbO3 laser.

**Project Area:** Laser waveguide  
**Project Technology:** MATLAB

### Project Number: 230

**Project Title:** Design and Build of a Ball Balancing Robot  
**Name:** Chigozie Anyanwu  
**Email:** chigozie.anyanwu3@mail.dcu.ie  
**Programme:** Mechatronic Engineering  
**Supervisor:** Noel.Murphy@dcu.ie

A ball-bot is a mobile robot designed to balance on a single spherical ball. This is achieved through the use of sensors with and appropriate control system that drives three actuator wheels that support the ball-bot on its ball. The aim of this project is to design and build a ball-bot that is capable maintaining its balance against disturbances. This is a follow-on project that will build on the achievements made and lessons learned in a previous final year project.

**Project Area:** Robotics, Motion Analysis, Mechatronic Systems, Mechanical Design and Manufacture, Embedded Systems, Control Systems, Circuit Modeling, Automation, Arduino, 3D Modelling  
**Project Technology:** Solidworks, MATLAB, Excel/VB, C/C++

### Project Number: 231

**Project Title:** Mileage  
**Name:** Brian O’Meara  
**Email:** brian.omeara3@mail.dcu.ie  
**Name:** Bobby Clarke  
**Email:** bobby.clarke24@mail.dcu.ie  
**Programme:** Enterprise Computing  
**Supervisor:** Qun.Liu@dcu.ie

This project follows the development of an application aimed at helping users find transport solutions. Its focus is on enabling group bookings for bus operators and coaches, a process which is currently slow and laborious for the users seeking the best value possible. Mileage will bring this process into the 21st century, giving users the ability to easily compare prices and options, and book their transport. Available on Mobile and Web.

**Project Area:** Mobile App, Web Application  
**Project Technology:** CSS, HTML5, JavaScript, JQuery, PHP, SQL
Project Number: 232

**Project Title:** The development of a test rig to assess the functional properties of tissue engineered heart valves  
**Name:** Cathal Costello  
**Email:** cathal.costello38@mail.dcu.ie  
**Programme:** Biomedical Engineering  
**Supervisor:** Tanya.Levingstone@dcu.ie

For this project a test rig was developed which allows for the basic testing of tissue engineered heart valves in order to investigate their durability under physiological flow conditions. Tissue engineered heart valves are seen as the future for cardiac treatment and the ability to validate their performance is important to medical manufacturers. The design demonstrates the possible versatility and efficiency that can be implemented when developing test apparatuses for medical treatment investigations.

**Project Area:** Tissue Engineering  
**Project Technology:** LabVIEW

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Project Number: 233

**Project Title:** Modelling of a nyquist wavelength division multiplexed transmission system  
**Name:** David Stack  
**Email:** david.stack3@mail.dcu.ie  
**Programme:** Electronic and Computer Engineering  
**Supervisor:** Liam.Barry@dcu.ie

Due to the huge increase in demand for bandwidth, there is an urgency to increase the date rate and capacity of installed optical fibre systems. The project investigates one solution of this problem by increasing the number of data bits per transmission symbol by the use of a Nyquist Wavelength Division Multiplexed superchannel communication system. The test involves using a Quadrature Phase Shift Keying and a 16-Quadrature Amplitude Modulation signal to be inputted into the communication system.

**Project Area:** Telecommunications  
**Project Technology:** MATLAB

---

Project Number: 234

**Project Title:** Nutrition and health  
**Name:** Kvetoslava Sliacanova  
**Email:** kvetoslava.sliacanova2@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Renaat.Verbruggen@dcu.ie

This webapp is designed to enable people to manage their diet more efficiently and easily. They can achieve the goals they desire by creating their own individual set of formulae. These would in return give them their own personal specific results from which then they’d be offered sets of recipes for foods beneficial to them.

**Project Area:** Web Application  
**Project Technology:** Ruby on rails
### Project Number: 235

**Project Title:** Convolutional Neural Network that Classifies Images  
**Name:** Matthew Hagan  
**Email:** matthew.hagan4@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Andrew.McCarren@dcu.ie

An image recognition system that recognises images and identifies what they are. The main component of the system is a convolutional neural network which has been trained with a dataset of leaves. When given a leaf image the neural network identifies what species the leaf is from. The neural network is written in Tensor Flow.

**Project Area:** Computer Vision, Image Video Processing  
**Project Technology:** Python

### Project Number: 236

**Project Title:** GAA Team Stat Tracker  
**Name:** James Hackett  
**Email:** james.hackett3@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Paul.M.Clarke@dcu.ie

This project is a proof of concept for a new method of sports stat retrieval. Instead of using traditional pen and paper or a touch screen-based app this project will use voice recognition and a fit for purpose spoken language which is processed to gather the statistics. The end result should be the ability to record game stats in a commentary like fashion without having to look away from the game to record the data.

**Project Area:** Information Retrieval  
**Project Technology:** Java

### Project Number: 237

**Project Title:** Leaving Cert Physics Simulator  
**Name:** Colm Curtis  
**Email:** colm.curtis2@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Liam.Tuohey@dcu.ie

This project is a simulator for the experiments currently on the Leaving Certificate Physics curriculum. Users are allowed to choose their desired experiment and the project will provide a visual simulation of the chosen experiment. Upon completion of the experiment, results will then be generated and displayed to the users. The users can then use these results to validate what the experiment is trying to prove. The project is aimed at both teachers and students of Leaving Certificate Physics.

**Project Area:** Educational, Simulation  
**Project Technology:** C#, Unity
<table>
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<th>Project Number</th>
<th>Project Title</th>
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<th>Email</th>
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<td><a href="mailto:Prince.Anandarajah@dcu.ie">Prince.Anandarajah@dcu.ie</a></td>
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</table>

This project uses optical frequency combs in the detection of CO$_2$ and other spectrally adjacent species. By implementing a dual comb structure it is possible to achieve high detection sensitivity and spectral resolution in the radio frequency domain using a common photodiode. This ability to interrogate data using a photodiode rather than a spectral analyser has obvious benefits in terms of cost and the real-time analysis of data.

<table>
<thead>
<tr>
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<tr>
<td>Circuit Modeling, DSP, Sensor Data, Sensor Technology</td>
<td>DSP, Fast Fourier Transform, VPI photonics</td>
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<td><a href="mailto:Monica.Ward@dcu.ie">Monica.Ward@dcu.ie</a></td>
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Pocket Quiz is a multiple choice quiz (MCQ) app for secondary school and third-level students. Student users can create, rate and share quizzes with fellow students within study groups or class groups. Teachers and lecturers can also create, rate and share quizzes. Teachers and lecturers are able to assign quizzes and continuous assessments assignments to their students or share them with other educational professionals. Quizzes will also be provided by publishers – these quizzes will be promoted.

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</tbody>
</table>

This project was started with the aim of launching a competitive service for online ticket sales. A prototype application was developed to showcase the vision for the service as well as a comprehensive and thorough business plan. The prototype demonstrates overall app functionality, Facebook integration and event suggestions as well as looking at using NFC-enabled devices as the 'ticket' to enter events.

<table>
<thead>
<tr>
<th>Project Area</th>
<th>Project Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobile App</td>
<td>Prototype</td>
</tr>
</tbody>
</table>
**Project Number: 241**

**Project Title:** HE18 – Android Controlled Vehicle  
**Name:** Aodhán Ó Gabhann  
**Email:** aodhan.ogabhann2@mail.dcu.ie  
**Programme:** Mechatronic Engineering  
**Supervisor:** Harold.Esmonde@dcu.ie

This project deals with the design, building and testing of a two-wheeled self-balancing vehicle using an Android-based smartphone. This vehicle incorporates two stepper motors which provide the vehicle’s motion and relies solely on the phone’s onboard sensors to keep the device upright and balanced.

**Project Area:** Android, Control Systems, Mechatronic Systems, Mobile App, Vehicle Control  
**Project Technology:** Java

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**Project Number: 242**

**Project Title:** Two sided rental marketplace  
**Name:** Kevin Mulligan  
**Email:** kevin.mulligan23@mail.dcu.ie  
**Name:** Cianan Simpson  
**Email:** cianan.simpson5@mail.dcu.ie  
**Name:** Gavin Drumm  
**Email:** gavin.drumm2@mail.dcu.ie  
**Programme:** Enterprise Computing  
**Supervisor:** Monica.Ward@dcu.ie

Our project creates an online peer to peer marketplace for the rental of personal possessions such as music equipment, tools, bikes, etc. Users will be presented with a geographical map of nearby listed items, allowing fast access to items they need for a fraction of the price of buying it and provides a new way for people to make money from underutilised items they own. The website will allow users to list items for rent to their verified public profile.

**Project Area:** Web Application  
**Project Technology:** Ruby

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**Project Number: 243**

**Project Title:** Parametric Finite Element Modelling of Stress Concentrators  
**Name:** Dylan Cunningham  
**Email:** dylan.cunningham23@mail.dcu.ie  
**Programme:** Mechanical and Manufacturing Engineering  
**Supervisor:** Bryan.MacDonald@dcu.ie

Parametric finite element analysis of several common stress concentrating features. Building of a finite element model of each feature using ANSYS software. Validation of these models by comparison with existing analytical solutions. Subsequent sensitivity analysis using the model to determine the effect of the various parameters contributing to the stresses in the structure. Comparison of results to existing design data with the intent to improve or supplement design data and validate the use of finite element modelling in design.

**Project Area:** Mechanical Design and Manufacture  
**Project Technology:** ANSYS
DCU School of Computing introduce the new B.Sc. Data Science degree  datascience.dcu.ie

DCU is pleased to announce a brand new course, the first of its kind in Ireland, addressing the need for graduates in the exciting and growing area of data science. The B.Sc. in Data Science at DCU combines the three key skill sets of computing, mathematics and communication to provide the core knowledge needed to succeed. The course will introduce students to the major concepts in data analytics, management, programming, processing, modelling, visualisation and communication while providing opportunities to engage with real-world problems and datasets. Students will learn to code, learn mathematics and statistics, and apply their skills to data from the real world. This course is particularly interesting for creative students with strong maths and problem solving skills who want to make a difference, to apply their interests and solve real problems.

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**Type of degree:** Full-time NFQ Level 8 Honours Bachelors  
**Topics covered:** Computer programming, machine learning/artificial intelligence, data analytics, visualisation and communication, statistics and probability.  
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### Scholarships

DCU are proud to announce new scholarship programmes.

**URBANVOLT**

The UrbanVolt Scholarship programme will cover the full fees for one full time Masters programme at DCU, beginning September ’17.

More details will be announced at the DCU Faculty of Engineering and Computing Expo, when it will be officially launched by Professor Brian MacCraith. He will be joined by former DCU students and current UrbanVolt founders/investors, Graham Deane and Jamie Heaslip.

**INTEL**

Intel are delighted to announce its 2017-18 scholarship programme for graduates (and prospective 2017 graduates) who plan to enter either the DCU MEng in Electronic and Computing Engineering or the DCU MEng in Mechanical and Manufacturing Engineering. Relevant undergraduate backgrounds include those of Mechanical, Manufacturing, Electronic and Electrical Engineering, Applied Physics, Computer Sciences or other Engineering disciplines. More details to be announced at the DCU Final Year Projects Expo.

Scholarship details will be posted on the DCU website.
Intel is delighted to announce its 2017-18 scholarship program for graduates (and prospective 2017 graduates) who plan to enter either the DCU Computer Electronic and Computing Engineering or the DCU Mechanical and Manufacturing Engineering.

Relevant undergraduate backgrounds include those of Mechanical, Manufacturing, Electronic and Electrical Engineering, Applied Physics, Computer Sciences or other Engineering disciplines.

More details to be announced at the DCU Final Year Projects Expo.
Many thanks to the following companies for sponsoring prizes:

**OPENET**

OPENET is one of the largest privately owned software companies in Ireland. The ambition and vision of Openet’s senior team including, Founder and CTO Joe Hogan and CEO Niall Norton, has been essential to the organisation’s continued success. Openet has more than 80 customers in 32 countries and now has a workforce of more than 830 people globally with offices in the US, Malaysia and Brazil. A significant number of Openet staff are DCU graduates, according to Joe Hogan, a proud graduate of DCU’s B.Sc. in Computer Applications (1989). “Openet has long recognised the calibre of graduates produced by DCU, particularly from the School of Computing, and more recently we have been working to strengthen the relationship links between Openet and the University. We are keen for DCU students to view Openet as an employer of choice when they graduate”.

Openet provides the systems and expertise to assist Communication Service Providers to grow to become Digital Service Providers. Openet enables this through our real-time monetisation, control, and big data preparation systems. Our solutions enable service providers to be more innovative in how they engage with their customers to drive new revenues and increase their shares of their customers’ digital spend. Since its foundation in 1999, Openet has constantly been at the forefront of telecoms software development and innovation. Its success is personified by the many long-term relationships it has fostered with the largest, most progressive, and demanding operators across the globe. Such demands for innovation still lead the industry, easily processing more than 10 billion daily network transaction records at a single network operator. Openet is truly an international company with over 99 per cent of revenues coming from outside of Ireland.

For more information see: [www.openet.com](http://www.openet.com)

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**Davy Group**

*Who are we*

Davy is Ireland’s leading provider of wealth management, asset management, capital markets and financial advisory services. For over 90 years, at Davy we have consistently adapted and innovated to deliver exceptional results for our clients, and in doing so we have gained a reputation as one of Ireland’s leading companies. Our purpose is to make a meaningful contribution to our clients by providing timely advice and investment outcomes of superior quality. As a result, clients will reward us with long term value creating relationships which will allow Davy to grow, staff to enjoy success and our stakeholders to achieve their goals. The Davy Group is headquartered in Dublin with offices in London, Belfast, Cork and Galway and employs over 670 people.
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Technology is at the heart of everything we do for our clients. As a graduate working in the Information Systems team, you will work with over 55 other IT professionals to design and deliver the systems that help to run our business. Our team has a very diverse skills profile, from software developers, network engineers, database administrators and business analysts to system administrators, IT security specialists and project managers. Davy provides a challenging environment where you can develop your technical and professional skills with the guidance and assistance of a knowledgeable, professional and energetic team. Whatever your interests and career aspirations, Davy can provide an environment where you can develop your skills and broaden your understanding of how Information Technology can deliver value to businesses.

Based in Dawson Street in Dublin city centre, we offer a great work environment with fantastic on-site facilities, such as our on-site gym and fitness studio. We have a very active sports and social scene, which will help you to integrate into the overall Company, so whether you are interested in Urban Fitness, TRX, Pilates, Yoga, Wine Tasting, French language lessons, golf, 5-a-side football, or something different, there is something to suit all tastes.

At Davy, we recognise the importance of continuous learning. To this end, we encourage our staff to pursue self-development opportunities through the acquisition of professional qualifications, formal training and active on-the-job coaching. Davy also invests in your personal development, offering a range of in-house seminars on a variety of topics such as emotional intelligence, persuasive communications, and mindfulness.

For more information see www.davy.ie/careers/graduates

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We are always seeking IT and Business graduates to join our team as Developers, Testers, Consultants and Interns. Indeed, our founder and CEO, Michael Kelly, is a graduate of Computer Applications in DCU. Working as a Graduate in FINEOS provides an excellent opportunity for you to acquire real-world experience of the software industry. FINEOS offers comprehensive training for all graduates geared towards long term career progression and personal development. Based in EastPoint Business Park, Dublin 3, we offer a great work environment with flexible working, monthly sports and social club events, scrum areas, exercise and games rooms.

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Fidelity Investments is one of the world’s largest providers of financial services. Founded in Boston in 1946, our goal is to make our financial expertise broadly accessible and effective in helping people live the lives they want. At Fidelity Ireland, we provide middle and back office support to our business partners and design, build and implement technology that maintains Fidelity’s continued global success. We harness our cutting-edge technology capabilities and resources to continuously innovate in ways that create better outcomes and experiences for our customers.

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Discover more at: www.fidelityinvestments.ie
For further information, please contact:

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Email: Christine.Stears@dcu.ie
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