

Using NLP Technology in CALL

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Using NLP Technology in CALL

- Background
- Research methodology
- Activities
 - Plurilingual ICALL System for Romance Languages
 - Artificial Co-Learner
 - ICALL in the Primary School
 - ICALL for Learners with Learning Difficulties
 - ICALL for LCTL
- Summary of research/findings to date



Background of the ICALL Group

- Computational linguists with an interest in CALL
- Six researchers
 - computational linguists
 - software engineers
 - expertise includes
 - general NLP skills, corpus processing
 - CALL, teaching experience
- Interested in different learner types
 - Beginners to advanced, young learners to adults



Research Methodology

- Re-use of existing technologies
 - avoiding “re-inventing the wheel”
- Learning from other ICALL projects
 - avoiding known pitfalls
- Learner-centred design
 - focusing on the needs of the learner
 - taking into account pedagogy and design
 - design for concurrent evaluation



Plurilingual ICALL System

- Target learner
 - advanced speaker of at least one Romance language
 - French, Spanish and Italian supported
 - target language(s): one or two of the other
- Idea
 - leverage the learner’s existing knowledge of already learned Romance language
 - not learning a new language from scratch

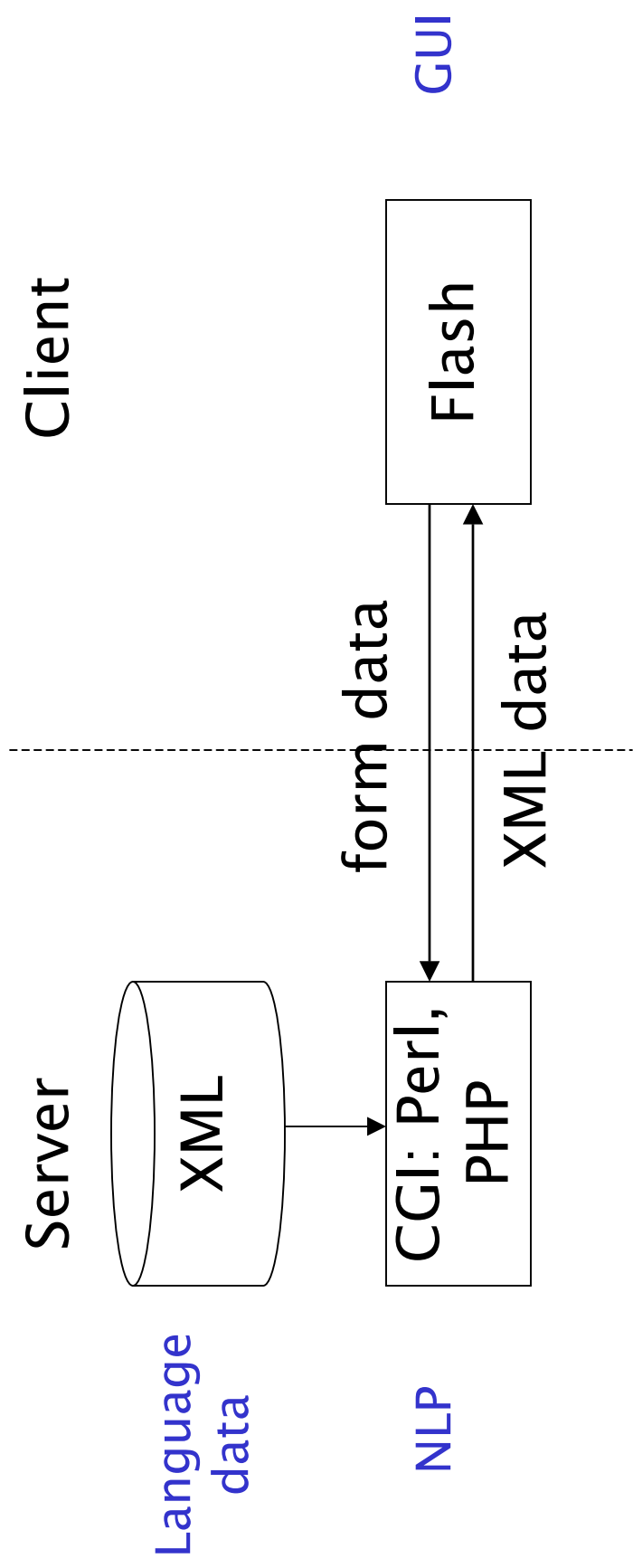


Plurilingual ICALL System

- NLP technologies
 - plurilingual error-sensitive island parser
 - animated grammar presentations
 - use of small, specialised corpora
- ICALL system features
 - ability to select languages of multi-lingual content
 - languages of instruction: English or German



Plurilingual ICALL System



Plurilingual ICALL System

- Re-use of technology
 - error-sensitive island parser for Spanish
 - corpora
- Learn from other projects
 - increasing language production skills (writing)
- Learner-centred
 - explorative learning
 - evaluation platform for continuous assessment



Artificial Co-Learner

- Target learner
 - intermediate to advanced learner of German and English
- Idea
 - exploit inherent limitations of NLP to our advantage
 - the advanced learner “teaches” the artificial co-learner when it makes errors with the L2
 - improve both the human’s and computer’s L2 knowledge

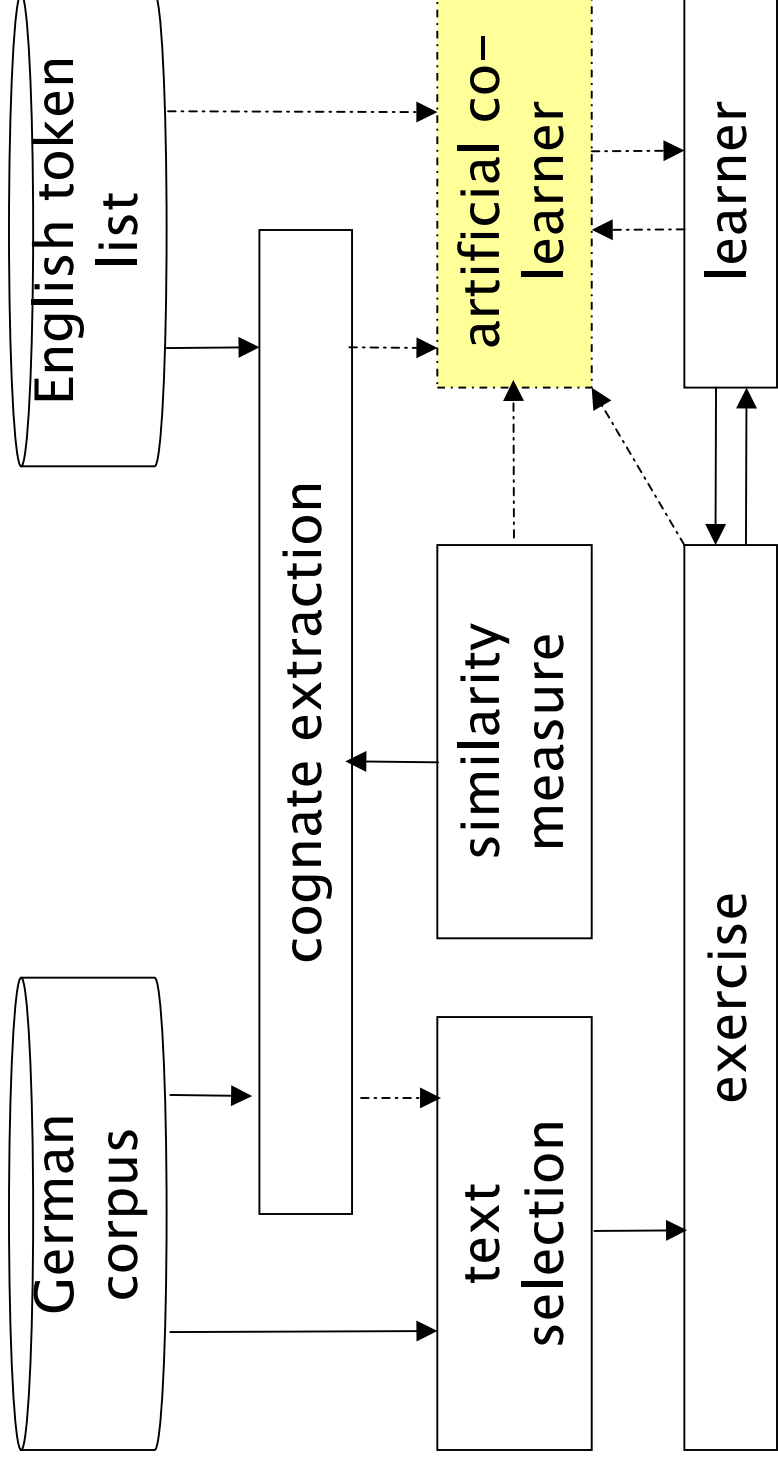


Artificial Co-Learner

- NLP technologies
 - lemmatisation, POS tagging
 - string similarity measure
 - corpus processing tools
- ICALL system features
 - a tool to automatically create “Cognate and False Friends” learning exercises for the learner



Artificial Co-Learner



Artificial Co-Learner

- Re-use of technology
 - IMS TreeTagger
 - standard string similarity measure
- Design for Evaluation
 - record time spent by learner
 - questionnaire
 - preliminary evaluation with 6 subjects



ICALL in the Primary School

- Two systems: Irish and German
- Target learner
 - 7 – 13 year old (male) pupils in Primary School
 - Target languages:
 - Irish: compulsory (7–13 year olds)
 - German: offered by some schools (10–13 year olds)
- Idea
 - limited L1 knowledge
 - “controlled” L2 knowledge

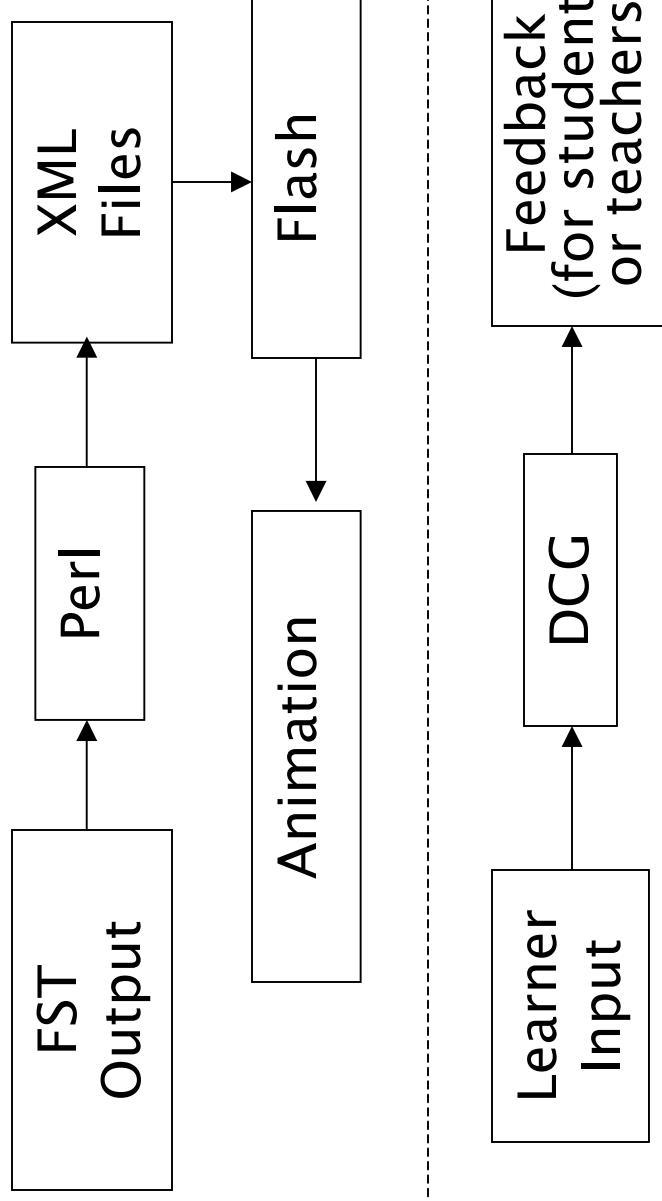


ICALL in the Primary School: Irish

- NLP technologies
 - FST morphology engine for Irish
 - simple, small coverage DCGs
- ICALL systems
 - automatically animated verb conjugations (FST, Perl, XML, Flash)
 - analysis of learner texts (DCGs)



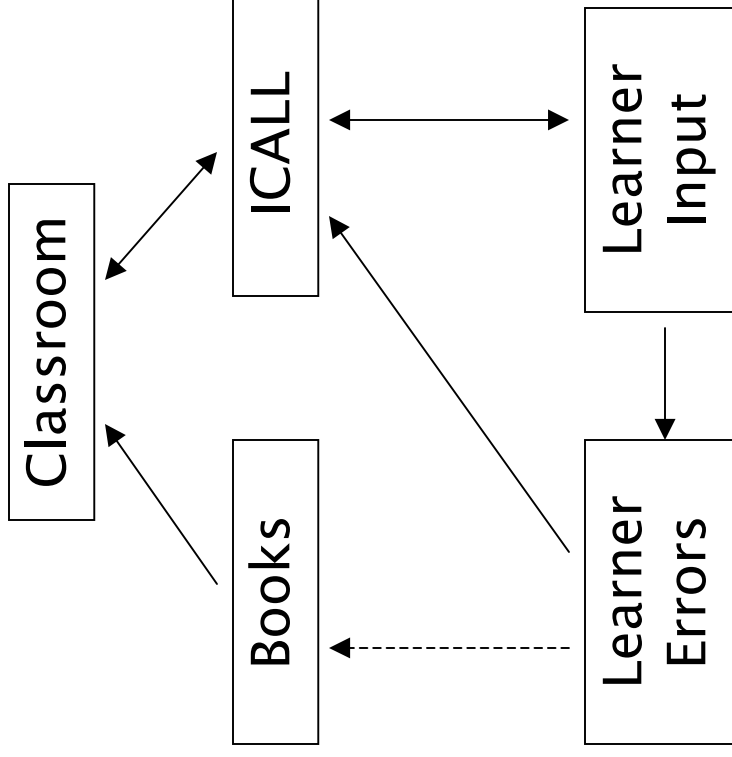
ICALL in the Primary School: Irish



ICALL in the Primary School: Irish

- no dictionary
- new words
- occurrences

- reading
- listening
- interactivity
- written production

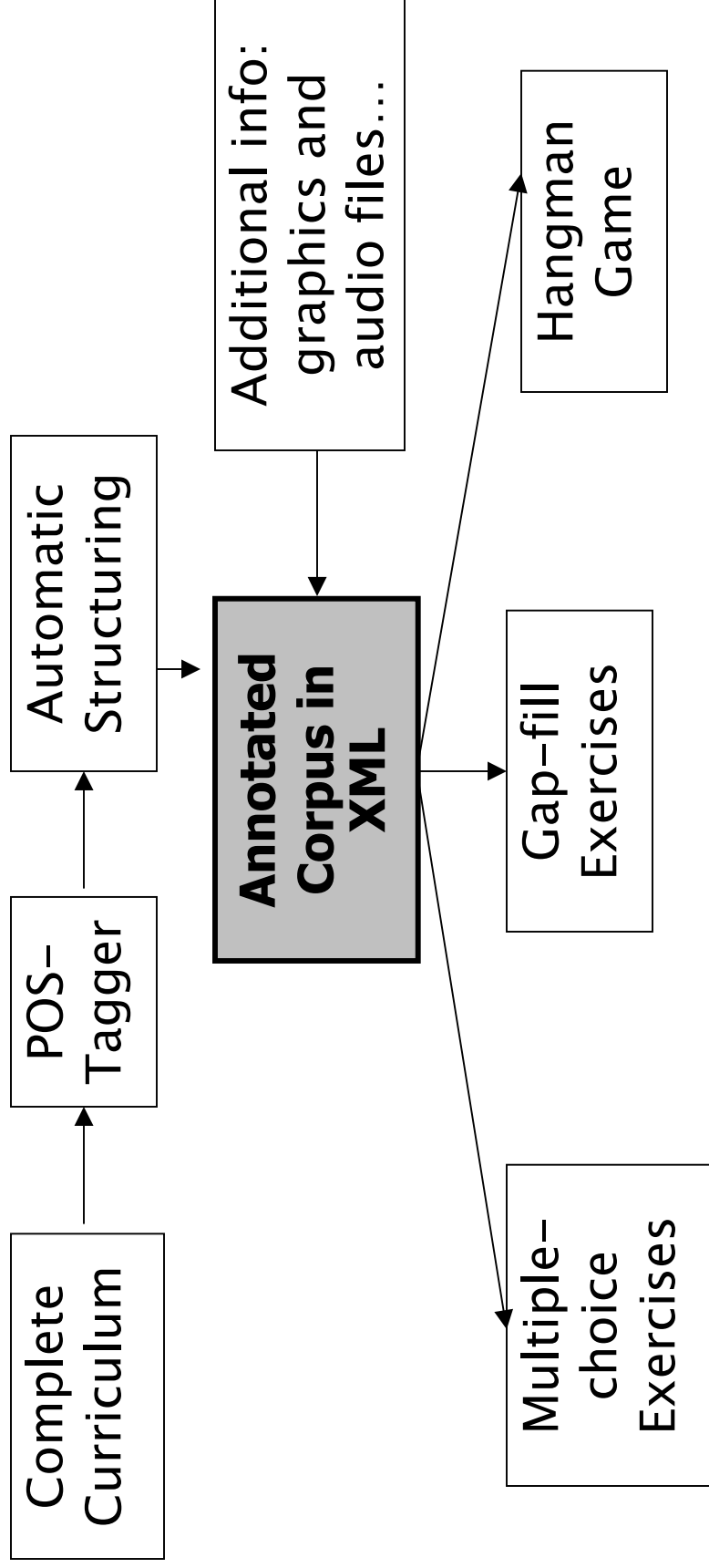


ICALL in the Primary School: German

- NLP technologies
 - POS tagger
 - tailored corpus
- ICALL system features
 - annotated XML corpus
 - based on NCCA guidelines for the curriculum
 - enhanced with texts, graphics and audio
 - tools to automatically create exercises



ICALL in the Primary School: German



ICALL in the Primary School

- Re-use of technology
 - FST morphological engine (Uí Dhonnchadha 2002)
 - DCG parser
 - POS tagger (IMS, Schmidt 1994)
 - in-house XML / Flash resources
- Assessment of available & relevant (I)CALL systems
- Learner- (& teacher-) centred approach
 - design for evaluation
 - in line with existing obligatory materials
 - limited L2 knowledge and time to prepare course materials



Conclusion

- Extensive re-use of existing NLP technologies
- Learn from other ICALL projects
- Learner-centred designs
- Design for concurrent evaluation
- NLP is useful not only for CALL for adult and advanced learners, but also for young and ab-initio learners
- Exploit / circumvent limits of NLP



Publications

- K. Keogh, T. Koller, M. Ward, E. Úí Dhonnchadha, & J. van Genabith. 2004. CL for CALL in the Primary School. eLearning for Computational Linguistics and Computational Linguistics for eLearning. International Workshop in Association with COLING 2004, Geneva, Switzerland.
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Thank You!

Discussion



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