

# IGT DETECTION

*A Machine Learning Approach to  
Sequence Labeling Task*

Sabrina Burleigh  
Ankit Srivastava

# OVERVIEW

- Label Set
- Feature Templates
- Beam Search
- System Modification
- Final System
- Conclusion



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# 3 LABELS

- First Line of IGT
- Remaining Lines of IGT
- Lines not IGT



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# BINARY FEATURES

- Presence of number or letter at beg. of line (e.g. “(1)” or “a.”) **IGTB**
- Presence of quote at beg. of line **IGTR**
- Presence of  $\geq 6$  spaces at beg. of line **IGTR**
- 2 features testing for gloss line **IGTR**  
(e.g. “bring-1sg”)  
(e.g. “cook-NM-DAT”)

# BASELINE

NB	PREC	RECALL	F-MEAS
EXACT	5.24	5.82	5.51
ALMOST	91.13	83.45	87.12

MAXENT	PREC	RECALL	F-MEAS
EXACT	16.19	26.62	20.14
ALMOST	74.69	93.29	82.96

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# BEAM SEARCH

- No Pruning
- Using topN: 0(default), 3, 5,10
- All other parameters set to default

MaxEnt	PREC	RECALL	F-MEAS
EXACT	0.57	3.80	0.99
ALMOST	21.90	100	35.93

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# MODIFICATION – 1.1

- Better mapping from classification results to IGT spans

NON\_IGT



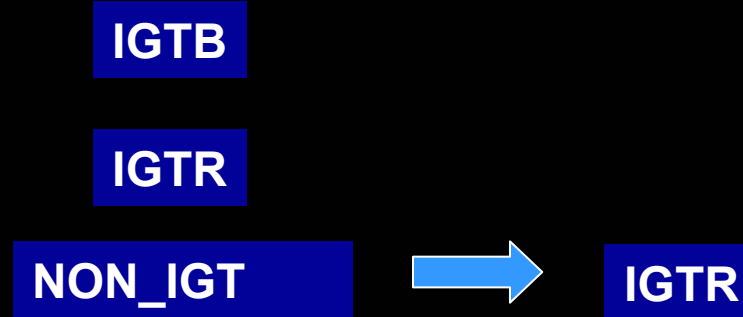
IGTB

IGTR

IGTR

# MODIFICATION – 1.2

- Better mapping from classification results to IGT spans



# MODIFICATION – 1.3

- Was not successful in span improvement
- Led us to implement gram detection

IGTB

NON\_IGT

IGTR



IGTR

# MODIFICATION – 1.4

- Don't count single IGT line

NON\_IGT

IGTB

NON\_IGT



NON\_IGT

# MODIFICATION – 1

- Results:  
28.42 % change on exact  
-9.12 % change on almost (due to 1.4)

	PREC	RECALL	F-MEAS
EXACT	62.77	39.60	48.56
ALMOST	97.88	59.78	73.84

# MODIFICATION - 2 IGTR

- Edited the Feature Template
- Gram Detection in the gloss line
  - Regexes for gram detection unreliable
  - Used grams file
  - Retain only 1 regex
- Added feature for presence of end-quote
- Changed # beg. spaces from 6 to 8 to prevent firing of NON\_IGT lines

# MODIFICATION - 3

- Used more training data
- Approx. half the files from \$hw5Dir/  
more\_training\_data
  - Training time increased with addition of features

# MODIFICATION

- Results of implementing all 3 modifications:  
24.51 % change on exact  
-14.17 % change on almost (due to 1.4)

	PREC	RECALL	F-MEAS
EXACT	53.61	38.26	44.65
ALMOST	81.15	58.51	68.79

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# BEST SYSTEM

- Modification – 1 (Post-processing)

	PREC	RECALL	F-MEAS
EXACT	62.77	39.60	48.56
ALMOST	97.88	59.78	73.84

# MORE TEST DATA

- Results consistent with first test set

	PREC	RECALL	F-MEAS
EXACT	50.29	40.82	45.06
ALMOST	75.15	57.77	63.80

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# CONCLUDING REMARKS

- What worked
  - Gram detection
  - Quote detection
  - Post-processing (span file)
  - More training data ??
- What did not work
  - Spaces at beg. of line
  - Gram regexes
  - Beam Search
- Difficulties
  - Yes