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SLOPE - Sentential LOgic ParsEr

HOW TO FAIL UPWARDS - ALEXANDER WALLIN & CHRISTIAN LINDGREN

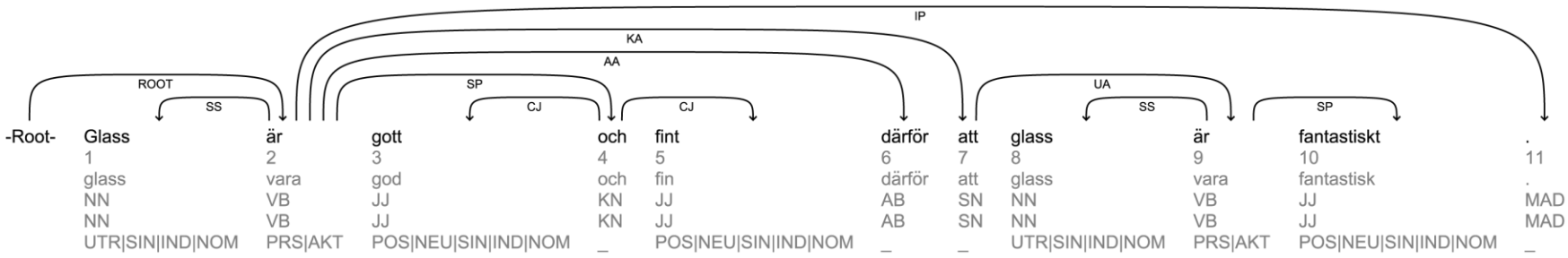
Hypothesis

- Argumentative text contains inherent logical structure
- Sentences are mapable to sentential logical rules
- Mapped sentences are logically validatable

NLP overview

- POS-tagging: Stagger
- Dependency parsing: MaltParser

- Glass är gott och fint därför att glass är fantastiskt.



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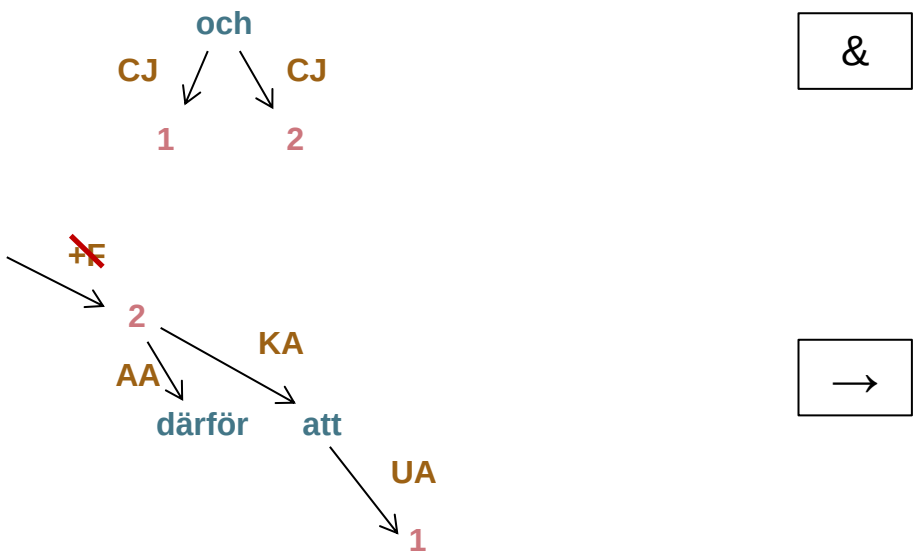
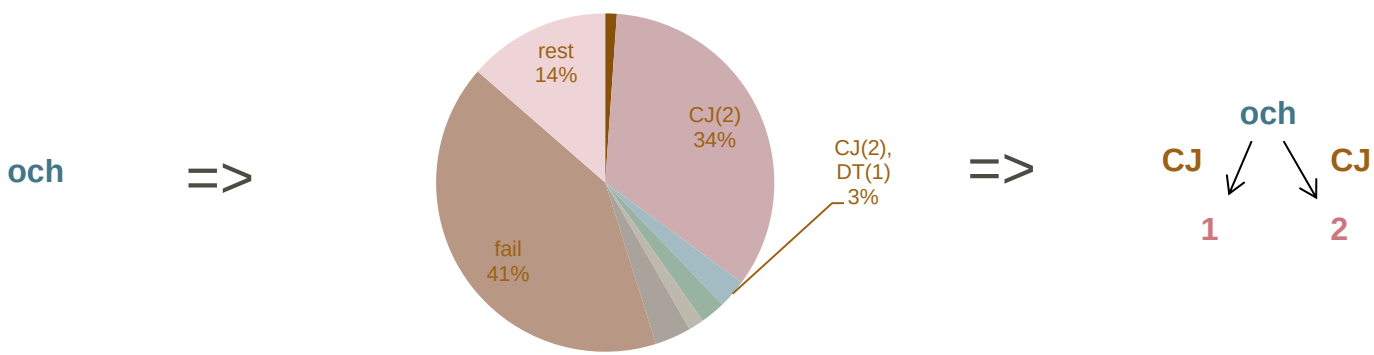
Modell

- Extract logical rules through cue word analysis



Method

- Choose a word with presumed logical meaning
- Group occurances by in-/out-going functional categories
- Evaluate each group for significance



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Validation

- $P_{correct}(x_1, \ldots, x_n) = \prod_{i=1}^{n} P_{correct}(x_i)$

Word(s)	Operator	Occurrances	Used #	Used %	$P_{correct}$
och	&	1 476 511	903 357	61%	30%
eller	|	81 614	66 499	81%	>95%
därför att	→	3 040	1 386	46%	50%
ger	→	20 647	760	4%	70%
är	:=	401 936	120 049	30%	90%
inte	¬	369 156	368 764	100%	20%

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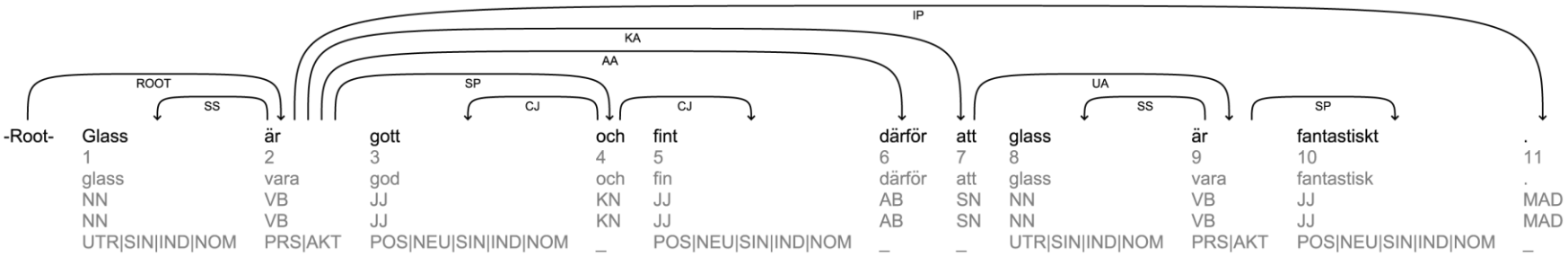
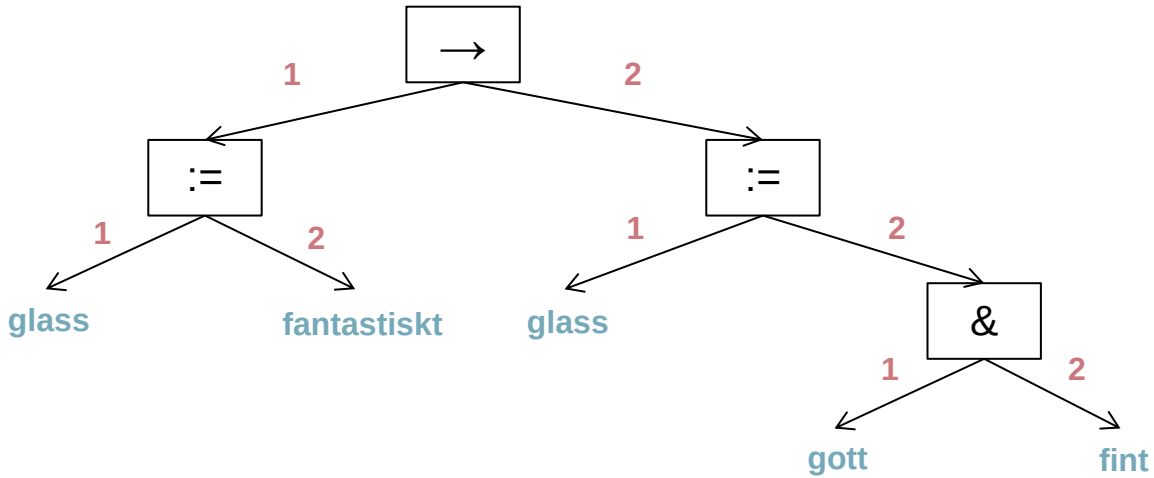
Example

- Glass är gott och fint därför att glass är fantastiskt.





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Demonstration

- See and behold

Hypothesis - validation

- Argumentative text contains inherent logical structure
  - Seems correct for swedish, given correct use of the language
- Sentences are mapable to sentential logical rules
  - To some extent, but there is a trade-off between false positive, coverage and narrow rules
- Mapped sentences are logically validatable
  - By the previous asumption a sentence can be validated with a certain probability

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Going forward

- Model is still somewhat brittle, need more rules
- Methodology is manual, automate process

- Support automatic information extraction
- Combine with entity extraction for argument validation

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