Melbourne Site Update

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Talk Outline

1. Supertagging with Hierarchical Tagsets
2. Phenomenal Corpus
3. Dialect Classification
4. Typediff

Supertagging with Hierarchical Tagset: Background

- There has been plenty of work on supertagging for various reasons (robustness, efficiency, ...), but the standard assumption has been that that tagset is "flat"
- With HPSGs, there is, of course, lots of structure to the supertags (= lexical types) that, intuitively, it would appear we should be able to use to good effect
- **Research question:** can we improve the accuracy of supertagging via cleverer user of the type hierarchy?

Supertagging with Hierarchical Tagset: Basic Approach

- Extract type hierarchy from a grammar (focusing exclusively on the ERG for now), and Rebecca-style supertag data
- Also experiment with Penn POS tagging, and shallow-fragmented hierarchy defined by Penn POS tags
- In the first instance focus on supervised learning
- Evaluate in terms of both supertagger accuracy and (ultimately) the impact on parse selection accuracy
- Basic Method: supertag "backoff" using the type hierarchy and trigram HMM (interpolate up the type hierarchy)

Supertagging with Hierarchical Tagset: Details I

- Propagate counts up the lexical type hierarchy to ancestor nodes, and interpolate between child and parent transition probabilities:

$$p_n^{HI} = (1-\alpha) \times p_n^{C} + \alpha \times p_n^{AV}$$

where:

$$p_n^{AV}(t_i|t_{i-n}) = \frac{1}{Z} \sum_{s_{i-n}^i \in \mathcal{P}(t_{i-n}^i)} p_n^{P}(s_{i-n}^i|s_{i-n}^{i-1})$$

where Z is a normalising constant

- Also smoothing of emission probabilities

Supertagging with Hierarchical Tagset: Details II

- And does it work? not terribly well, because:
  - experiments only based on 1-ancestors (which account for only 7% of errors)
  - experiments only based on bigram HMM (expect to get more out of a trigram HMM)

Talk Outline

Basic Idea

- **Phenomenal corpus:** corpus with extent-based markup of a range of phenomena (passive voice, interrogative clauses, imperative clauses, relative clauses and complement clauses)
- **Progress:** a first-version corpus exists, and we are about to start running experiments attempting to automatically identify the extents of different phenomena in text data

Talk Outline

Basic Idea

- **Context:** VarDial 2014 sentence-level classification of dialect/language variant, focusing on AmE vs. BrE
- **Hypothesis:** ERG-based supertagging will help in dialect classification (e.g. *meet Thursday*, *in hospital*)
- **Approach:** use language identification to determine the EN documents, and subclassify using features including supertags

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- **Context:** VarDial 2014 sentence-level classification of dialect/language variant, focusing on AmE vs. BrE
- **Hypothesis:** ERG-based supertagging will help in dialect classification (e.g. *meet Thursday*, *in hospital*)
- **Approach:** use language identification to determine the EN documents, and subclassify using features including supertags
- **Harsh reality:** supertags hinder rather than help, although:
  - unlexicalised supertags
  - some issues with the data

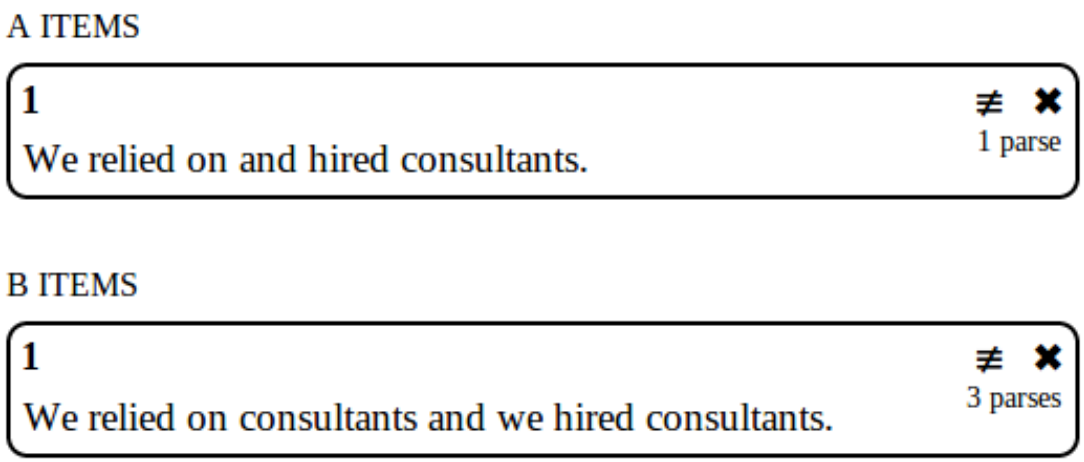
Talk Outline

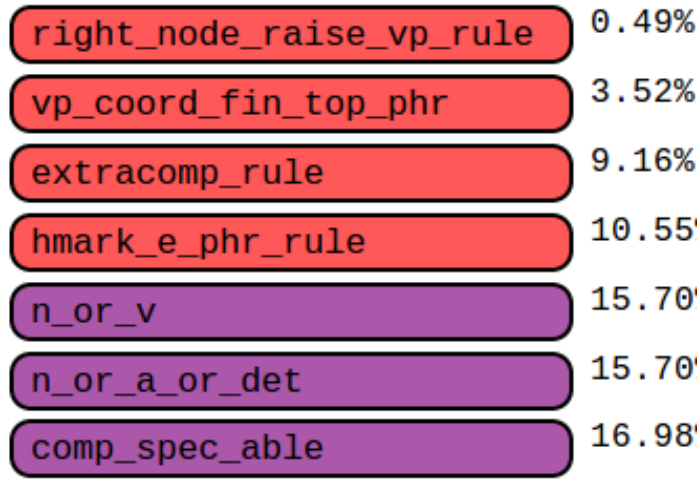
Typediff

- A browser-based tool enabling rapid exploration of all types from the type hierarchy involved in the parsing of input text
- Aim:
  - identify which types from a grammar pertain to the analysis of specific linguistic phenomena
  - contrast phenomenon-positive sentences with similar phenomenon-negative sentences
- Applications:
  - Exploring candidate type signatures for phenomenon detection
  - Phenomenon-based navigation of TDL files
  - Grammar documentation
  - Others?

Methodology

1. Input fragments are parsed with ACE
2. Every type from full AVM of the best parse is extracted
3. Each input fragment is treated as a bag of type names
4. Positive (A) fragments can then be contrasted with negative (B) fragments using set difference
5. Resultant types organized by HPSG theoretic categories (eg `sign`, `synsem`, `head` etc) and sorted by % of gold trees that made use of them





- Other features
  - Fragments can be added if phenomenon can't be captured with minimal pair
  - Relevant tree(s) can be selected from the parse forest
  - Can show differences across inherited supertypes
  - Supports diffing analyses produced by different grammar versions
  - Interfaces with existing DELPH-IN resources
    - Lexical Type Database
    - Fangorn
- Grammars supported
  - ERG, GG, Jacy, HaG, NorSource
  - Requirements: Grammar configured for ACE; any preprocessor runs independently of logon installation
  - Ask Ned if you want your grammar supported
- Homepage: `http://moin.delph-in.net/TypediffTop`
- Live demo