Towards Cross-language WSD for Quechua

Alex Rudnick (alexr@cs.indiana.edu)
School of Informatics and Computing, Indiana University

Contributions

- Can do cross-language WSD for Spanish-Quechua adjectives. Slightly beat a high baseline.
- Cataloging some available Spanish-Quechua tools and resources
- Reusable open source software

About Cross-Language WSD

- Classification task: predict correct translation using source language text
- "word senses" constrained by distinctions in target language
- Useful for translation, increasingly used in MT

Quechua

- Some 10 million speakers in the Andes mountain range
- Under-resourced, no available high-quality MT
- Morphologically rich, except for adjectives
- HLTDI is developing morphological analyzer and MT system



Resources

- Spanish-Quechua dictionaries
- Catholic Bible
- NLTK

Rudnick

- FreeLing
- Stories and elicitation corpus from AVENUE

Wordnet for Spanish

- Free version is fairly sparse
- Reusable software to query it from Python

KNN with Wordnet Similarity

- Find words in the local context with similar wordnet entries.
- Count hops in the hypernymy graph.

Cross-Language Simplified Lesk

- Look up Quechua dictionary entries for target adjectives
- Count matching Spanish words in source sentence

General-purpose Classifiers

- Word context features
- Dependency parses from FreeLing help slightly
- Decision trees, Naïve Bayes, KNN
- Can only beat baseline by disagreeing with it

Results

| classifier | features | accuracy | |
|-----------------|--------------------|----------|--|
| MFS baseline | training instances | 76.1 | |
| | corpus | 69.1 | |
| | other stories | 61.7 | |
| | uniform guess | 38.9 | |
| Simplified Lesk | | 65.9 | |
| decision trees | words | 76.6 | |
| | words, wn | 76.0 | |
| | words, parse | 77.2 | |
| KNN | words | 77.6 | |
| | wn | 75.3 | |
| | words, wn | 77.2 | |
| | words, parse | 77.6 | |

Future Work

- Generalize to other parts of speech
- Integrate with our MT system
- Disambiguate whole phrases
- Next languages: English, Guaraní, Amharic?