HeidelTime at TempEval-3
Tuning English and Developing Spanish Resources
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Motivation
Temporal Tagging
• extraction & normalization of temporal expressions

Main Challenge
• normalizing relative and underspecified expressions

News [1998-04-18]
... for the United States, he said today. ... On May 22, 1995, Farkas was made a brigadier general, and the following year ... However, cited by police in December for driving under the influence of alcohol ...

Different Domains [1]
• pose different challenges
• require different strategies

Existing Approaches
• focus on English
• focus on news documents

Narrative [2009-12-19]
[1979] Soviet invasion ... land in Kabul on December 25 ... they were complying with the Treaty of Friendship ... entered Afghanistan from the north on December 27. In the morning, the 103rd ...

HeidelTime: a multilingual, cross-domain temporal tagger
Key Features [2]
• rule-based system
• required: sentence, token, and POS information

Languages
• resource interpreter
• domain-dependent normalization strategies
• reference time
• relation to reference time

TempEval-3
Temporal Tagging (Task A)
• English and Spanish news documents
• annotation according to TimeML

Evaluation
• strict and relaxed extraction
• type and value normalization
• ranking attribute: value F1 (relaxed)

From HeidelTime 1.2 to 1.3
• improved weekday normalization
• annotations closer to TimeML

Developing Spanish Resources
Four Steps to Add a New Language:
(1) Preprocessing:
• sentence, token, PoS information
• HeidelTime uses TreeTagger
• Spanish TreeTagger module available

(2) Translation of Pattern Files:

(3) Translation of Normalization Files:

TempEval-3 Evaluation Results
English

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<th>strict F1</th>
<th>relaxed F1</th>
<th>value F1</th>
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<td>90.30</td>
<td>77.81</td>
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<td>HeidelTime 1.2</td>
<td>78.07</td>
<td>86.99</td>
<td>72.12</td>
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Spanish

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Summary
• English: 8 teams, 21 submissions
• Spanish: 3 teams, 3 submissions
• HeidelTime best system for English & Spanish for extraction + normalization

Error Analysis & Conclusions
False Negatives
• expressions that cannot be normalized with high probability (some time)

False Negatives / False Positives
• trade-off due to X_REF expressions; annotated inconsistently (currently)

Incorrect Value Normalization
• due to partial matches
• incorrect relation to reference time

Spanish Resources
• benefit from high quality English resources as starting point
• contain many patterns and rules not in Spanish training data

Availability
HeidelTime’s Current Version
• as UIMA component
• as standalone version (Java)
• online demo
• @ Google code

Languages
• English, German, Dutch, Spanish, Italian, Arabic, Vietnamese

Ongoing Work
• further languages to come

References

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