Short-Term Meaning Shift: A Distributional Exploration

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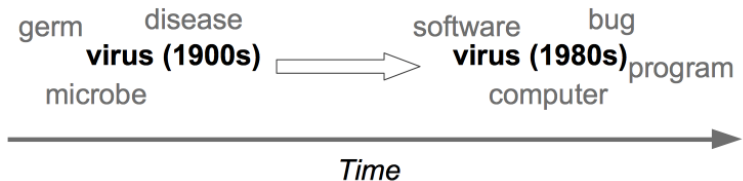⋄ Universitat Pompeu Fabra

NAACL-HLT 2019

Some words change meaning in time

Meaning Shift

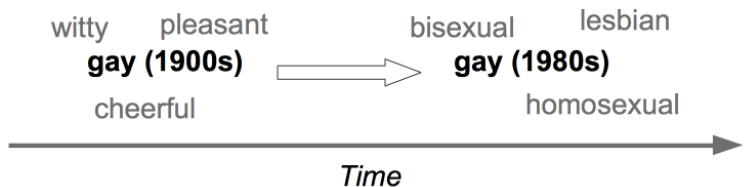Some words change meaning in time

Increasing attention in NLP on this phenomenon
Kulkarni et al.(2015), Hamilton et al.(2016), Frermann and Lapata(2016)

Meaning Shift

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Long-Term Meaning Shift

Meaning Shift

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?

Meaning Shift

*Damn, after loosing the **F5** key on my keyboard ...*   16 Jun

*He is so close, **F5** tapping is so intense now!*   18 Jun

*Don't think about it too much, man. Just **F5**!*   1 Jul

*I slept and just woke up and thought it was **F5** time*   3 Jul

*This was a happy **F5**!*   3 Jul

Meaning Shift

*Damn, after loosing the **F5** key on my keyboard ...* 16 Jun

*He is so close, **F5** tapping is so intense now!* 18 Jun

*Don't think about it too much, man. Just **F5**!* 1 Jul

*I slept and just woke up and thought it was **F5** time* 3 Jul

*This was a happy **F5**!* 3 Jul

*What is an **F5**?* 3 Jul

Short-Term Meaning Shift

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A rapid change in the ontological type that a word denotes

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In an online community: where the genesis and spread of new meanings takes place

Short-Term Meaning Shift

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Contributions:

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❶ Create a dataset annotated for short-term meaning shift

Short-Term Meaning Shift

Contributions:

1. Create a dataset annotated for short-term meaning shift

2. Assess the performance of a standard model for meaning shift

Dataset

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- User-generated content from the Reddit football community
  r/LiverpoolFC

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- Two time bins: 2013 and 2017

- 100 words annotated by members of the community

- For each word, a *semantic shift* index in range [0-1]

Types of Shift

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Metonymy:
- *"we are playing with the highlighter today"*

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Metaphor:

- *"you boys know how to shovel coal!"*

Types of Shift

Metonymy:
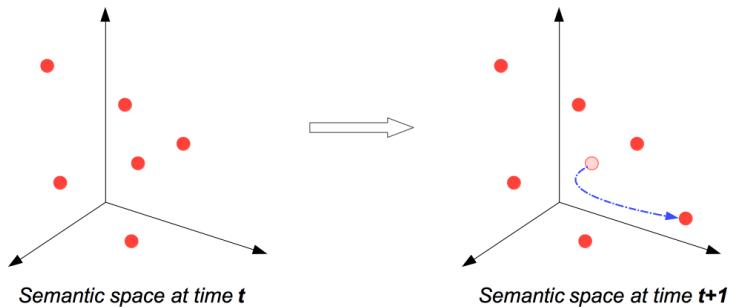- *"we are playing with the highlighter today"*

Metaphor:
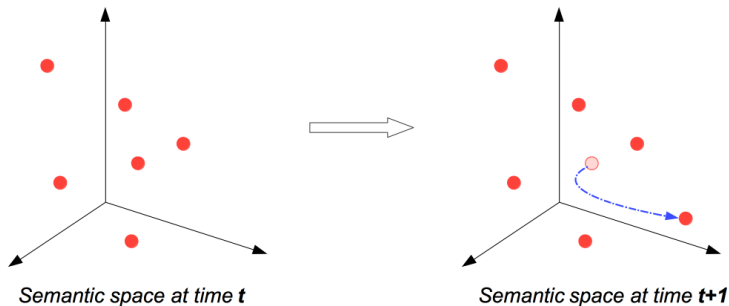- *"you boys know how to shovel coal!"*

Meme:
- *"Rumour has it Van Djik was wearing these vans in the van"*

Model

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Semantic space at time *t*

Semantic space at time *t+1*

Model

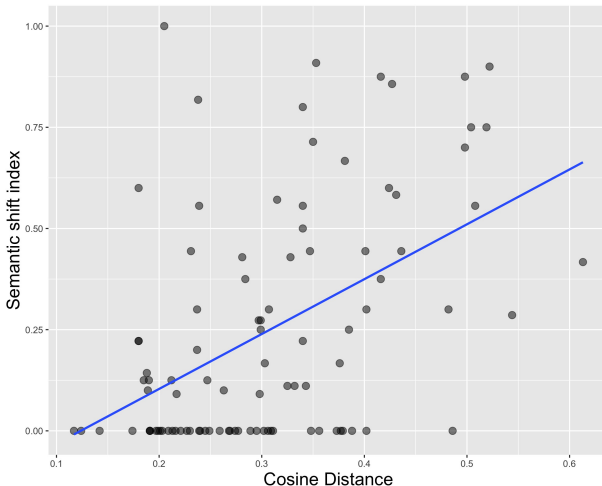*Semantic space at time **t***   *Semantic space at time **t+1***

- Kim et al (2014) - Based on Word2Vec
- Representations at time t are used to initialize those at $t+1$
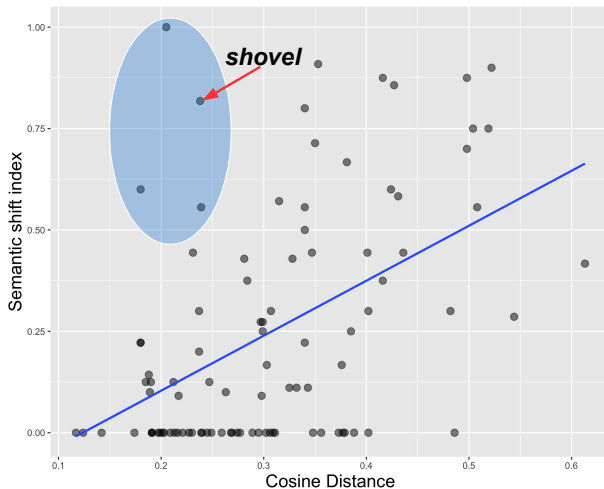
Results

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Positive correlation between cosine distance and shift index
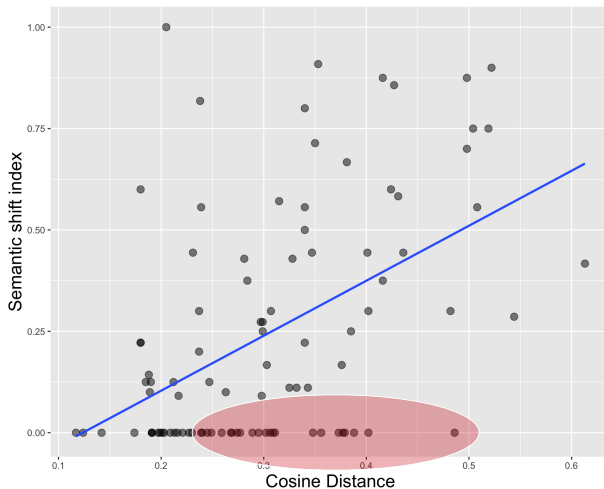$\rightarrow$ The model captures short-term shift

Results

Systematic deviations: false negatives

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Systematic deviations: false positives

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Systematic deviations: False Positives

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- '*independence*', to refer to political facts in Catalunya (2017)

$\rightarrow$ The model correclty spots the context change, but it is not sensitive to its nature.

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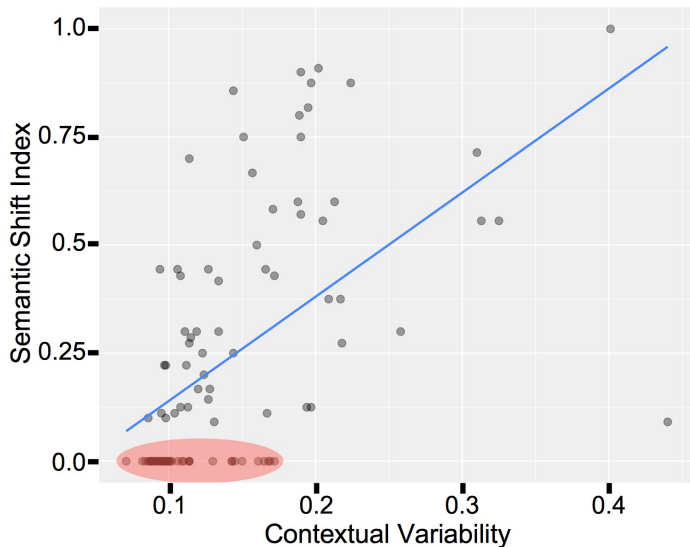
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Intuition: referential cases have narrower contexts of use, compared to 'real' meaning shift

Measure of *contextual variability* to capture this intuition

$\rightarrow$ contextual variability is correlated with semantic shift

Contextual Variability

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Thanks