

Learning a Theory of Marriage (and other relations) from a Web Corpus

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Motivation

- Long-term goal of NLP: Natural language understanding (just like humans do!)
- NLP has been very successful at interpreting individual words, sentences and documents:
 - POS tagging
 - Syntactic parsing
 - Semantic parsing
 - Word sense disambiguation
 - Co-reference resolution
 - ...

But texts contain much more information than is stored on the surface level

Can we infer some of this knowledge using NLP methods and make it available to the computer?

Idea

How do humans learn what a concept such as „marriage“ typically involves?

Various possibilities:

- Look it up in a dictionary
- Ask other people
- Wait for the right person and give it a try yourself
- Look at other married couples and observe what they're doing...

Computers can't yet fall in love, but they can crawl texts quite well!

Let's have a look at the whole web and what it tells us about married couples!

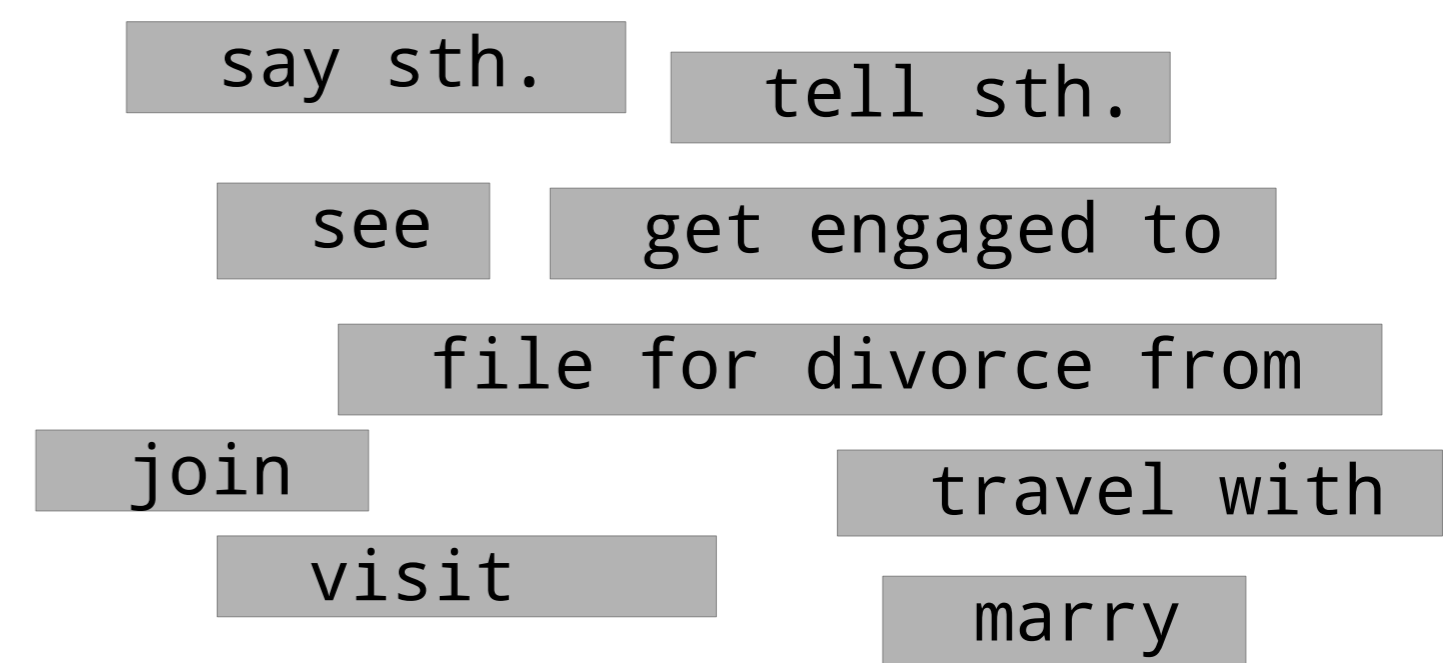
Resources used

- **Web corpus** ClueWeb09: 2 TB compressed – a good portion of the WWW on disk
- Freebase (a state-of-the-art **knowledge base** with structured information about 2 million people)
- Lots of processors

Extraction of relations from the corpus

- Compile a list of all married couples in the knowledge base
- Crawl the web corpus and look for sentences which contain the names of two married people
- Extract the **relation** the two people are in
- Requires a lot of NLP machinery
 - Boilerplate removal
 - Splitting documents into sentences
 - Tokenisation
 - POS tagging
 - Dependency parsing
 - ...

Output



Applying a weighting scheme

That looks great, but is this what we typically have in mind when we think about marriage?

Not quite. Not only married people meet and visit each other!

Aim: Work out which relations are specific to married couples

Idea: Use a parsed background corpus and look how many instances there are

Results:

Typical of marriage

be someone's wife
 be engaged to
 date
 meet
 divorce
 file for divorce from
 tie knot with
 love
 expect child with

Less typical

hit someone
 defend
 remember
 turn to
 rejoin
 promise sth.
 bury
 remind
 look at

