Topics, Administration

Katja Markert (some images by Katia Shutova)

Heidelberg SS2019
Overview

- Background
- Motivation
- Topics
- Administration
Overview

1 Background

2 Motivation

3 Topics

4 Topics: Metaphor Recognition
‘Les Tropes sont des figures par lesquelles on fait prendre à un mot une signification qui n’est pas précisément la signification propre de ce mot’

DuMarsais, Cesar Chesneau and Douay-Soublin, Françoise (1730): Des Tropes où des Différents Sens

‘Trope: […] jede Form der Rede, die das Gemeinte nicht direkt und sachlich durch das eigentl. Wort ausspricht, sondern […] durch e. Anderes, Naheliegenderes, e. ‘‘übertra- genen’’ Ausdruck wiedergibt.’

Different Types

- **Metaphor**: Transferral via Similarity. Establishing a comparison. *sweet child*

- **Metonymy**: Transferral via world knowledge relations. *traumatised by Vietnam*

- **Idioms**: fixed, conventionalised and non-compositional multiword phrases. *break the ice*

- **Ironic/Sarcasm**: Say opposite of what you mean but mark it for the hearer to recognise. *I love being woken up at 5am by drilling*

- **Hyperbole**: *He told me that a million times.*
Different Types

- **Metaphor**: Transferral via Similarity. Establishing a comparison. *sweet child*

- **Metonymy**: Transferral via world knowledge relations. *traumatised by Vietnam*

- **Idioms**: fixed, conventionalised and non-compositional multiword phrases. *break the ice*

- **Ironic/Sarcastic**: Say opposite of what you mean but mark it for the hearer to recognise. *I love being woken up at 5am by drilling*

- **Hyperbole**: *He told me that a million times.*
Different Types

- **Metaphor**: Transferral via Similarity. Establishing a comparison. *sweet child*

- **Metonymy**: Transferral via world knowledge relations. *traumatised by Vietnam*

- **Idioms**: fixed, conventionalised and non-compositional multiword phrases. *break the ice*

- **Irrony/Sarcasm**: Say opposite of what you mean but mark it for the hearer to recognise. *I love being woken up at 5am by drilling*

- **Hyperbole**: *He told me that a million times.*
Different Types

- **Metaphor**: Transferral via Similarity. Establishing a comparison. *sweet child*
- **Metonymy**: Transferral via world knowledge relations. *traumatised by Vietnam*
- **Idioms**: fixed, conventionalised and non-compositional multiword phrases. *break the ice*
- **Ironic/Sarcasm**: Say opposite of what you mean but mark it for the hearer to recognise. *I love being woken up at 5am by drilling*
- **Hyperbole**: *He told me that a million times.*
Different Types

- **Metaphor**: Transferral via Similarity. Establishing a comparison. *sweet child*
- **Metonymy**: Transferral via world knowledge relations. *traumatised by Vietnam*
- **Idioms**: fixed, conventionalised and non-compositional multiword phrases. *break the ice*
- **Irony/Sarcasm**: Say opposite of what you mean but mark it for the hearer to recognise. *I love being woken up at 5am by drilling*
- **Hyperbole**: *He told me that a million times.*
Figurative Language can be very innovative or pretty conventionalised.

Conventionalised:

“I didn’t know it at the time, but behind the scenes Evan had to pull strings in order to hire me. “

Stone (2014): Things a little bird told me

or is it?

“I didn’t know it at the time, but behind the scenes Evan had to pull strings in order to hire me. Actually they were more like ropes. Or cables — the kind that hold up suspension bridges. “

Stone (2014): Things a little bird told me
Figurative Language can be very innovative or pretty conventionalised.

Conventionalised:

“I didn’t know it at the time, but behind the scenes Evan had to pull strings in order to hire me. “

Stone (2014): Things a little bird told me

or is it?

“I didn’t know it at the time, but behind the scenes Evan had to pull strings in order to hire me. Actually they were more like ropes. Or cables — the kind that hold up suspension bridges. “

Stone (2014): Things a little bird told me
Vehicle/Source: Domain from which the transferral takes place. *sweet* or the domain of taste in *sweet child*.

Tenor/Target: Domain to which you transfer. *child* or the domain of character/personality in *sweet child*.

Mostly applicable to metaphor (and metonymy)
Up to now: **linguistic metaphors**

But categorisation is essential for metaphors (and metonymies)

"Our ordinary conceptual system, in terms of which we both think and act, is fundamentally metaphorical in nature."

*Lakoff und Johnson (1980): Metaphors we live by*
Conceptual metaphors

Relate two cognitive domains systematically

**Argument is War** is a conceptual metaphor between source domain *war* and target domain *Argument*. Instantiated via linguistic metaphors such as

- *He attacked my position.*
- *They bombarded me with counter-arguments*
- *Ich habe aber gleich zurückgeschossen.*

Leads to structural analogies such as

- argumentative positions = positions in a war
- people who argue = soldiers
- counter-arguments = weapons
- making up = peace
Seminar focus

- Metaphor recognition (focus of most work)
  - Approaches on short phrases (abstractiveness, multilingual, multimodal . . .)
  - Neural approaches on metaphors in full context
- Metaphor interpretation. Can we just paraphrase? *sweet child* → *kind child/friendly child*
- Applications: MT, educational applications, sentiment mining
- Recognition and interpretation of metonymies
- Recognition of irony: social networks, world knowledge, context
Overview

1 Background

2 Motivation

3 Topics

4 Topics: Metaphor Recognition
Inferences and *entailment* vary between literal and metaphorical meanings

- *They attacked our houses* $\rightarrow$ probably property and/or person damage
- *They attacked my arguments* $\rightarrow$ no physical damage

Most extreme for irony!
Why are we interested in figurative language: Cognition

Thibeadeau und Boroditzky (2013, 2011):

Beispiel

Crime is a beast/virus ravaging the city of Addison. Five years ago Addison was in good shape, with no obvious vulnerabilities. Unfortunately, in the past five years the city's defense systems have weakened, and the city has succumbed to crime. Today, there are more than 55,000 criminal incidents a year - up by more than 10,000 per year. There is a worry that if the city does not regain its strength soon, even more serious problems may start to develop.

- Increase street patrols that look for criminals.
- Increase prison sentences for convicted offenders.
- Reform education practices and create after school programs.
- Expand economic welfare programs and create jobs.
- Develop neighborhood watch programs and do more community outreach.
Potential Applications

that we no longer believe in hell, and that mutes, carrying black ostrich plumes, are out of favour. The changes have been more fundamental and some of them may have affected us in ways that we do not immediately recognize. All centuries, of course, have brought constants of change; but few would deny that in the nineteenth century “hope was greatly accelerated,” that change was apparent to the most conceptive of those living at that time. Some felt that they were entering into an epoch of unprecedented enlightenment, in which better education and beneficent technology would ensure wealth and leisure for all. This was Harriet Spencer’s view, namely that an “inward evolutionary process was inherent in the human condition. To others, including Tennyson and Arnold, it seemed as if “the whole string of changes” were carrying them on “swift-footed speed into a new-lens view of society and class.” Browning was more hopeful, but he, too, was aware of the “jittery” and “nervous” quality of his time; of the “shaking and the rose sigh.” “Peace——was the cry. Out the eye-warp ‘Gaze——I flake! ’ The philosophical position was that the community could be turned into a new age of utopianism. They tried to “revive the fading trumpet and ‘revive it’ stay. Cohums and historical periods differ greatly in their concepts of time and the continuity of life. No line in a “new-century invented” on the present, which regards the new past as little more than the presentized from which we extract hundreds of our very own. But hope is for surfaces, in the century of youth. Earlier centuries, in contrast, had an appreciation of the past that emphasized the many meanings and aspirations past. A nation and experience were valued in the belief that the length of days had provided some guidance on how to live and what to expect in the life to come. For the “century,” on earth of each individual was not a happily complete in itself, but now a realization of another “sum of extinctions” was the “reviving” to that unaided soul was death. “More than ever before,” as the memorial tablets had it. This belief was fostered by the churches, the floors and walls of which were incised with the records of those who had gone before, but it was expressed positively in the family. Families cherished their forefathers, whether those had lived in humble cottages or in manor houses. Some applied them to their family’s history or to one. The landed gentry “revived” for their grandaditions some of the heritage that they themselves would never see in this modern century this knowledge was in the “reigns of centuries” of the present, but it was a “reign of years” of the present. It was a “reign of the years” a reign of the years, it was a reign of the years. Young men with fatness, provided by the Industrial Revolution, were one generation, they were the revolution of the youth of the century. Growing more acquisitive as it was possible, they prepared to “revive and the past; the future was to be different, both for themselves and their children, and they had to recover to catch up with a improving life expectancy gave him the hope of doing so, especially if they belonged to the “reviving” application. For the middling-class was the agent and producer of these changes. “The rise of the middle-class was not, on the whole, produced on an acquisition to join the aristocracy,” whose way of life, especially during the Regency, “revived with a good deal of detachment,” but it was determined by the results intention of the men to “revive the past,” every possible way from the social-class, out of which so many of them had raised themselves. Their rise during the Industrial Revolution was expressed in capital accumulation; the status of the aristocracy still derived from birth and ownership of land. The new men were not so the landed gentry: they were “reviving” the aristocracy, but the aristocracy of the new middle-class, but there were two ideologies that substantiated in more active wares. The older one was that of the “reviving” application of the middle-class which was the basis of the Evangelicals, but there were certain social issues, such as ability of slavery, on which concerted action was possible. Macaulay was one of those who “revived a text in

Information Retrieval
Machine Translation
Sentiment Analysis
Educational applications
Text Simplification

Metapher in every third sentence! 11% of Tokens (Corpus studies)
Overview

1. Background

2. Motivation

3. Topics

4. Topics: Metaphor Recognition
More background on definition

Background on metaphor and inference as well as metaphor and cognition

**TSV - Tsvetkov et al (2014)**

Around 2000 adjective noun-pairs with train-test split

<table>
<thead>
<tr>
<th>Metaphor</th>
<th>Literal</th>
</tr>
</thead>
<tbody>
<tr>
<td>deep thought</td>
<td>cold weather</td>
</tr>
<tr>
<td>green energy</td>
<td>empty can</td>
</tr>
<tr>
<td>empty promise</td>
<td>dry skin</td>
</tr>
</tbody>
</table>

**MOH - Mohammad et al. (2016)**

647 Verb/subject/object pairs (10-fold CV)

<table>
<thead>
<tr>
<th>metaphor</th>
<th>literal</th>
</tr>
</thead>
<tbody>
<tr>
<td>absorb cost</td>
<td>attack village</td>
</tr>
<tr>
<td>breathe life</td>
<td>breathe air</td>
</tr>
</tbody>
</table>
Main dataset VU Amsterdam Metaphor Corpus. Ca 238K tokens of which 25K are metaphoric. Most conventional.


Example
he has become involved in a row over his attack on the Pharisees of British society

- Annotation Methodology: binary, best/worst . . . . Emphasis on methodology you can use for other seminars/theses as well.
- Innovative vs. Conventional (?)
- Can we annotate metaphors with high agreement?
Student Presentations

Start 29th of May!
Overview

1. Background
2. Motivation
3. Topics
4. Topics: Metaphor Recognition

Main ideas

- Lakoff/Johnson (1980): concrete domain to abstract domain: ARGUMENT IS WAR, BADNESS IS DARKNESS
- Calculate abstractness of a word
- Metaphoricity results from tension between, for example, an abstract noun and a concrete adjective

<table>
<thead>
<tr>
<th>Word</th>
<th>Abstr. rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>dark</td>
<td>0.43356</td>
</tr>
<tr>
<td>bad</td>
<td>0.63326</td>
</tr>
<tr>
<td>mood</td>
<td>0.61858</td>
</tr>
</tbody>
</table>

*bad mood* literal, *dark mood* metaphoric

- Koeper and Schulte im Walde (2016): German particle verbs

**Main Idea**
- Supervised Learning in source language on SVO and AN tuples
- Use conceptual features
- Transfer via bilingual lexicon: *schmutzig* $\rightarrow$ *dirty, filthy, grimy* . . .
- Average feature vectors of the translation. No retraining in new language

<table>
<thead>
<tr>
<th></th>
<th>SVO</th>
<th>AN</th>
</tr>
</thead>
<tbody>
<tr>
<td>EN</td>
<td>0.79</td>
<td>0.85</td>
</tr>
<tr>
<td>RU</td>
<td>0.84</td>
<td>0.77</td>
</tr>
<tr>
<td>ES</td>
<td>0.76</td>
<td>0.72</td>
</tr>
<tr>
<td>FA</td>
<td>0.75</td>
<td>0.74</td>
</tr>
</tbody>
</table>
Shutova et al. (NAACL 2016) *Black holes and white rabbits: Metaphor identification with visual features*

**Main Idea**

- \( \cos(w_1, w_2) \) with linguistic as well as visual embeddings (*bitter man*)
- Other models based on phrase similarities . . .

1. Under creative commons license, originator Tabish_q. 2. Under creative commons licence, originator Ananian
Rei et al (EMNLP 2017) *Grasping the Finer Point: A Supervised Similarity Network for Metaphor Detection*

Builds on Shutova et al’s core idea of cosine similarities. Expands this into a deep learning approach.

Example

he has become involved in a row over his **attack** on the **Pharisees** of British society

- A feature-based logistic regression baseline building on Klebanov et al (2016) still performs well
- All participants used some form of neural network. Not that many beat the baseline for all POS.
- Best performing system is a CNN/LSTM hybrid by Wu et al (2018)
Current state of the art is the sequence to sequence labeling model in Gao et al (EMNLP 2018): *Neural Metaphor Detection in Context*
T.I.3: Metaphor detection in running text (advanced)


- **Fully Annotated!**

![Bar chart](chart.png)

<table>
<thead>
<tr>
<th></th>
<th>CLS</th>
<th>SEQ</th>
<th>CLS</th>
<th>SEQ</th>
<th>CLS</th>
<th>SEQ</th>
<th>CLS</th>
<th>SEQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRECISION</td>
<td>53.4</td>
<td>65.6</td>
<td>71.3</td>
<td>69.7</td>
<td>58.9</td>
<td>69.1</td>
<td>81.4</td>
<td></td>
</tr>
<tr>
<td>RECALL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACCURACY</td>
<td>69.1</td>
<td>71.3</td>
<td>69.7</td>
<td>81.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

From Bollegala and Shutova (2013):
Several Options (see literature list):

- schizophrenia detection (Basis)
- metaphor and MT
- metaphor and sentiment (Basis)
Gritta et al (ACL 2017): Vancouver welcomes you! Minimalist Location Metonymy Resolution

Location metonymies relevant for geo-parsing as they are false positives:

- traumatized by **Vietnam**
- All **London** is going to the parade

Gritta et al combine an LSTM with syntactic knowledge for metonymy identification:
T.V.1: Irony recognition in social networks (Basis)

Ghosh et al (EMNLP 2015): *Sarcastic or not: word embeddings to predict the literal or sarcastic meaning of words* and

Gonzales-Ibanez et al (ACL 2011): *Identifying sarcasm in twitter: a closer look*
Methods

- **Distant supervision**: Tweets marked with #sarcasm, #irony or similar: positive Instances
- Other Tweets: negative
- Mostly supervised learning with features such as: emotion, lexical, emojis, embeddings...
- Is distant supervision adequate for the task?
T.V.2 Irony Recognition: The inclusion of context (Advanced)


**Speaker Utterance:** @MSNBC of course all of those jobs will be in China

**In reply to @realDonaldTrump:** I will be the greatest jobs-producing president that God ever created.

- Use tweet you reply to
- Use writers personality and mood as evinced by previous tweets

Figure 1: A Neural Architecture for Detecting Sarcasm in Contextualized Utterances
Riloff et al. (EMNLP 2013) *Sarcasm as Contrast between a Positive Sentiment and Negative Situation*. or Van Hee et al (CL 2018): *We usually don't like going to the dentist: Using common sense to detect irony on twitter*

**Example**

Thank you 2018 for the worst migraine ever. This is what I call a perfect beginning.

Collect negative situations:

- Riloff et al: bootstrapping
- Van Hee et al: Twitter crawls and knowledge bases