AMR at JHU Summer Workshop
Abstract Meaning Representation vs. Tectogrammatics

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- **ASR** Machines That Know When They Do Not Know; led by Hynek Heřmanský
- **PRELIM** Probabilistic Representations of Linguistic Meaning, led by Jason Eisner and Ben Van Durme
- **CLAMR** Cross-Lingual Abstract Meaning Representations for Machine Translation; led by Martha Palmer
  - Graph-theoretic team (Dan Gildea, David Chiang, Adam Lopez, Giorgio Satta, Naomi Saphra,...)
  - AMR Parsing team (Jeff Flanigan, Xiaochang Peng, Chuan Wang, Yuchen Zhang, Wei-te Chen,...)
  - Tecto-to-AMR team (Tim O’Gorman, Ondřej Bojar, Ondřej Dušek, Roman Sudarikov, Zdeňka Urešová, Silvie Cinková, Martin Popel,...)
Motivation for Tecto-to-AMR

- convert PCEDT and CzEng to AMR
  - much more (almost) manual data
  - much more parallel training data
- (yet another) pipeline for AMR parsing
- explore the differences between
  - AMR and Tecto
  - Czech and English AMR
The boy wants the girl to believe him.
The boy wants to be believed by the girl.
The boy has a desire to be believed by the girl.
The boy’s desire is for the girl to believe him.
The boy is desirous of the girl believing him.
The boy wants the girl to believe him.
The boy wants to be believed by the girl.
The boy has a desire to be believed by the girl.
The boy’s desire is for the girl to believe him.
The boy is desirous of the girl believing him.
AMR basics

Penman format

\[(w / want-01
   :\text{ARG0} (b / boy)
   :\text{ARG1} (b2 / believe-01
     :\text{ARG0} (g / girl)
     :\text{ARG1} b))\]

Triples format

\[
\text{instance}(w, \text{want-01})
\text{instance}(b, \text{boy})
\text{instance}(b2, \text{believe-01})
\text{instance}(g, \text{girl})
\text{ARG0}(w, b)
\text{ARG0}(b2, g)
\text{ARG1}(w, b2)
\text{ARG1}(b2, b)
\]
The boy saw the girl. The girl wants the boy.
The boy saw the girl who wanted him.
The boy saw the girl who he was wanted by.
The girl who wanted the boy was seen by him.
The boy saw the girl who wanted him.
The boy saw the girl who he was wanted by.
The girl who wanted the boy was seen by him.

\[(s / \text{see-01} \quad :\text{ARG0} (b / \text{boy}) \quad :\text{ARG1} (g / \text{girl} \quad :\text{ARG0-of} (w / \text{want-01} \\quad :\text{ARG1} b)))]\]
The girl who was seen by the boy wants him.
The boy is wanted by the girl he saw.
The girl wanted the boy who saw her.

(w / want-01
 :ARG0 (g / girl
  :ARG1-of (s / see-01
   :ARG0 (b / boy)))
 :ARG1 b)
AMR (v1.2) relations

Core :ARG0, :ARG1, :ARG2, :ARG3, :ARG4, :ARG5 (OntoNotes)

Coord :op1, :op2, :op3, :op4, ...


For details see http://amr.isi.edu/ and AMR guidelines.
What’s done

- 100 Czech sentences manually annotated with AMR
- Treex support (Read::Amr, TrEd visualization of t-amr layer)
- Tecto-to-AMR transformation using PML-TQ
- Tecto-to-AMR transformation using Tsurgeon
- NameTag trained for English (by Milan Straka, on BBN)
- feedback for Martha Palmer (light verb constructions)
- complex predications list (\textit{give blessing} $\rightarrow$ \textit{bless})
- verbalization list
  \textit{(beekeeper} $\rightarrow$ person :ARG0-of keep-01 :ARG1 bee)
- ...
Tecto-to-AMR: “Peter is eager to please”
Tecto-to-AMR: 1. Merging of Coreferent Nodes
Tecto-to-AMR: 2. Elimination of semantically light words
Tecto-to-AMR: 3. Semantic Roles and Senses

Diagram of semantic roles and senses for the sentence:

Peter is eager to please.

- **eager** is the verb.
- **Peter** is the subject, with roles arg0 and arg1.
- **please** is the object, with roles arg0 and arg1.

Diagram of semantic roles and senses for the sentence:

Peter is eager-41 to please-01.

- **eager-41** is the verb.
- **Peter** is the subject, with role arg0.
- **please-01** is the object, with role arg0.
Tecto-to-AMR: 4. Add Named Entities
PML-TQ rules

- Based on AMR guidelines (generalized)
- For copula, attributes, non-core roles ...
- PML-TQ is for querying, not for transformation

A PML-TQ rule

LHS (PML-TQ Query)
- t-node $b_2$
  - functor = "ACT"
  - formeme = "n::*"
- t-node $b_{DEL}$
  - t_lemma in {"be", "become", "remain"}

RHS (AMR Subtree)
- ARG0
- ARG1
- b2
- w
- r

Guidelines example:
The boy is responsible for the work.
Ondrej was nervous about the presentation.
<table>
<thead>
<tr>
<th></th>
<th>Semantic Role Mapping</th>
<th>Named Entities</th>
<th>Verbalization Lists</th>
<th>Smatch</th>
<th>Smatch w/o senses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline (direct conversion)</td>
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</tr>
<tr>
<td>Tsurgeon (rule-based)</td>
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<td>44</td>
<td>52</td>
</tr>
<tr>
<td>JAMR (text-to-AMR parser)</td>
<td></td>
<td></td>
<td></td>
<td>44</td>
<td>45</td>
</tr>
</tbody>
</table>
You may say I’m a dreamer, but I’m not the only one.