MT as Cross-Lingual Parsing
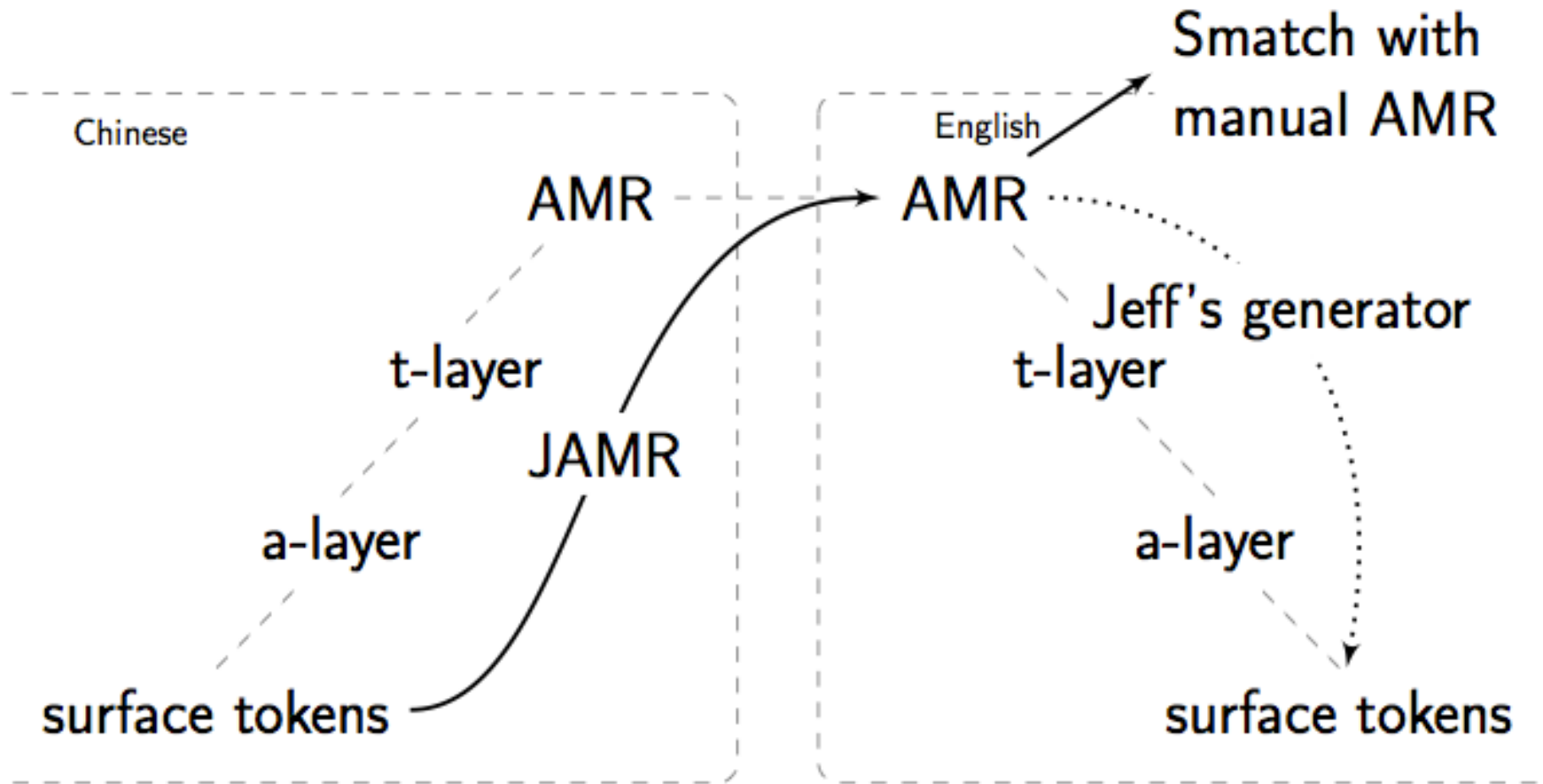
Overview of Cross-Lingual Parsing

Training JAMR

The tour was a surprise offer made by North Korea in November 2001.

```
(t / thing
    :ARG0-of (s / surprise-01)
    :ARG1-of (o / offer-01
        :ARG0 (c / country
            :name (n / name
                :op1 "North"
                :op2 "Korea"))
        :time (d / date-entity
                :month 11
                :year 2001))
    :domain (t2 / tour-01))
```

Need Alignments for Training JAMR

The tour was a surprise offer made by North Korea in November 2001.

```
(t / thing
    :ARG0-of (s / surprise-01)
    :ARG1-of (o / offer-01
        :ARG0 (c / country
            :name (n / name
                :op1 "North"
                :op2 "Korea"))
        :time (d / date-entity
            :month 11
            :year 2001))
    :domain (t2 / tour-01))
```
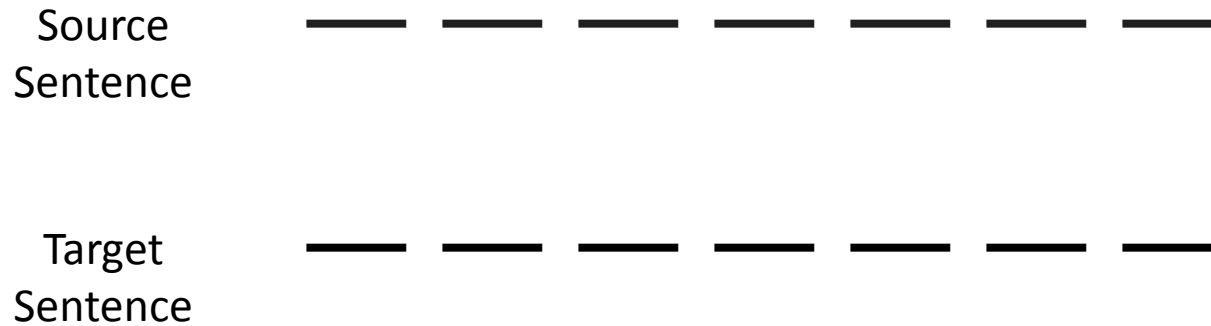
Mono-lingual parsing

- JAMR's aligner uses:
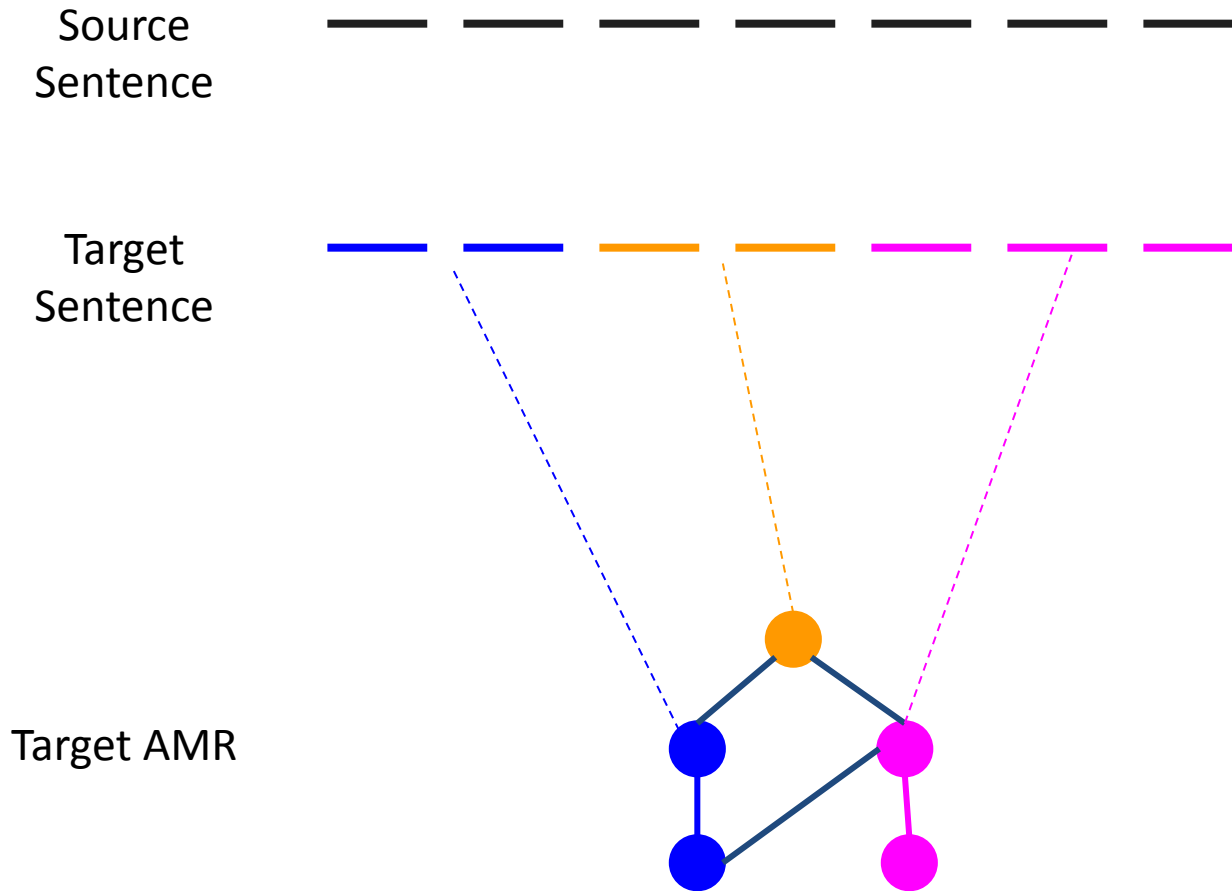 - Edit distance based rules
  - WordNet similarity

Cross-lingual parsing

- For cross-lingual parsing we need
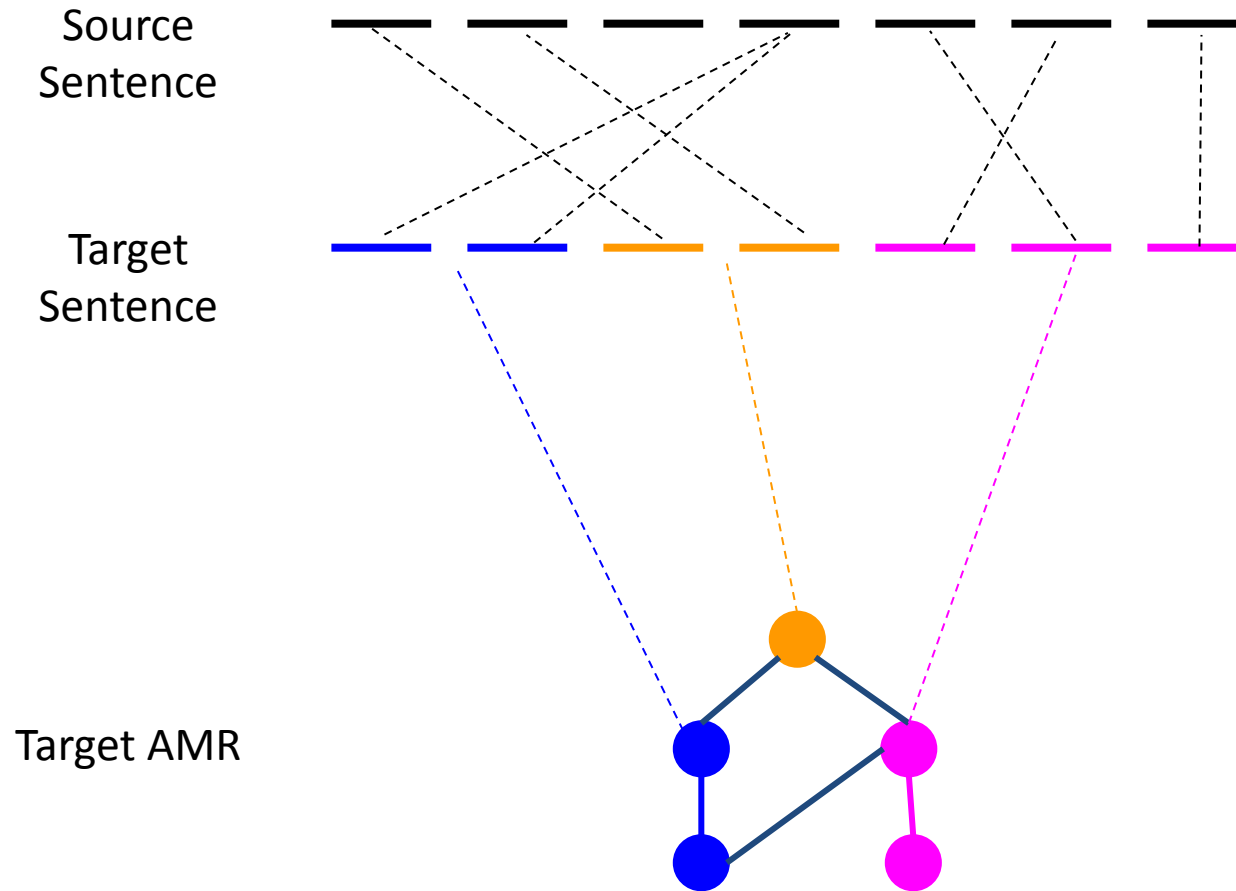 - alignments from a source language string to target AMR concepts
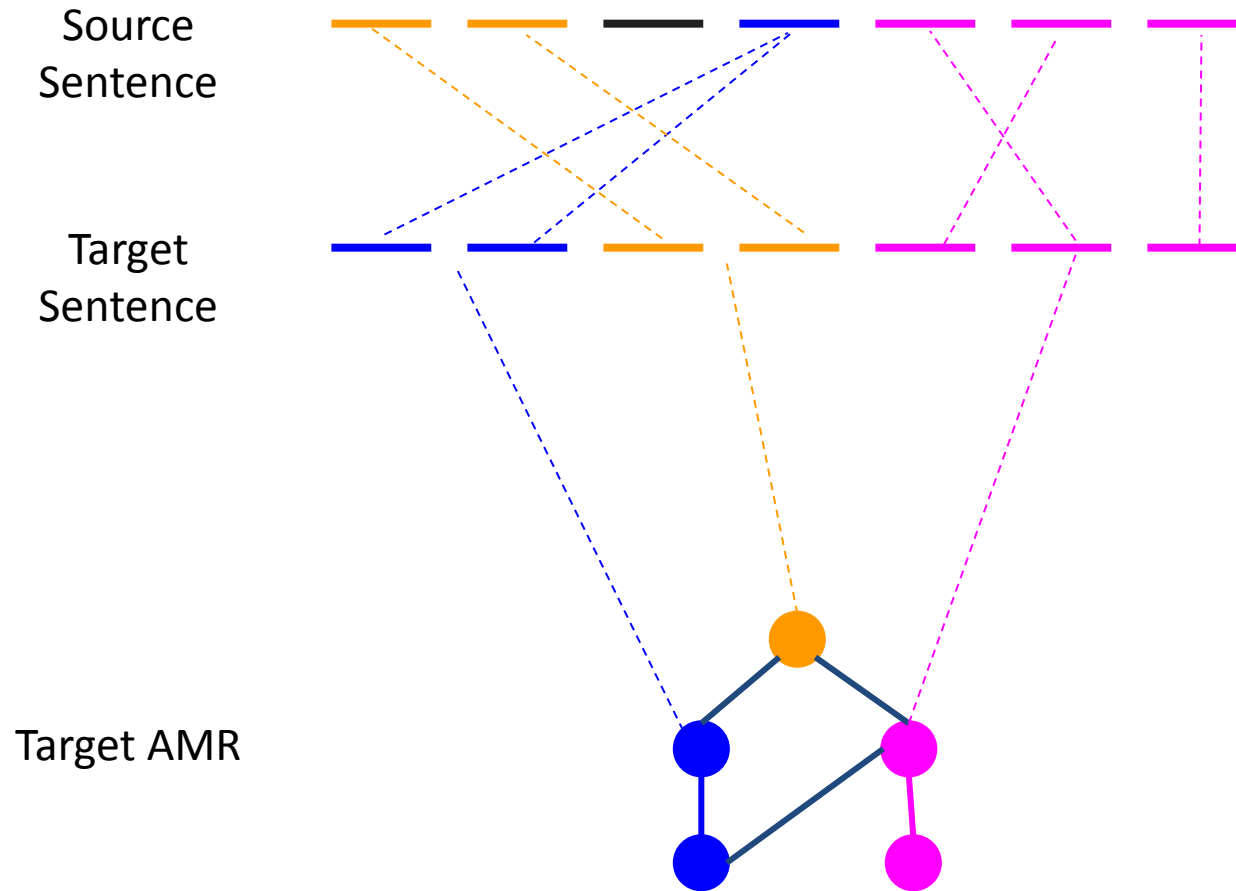
Raw Parallel Corpus

Source
Sentence

— — — — — — — —

Target
Sentence

— — — — — — — —

Run Target-Side JAMR

Source
Sentence

Target
Sentence

Target AMR

Word Align Source-Target

Source Sentence

Target Sentence

Target AMR

Project to AMR

Source
Sentence

Target
Sentence

Target AMR

Training Data for cross-lingual Parser

Source Sentence
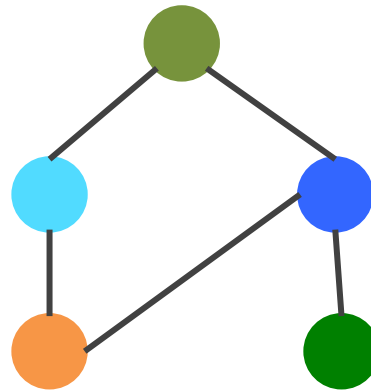
Target AMR
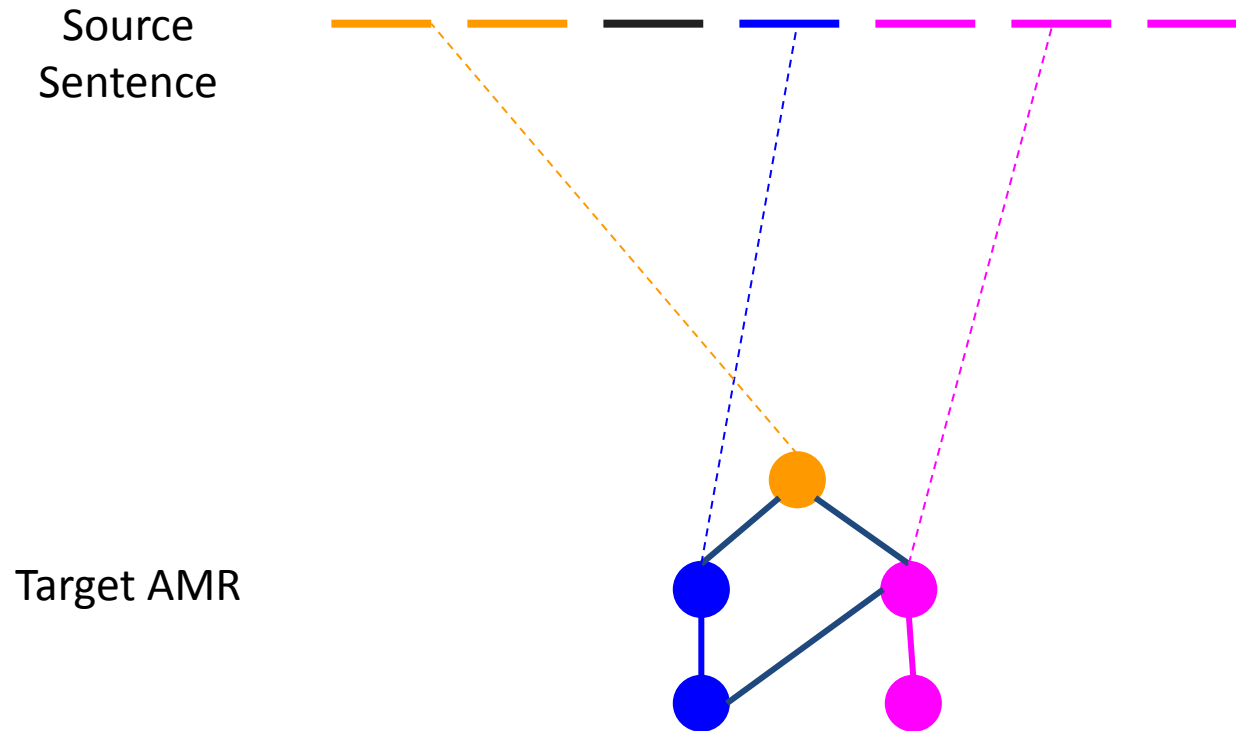
Experiment 2: Word Align to AMR Concepts

Source Sentence   —— —— —— —— —— ——

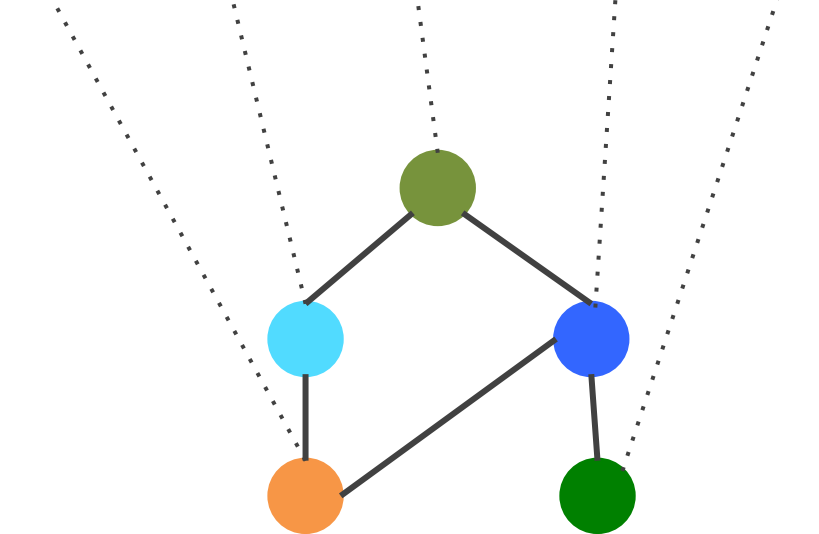EN-AMR Graph

Serialize Concepts

Source Sentence

EN-AMR
Concepts
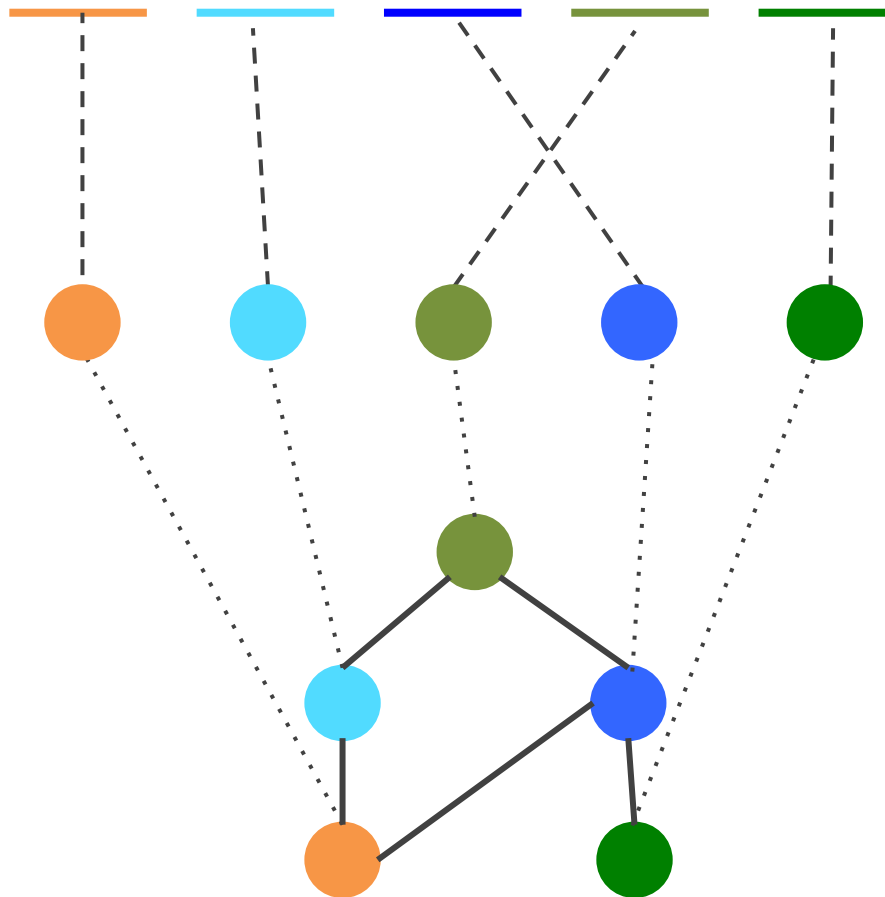
EN-AMR Graph

Align to AMR Concepts

Source Sentence

EN-AMR Concepts

EN-AMR Graph

Data Used

- FBIS 300k Chinese-English parallel corpus

- More Details
  - Concept Table Extraction: 290k
  - Concept Id Weights: 10k (stage 1)
  - Relation Id Weights: 100 (stage 2)

他 最后 祝愿 李鹏 委员长 访问 各 国 取得 圆满 成功 。

Lastly he wished chairman li peng every success in his visit to the other countries .

Gold AMR

```
(w / wish-01
  :ARG0 (h / he)
  :ARG1 (s / succeed-01
    :ARG0 (p / person
      :name (n2 / name          :op1 "Li"
              :op2 "Peng")
      :ARG0-of (h2 / have-org-role-91
        :ARG2 (c / chairman)))
    :ARG1 (v / visit-01
      :ARG0 p
      :ARG1 (c2 / country
        :mod (o / other)))))
```

Output AMR

```
(c2 / chairman
  :ARG1 (v / visit-01
    :ARG1-of (s / succeed-01)
    :ARG3 (c / country
      :mod (o / other))
    :prep-as (e / every))
  :ARG1-of (w / wish-01
    :ARG0 (p / person
      :name (n / name
        :op "peng"
        :op "li"))))
```

- Concepts from English side JAMR
- Relations from Cross-lingual JAMR

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    :name (n2 / name       :op1 "Li"
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   :ARG0-of (h2 / have-org-role-91
    :ARG2 (c / chairman)))
  :ARG1 (v / visit-01
   :ARG0 p
   :ARG1 (c2 / country
    :mod (o / other)))))
```

Output AMR

```
(s2 / say-01
  :ARG0-of (w / wish-01
   :ARG1 (a / achieve-01
    :ARG0 (c / country
     :location (a2 / all))
    :ARG1 (s / succeed-01
     :ARG1 (t / this))))
  :ARG1 (l / last))
```

- Concepts & Relations from Cross-lingual JAMR

Future Work

- Train stages with more data

- Error analysis

- Phrase alignment rather than heuristics over word alignment

- More language pairs