Efficient AMR Parsing with CLAP

Compact Linearization with an Adaptable Parser

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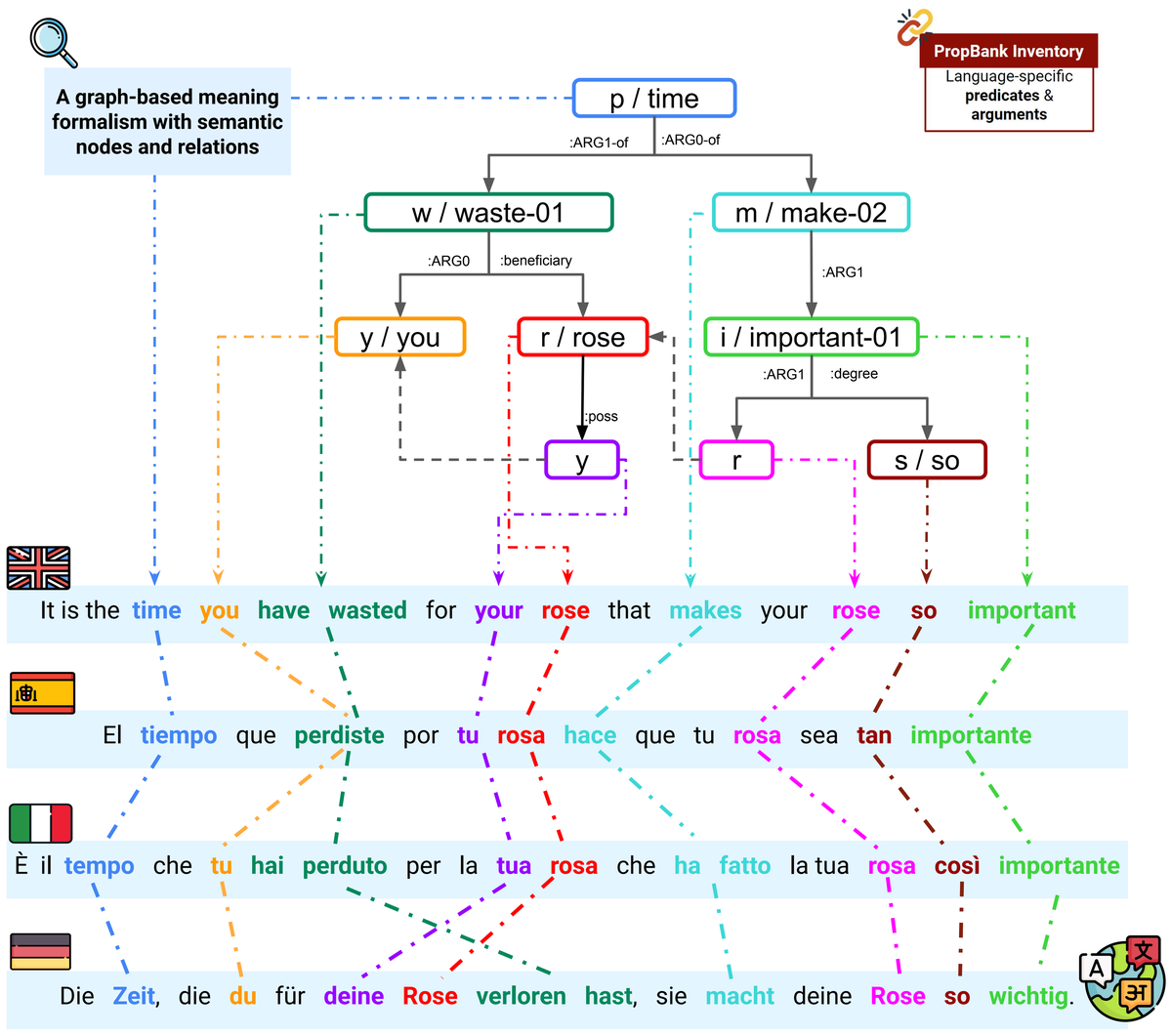
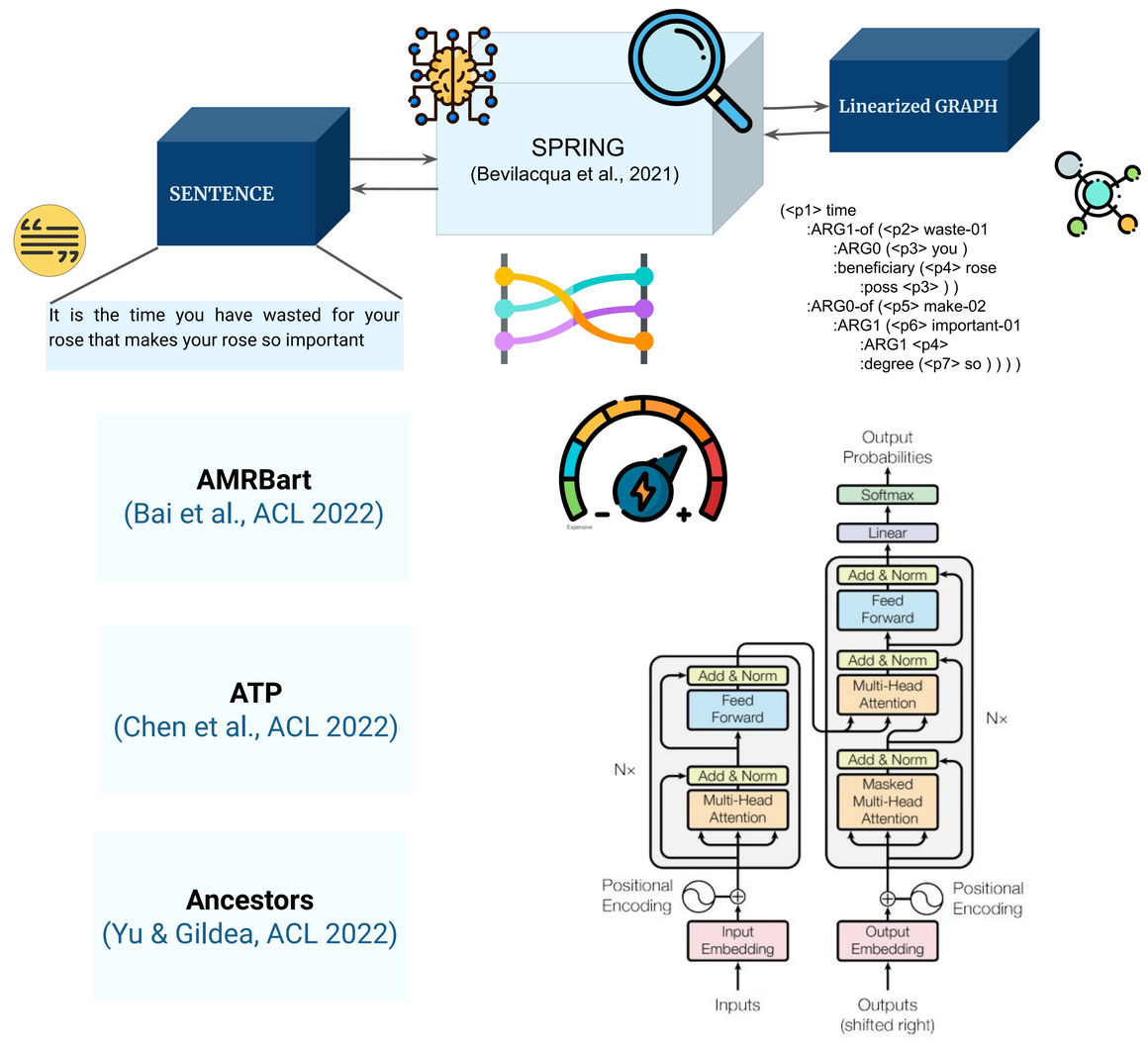
@babelscape

Abstract Meaning Representation



Autoregressive Parsing



From DFS Linearization to CLAP: Compact Linearization

In 1981, Pablo Picasso moved from his hometown – **Malaga** – to A Coruña

```
( <p:0> move-01
  :ARG0 ( <p:1> person
    :name ( <p:2> name
      :op1 <l> Pablo <\l>
      :op2 <l> Picasso <\l> ) )
  :ARG1 ( <p:3> hometown
    :poss <p:1>
    :ARG0-of (<p:4> have-location-91
      :ARG1 ( <p:5> city
        :name (<p:6> name
        :op1 <l> Malaga <\l> ) ) ) )
  :ARG2 ( <p:7> city
    :name ( <p:8> name
      :op1 <l> A <\l>
      :op2 <l> Coruña <\l> ) )
  :time ( <p:9> date-entity
    :year 1891 ) )
```

Reducing Structures

```
( <p:0> move-01
  :ARG0 ( <p:1> person
    :name Pablo_Picasso )
  :ARG1 ( <p:3> hometown
    :poss <p:1>
    :ARG0-of (<p:4>
have-location-91
      :ARG1 ( <p:5> city
        :name Malaga ) ) )
  :ARG2 ( <p:7> city
    :name A Coruña )
  :time ( <p:9> date-entity
    :year 1891 ) )
```

Removing Identifiers

```
( move-01
  :ARG0 ( person
    :name Pablo_Picasso )
  :ARG1 ( hometown
    :poss person
    :ARG0-of ( have-location-91
      :ARG1 ( city
        :name Malaga ) ) )
  :ARG2 ( city#2
    :name A Coruña )
  :time ( date-entity
    :year 1891 ) )
```

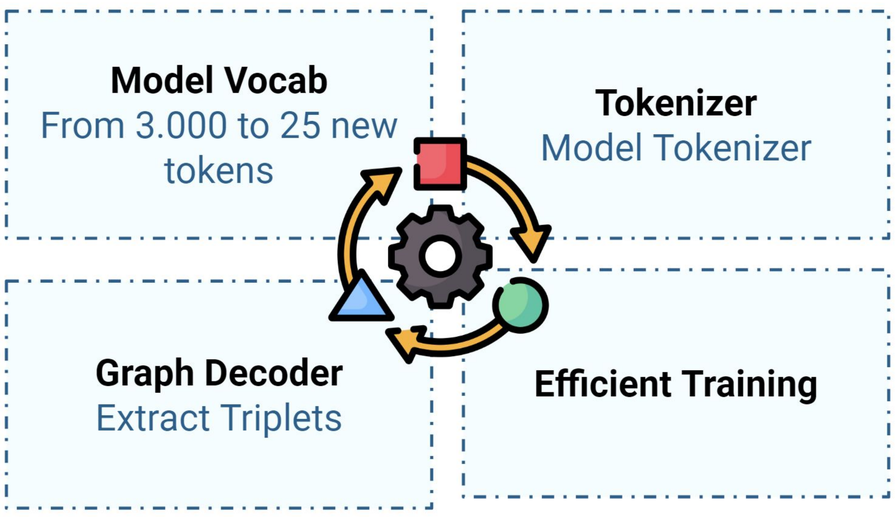
Reducing Parentheses

```
move-01
  :ARG0 person
    :name Pablo_Picasso )
  :ARG1 hometown
    :poss person
    :ARG0-of have-location-91
      :ARG1 city
        :name Malaga )2
  :ARG2 city#2
    :name A Coruña )
  :time ( date-entity
    :year 1891 )
```

Recategorization

```
move-01
  :ARG0 person
    :name Pablo_Picasso )
  :ARG1 hometown
    :poss person
    :location city
        :name Malaga )2
  :ARG2 city#2
    :name A Coruña )
  :time ( date-entity
    :year 1891 )
```

CLAP: Adaptable Parser



Results

Linearization: Compact vs DFS
45-55%

This reduction decrease in:
- 50% the training time
- 65% the inference time

System (DFS): CLAP vs SPRING
66%
Reduction in the number Batches

This reduction decrease in:
- 65% the training time
- 50% the inference time

Total Time Reduction: CLAP with Compact Vs SPRING with DFS
80%

- 82% the training time
- 78% the inference time

Sapienza NLP
http://nlp.uniroma1.it

KnowGraphs
No. 860801
https://knowgraphs.eu/

AMR Alignment
https://github.com/Babelscape/AMR-alignment