Alexandria, October 7-11

X UNL School

Day #4

UNLization

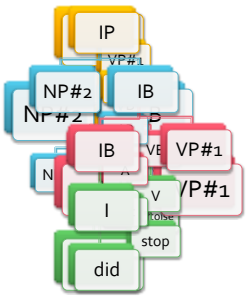
UNLization Steps

Parsing

Parsing

Building a grammar (I)

extracting the rules from the trees



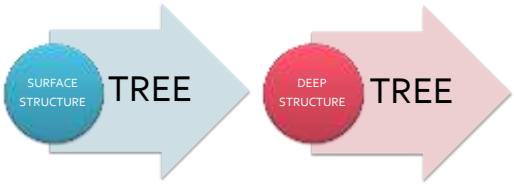
(NP):=(NP)("and")(NP);
(NP):=(DP)(NB);
(NB):=(N);
(DP):=(DB);
(DB):=(D);
(IP):=(NP)(IB);
(IB):=(VP);
(VP):=(VB);
(VB):=(V);
(IB):=(IB)(VP);
(IB):=(I);
(VB):=(AP)(VB);
(AP):=(AB);
(AB):=(A);

How is it done?

- Create a corpus
- Analyze the corpus (provide a tree)
- Extract the relations from the corpus
- Invert rules
- Order rules
- Put rules in the grammar format

Transformation

Transformation



Why is this necessary?

- To restore the dependency relations between constituents that are isolated in the surface structure
  - SUBJECT: from the specifier of IP to the specifier of VP
  - ADJUNCTS: from the specifier of CP to the adjunct of VP
  - COORDINATION: filling in the missing branches

How is it done?

- Movement
  - Subject (from IP to VP)

```
IP( IB (;VP(;e   )); %s,^e):=
IP( IB (;VP(;%s)); %e,+e);
```

  - Adjunct (de-topicalization)
    - There is an available position

```
CP(CB(;IP(IB(;VP(VB(;  e);));));%a,^e):=
CP(CB(;IP(IB(;VP(VB(;%a);)));));%e,+e);
```

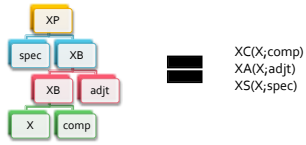
    - There is no available position

```
CP(CB(;IP(IB(;VP(VB(;  ^e),%vb;));));%a,^e ):=
CP(CB(;IP(IB(;VP(VB(VB(%vb;%a))))));));%e,+e);
```

Dearborisation

Dearborisation

- Conversion of tree structures into head-driven structures



- XB(XB(%x;%y);%z):=XB(%x;%y)XB(%x;%z);
- XP(XB(%x;%y);%z):=XB(%x;%y)XS(%x;%z);

Steps

- Generalisation
  - /[ACDIJNPV]B/(%x;%y):=XB(%x;%y);
  - /[ACDIJNPV]P/(%x;%y):=XP(%x;%y);
- Feature propagation
  - (XB(%x;%y),%w,att):=(XB(%x,+att=%w;%y),%w,-att);
  - (XP(%x;%y),%w,att):=(XP(%x,+att=%w;%y),%w,-att);
- Dearborisation
  - XP(XB(%x;%y);%z):=XB(%x;%y)XS(%x;%z);
  - XB(XB(%x;%y);%z):=XB(%x;%y)XB(%x;%z);
  - XS(XB(%x;%y);%z):=XB(%x;%y)XS(%x;%z);
  - XS(%x;XB(%y;%z)):=XS(%x;%y)XB(%y;%z);
  - XB(%z;XB(%x;%y)):=XB(%x;%y)XB(%z;%x);
  - XP(%x;%y):=XS(%x;%y);
- Deletion of empty categories
  - (e):=;
- Recategorization
  - (XB(%x;%y,adjt),N,%z):=(NA(%x;%y),%z);
  - (XB(%x;%y,comp),N,%z):=(NC(%x;%y),%z);
  - (XS(%x;%y,spec),N,%z):=(NS(%x;%y),%z);
  - ...

Interpretation

Interpretation

- Project head-driven relations into UNL:
  - Attributes
  - Relations

The Hare and the Tortoise

- After dearborisation
  - and(:06, :08)
  - NS:06(tortoise:09, "the":07.@def)
  - NS:08(hare:03, "the":01.@def)
- Interpretation:
  - NS(%n;D,att,%d):=(%n,att=%d);

The Tortoise replied

- After dearborisation
  - NS(tortoise:03, "the":01.@def)
  - VS(reply:05, tortoise:03)
- Interpretation
  - NS(%n;D,att,%d):=(%n,att=%d);
  - VS(%v;N,%n):=agt(%v;%n);

The Tortoise did not stop

- After normalisation
  - NS(tortoise:03, "the":01.@def)
  - VS(stop:09, tortoise:03)
  - IA("did":05.@past, stop:09)
  - VA(stop:09, "not":07.@not)
  - NS("not":07.@not, -:0E)
- Interpretation
  - NS(%n;D,att,%d):=(%n,att=%d);
  - VS(%v;N,%n):=agt(%v;%n);
  - IA(%i,att;V,%v):=(%v,att=%i);
  - VA(%v;A,%a,att):=(%v,att=%a);

Exercise #1

- Upload the Default Grammar (available at the Wiki) to UNLWEB>UNLDEV>IAN>T-Rules
- Upload the English Grammar (available at the Wiki) to UNLWEB>UNLDEV>IAN>T-Rules
- Provide the semantic interpretation rules necessary to generate the following sentences:
  - The Hare and the Tortoise
  - The Tortoise replied
  - The Tortoise did not stop
  - The Tortoise had already won the race