

Alexandria, October 7-11

X UNL School

Day #1



Guide

- Welcome
- Context
 - The UNL
 - The UNDL Foundation roadmap
 - The UNLiversity
 - The workshop
 - FoR-UNL
- Workshop

Welcome

Participants

- Alshaimaa Ahmed Gaber
- Athanasios Karasimos
- Grega Milharcic
- Israa El-Sayed El-Hosiny
- Martin Luts
- Marwa Saber Arafat
- Milica Denic
- Nahla Mohamed Mahmoud
- Ofelia Hovhannisyan
- Olga Vartzioti
- Omneya Hosni Zayyan
- Parameswarappa S
- Parteek Kumar
- Rehab Arafat Rashwan



Context



The Universal Networking Language
(UNL)

UNL

translation
knowledge representation

Universal
Networking
Language



UNITED NATIONS
UNIVERSITY

1996



Commitments

1. The UNL must represent knowledge
2. The UNL must be a language for computers
3. The UNL must be self-sufficient
4. The UNL must be general-purpose
5. The UNL must be independent from any particular natural language

Assumptions

- Languages convey information
- Information can be represented by semantic networks
- Any information may be expressed in any language

Properties

- Non-Ambiguity
- Non-Redundancy
- Compositionality
- Declarativeness
- Completeness

Structure (I)

Informa
language
represent
independ



natural
an be
language-
structure.

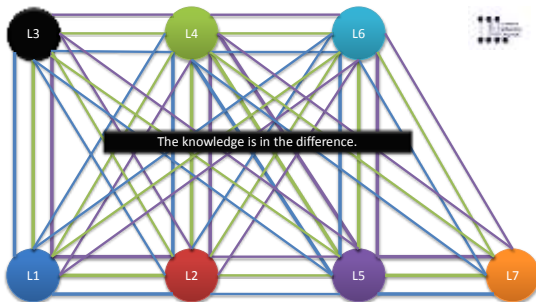
Structure (II)

Relations between languages can be expressed in three layers:

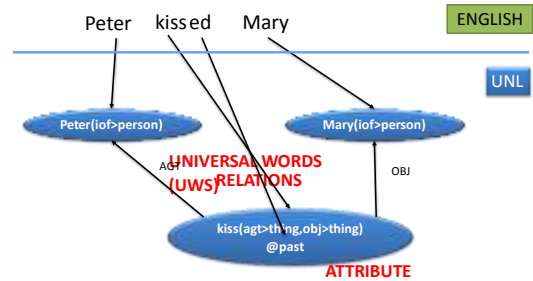
CONCEPTS	= Universal Words (UWs)
CONCEPT MODIFIERS	= Attributes
RELATIONS BETWEEN CONCEPTS	= Relations



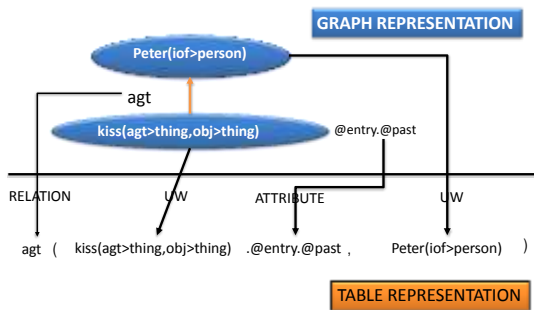
The Universal NETWORKING Language



Natural Language-to-UNL (UNL-ization)



Syntax of UNL



UNL document

```
[D]
[S:01]
(org:en)
Peter kissed Mary.
(/org)
(unl)
agt(kiss(agt>thing,obj>thing).@entry.@past, Peter(iof>person))
obj(kiss(agt>thing,obj>thing).@entry.@past, Mary(iof>person))
(/unl)
[/S]
[/D]
```

UNL (<http://anydomain/anydocument.unl>)

```
<unl>
agt(kiss(agt>thing,obj>thing).@entry.@past, Peter(iof>person))
obj(kiss(agt>thing,obj>thing).@entry.@past, Mary(iof>person))
</unl>
```



Peter kissed Mary.

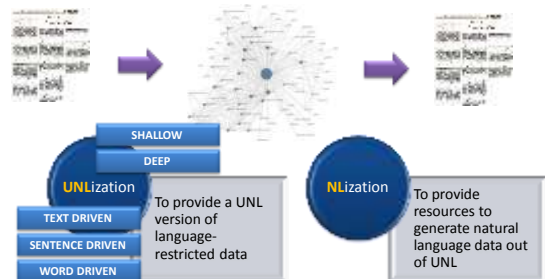


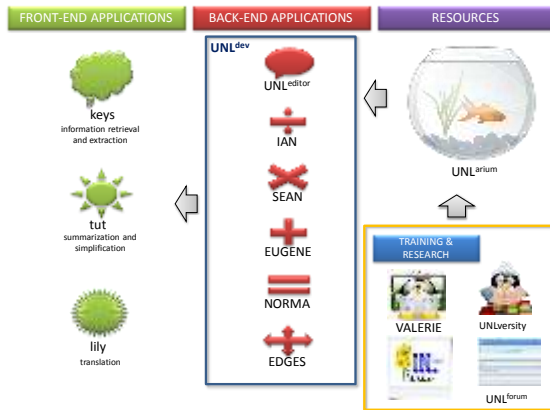
Pierre a embrassé Marie.



Pedro besó a María.

The UNL System





UNLiversity

- ☐ Internship Program
- ☐ UNL Panel
 - ☐ 1 UNL Panel (Mumbai, COLING 2012)
- ☐ UNL Grammar Workshop (A1, A2, B1, B2, C1, C2)
 - ☐ A1
 - ☐ European Chapter (Geneva, February 2012)
 - ☐ Indian Chapter (Mumbai, June 2012)
 - ☐ Asian Chapter (Macau, January 2013)
 - ☐ Middle East Chapter (Kuwait, March 2013)
 - ☐ African Chapter (Johannesburg, June 2013)
 - ☐ American Chapter (Brasilia, October 2013)
 - ☐ A2
 - ☐ Alexandria (October, 2012)
 - ☐ Geneva (May, 2013)



UNLiversity

FoR-UNL

LEVEL	UNL-NL DIC	NL-UNL DIC	UNL-NL Grammar	NL-UNL Grammar
A1	MIR-A1	BRUNO-A1	UC-A1	NC-A1
A2	MIR-A2	BRUNO-A2	UC-A2	NC-A2
B1	MIR-B1	BRUNO-B1	UC-B1	NC-B1
B2	MIR-B2	BRUNO-B2	UC-B2	NC-B2
C1	MIR-C1	BRUNO-C1	UC-C1	NC-C1
C2	MIR-C2	BRUNO-C2	UC-C2	NC-C2

Workshop

Goals

- To build the basic modules of a NL-UNL (analysis) grammar for the corpus UC-A2
- To build the basic modules of a UNL-UNL (generation) grammar for the corpus UC-A2



Schedule

October 7th, 2012 - Sunday
Introduction
Sentences 1, 3, 8, 12
October 8th, 2012 - Monday
Sentences 13, 7, 2
October 9th, 2012 - Tuesday
Sentences 10, 9, 6
October 10th, 2012 - Wednesday
Sentences 4, 5, 11
October 11th, 2012 - Thursday
Evaluation & Discussion



Structure

- 09:00 – 11:00
 - Presentation of the English Analysis
 - Presentation of the English Generation
 - Discussion of problems & issues
- 11:00 – 11:30 – Coffee-break
- 11:30 – 13:00 – Analysis
- 13:00 – 14:30 – Lunch
- 14:30 – 16:00 – Generation
- 16:00 – 16:30 – Coffee-break
- 16:30 – 17:30 – Problems, issues and evaluation

Deliverables

During the workshop

- Text 1:
 - Sentences
 - UNL-NL dictionary (corresponding to the corpus)
 - NL dictionary (corresponding to the corpus)
 - UNL-NL grammar (corresponding to the corpus)
 - NL-UNL grammar (corresponding to the corpus)
- Before January 15th
- Text 2
 - Text 3
 - Text 4
 - Text 5



Corpus

Text 1

1. The Hare and the Tortoise
2. The Hare one day ridiculed the short feet and slow pace of the Tortoise.
3. The Tortoise replied:
4. "Though you be swift as the wind, I will beat you in a race."
5. The Hare believed her assertion to be simply impossible and assented to the proposal.
6. They agreed that the Fox should choose the course and fix the goal.
7. On the day appointed for the race the two started together.
8. The Tortoise did not stop.
9. She went on with a slow but steady pace straight to the end of the course.
10. The Hare laid down by the wayside and took a nap under a tree.
11. At last, he woke up and ran as fast as he could, but it was too late.
12. The Tortoise had already won the race.
13. Slow but steady progress wins the race.

Day #1

1. The Hare and the Tortoise
3. The Tortoise replied:
8. The Tortoise did not stop.
12. The Tortoise had already won the race.

Sentence #1

```
[S:1]
{org:en}
The Hare and the Tortoise
{/org}
{unl}
and(tortoise.@anthropomorphism.@def,hare.@anthropomorphism.@def)
{/unl}
[/S]
```

Sentence #3

```
[S:3]
{org:en}
The Tortoise replied:
{/org}
{unl}
agt(reply.@past,tortoise.@anthropomorphism.@def)
{/unl}
[/S]
```

Sentence #8

```
[S:8]
{org:en}
The Tortoise did not stop.
{/org}
{unl}
agt(stop.@past.@not,tortoise.@anthropomorphism.@def)
{/unl}
[/S]
```

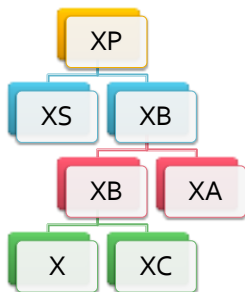
Sentence #12

```
[S:12]
{org:en}
The Tortoise had already won the race.
{/org}
{unl}
exp(win.@past.@perfective,tortoise.@anthropomorphism.@def)
obj(win.@past.@perfective,race.@def)
tim(win.@past.@perfective,already)
{/unl}
[/S]
```

Theory

X-bar theory

X-bar structure

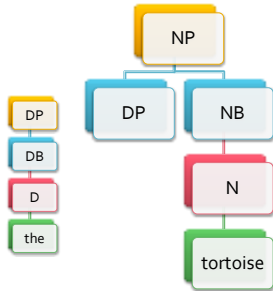


- Where:
 - XP = maximal projection
 - XB = intermediate projections
 - XS = specifier
 - XA = adjunct
 - XC = complement
 - X = head
 - N (noun)
 - V (verb)
 - J (adjective)
 - A (adverb)
 - D (determiner)
 - P (preposition)
 - C (conjunction)

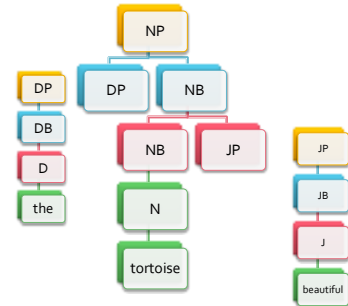
Tortoise



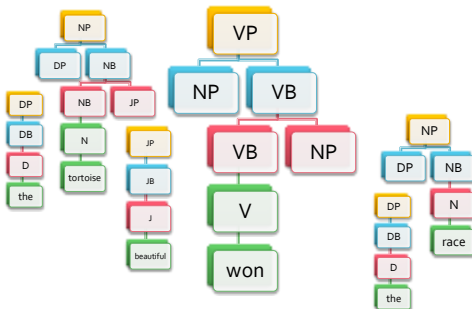
The tortoise



The beautiful tortoise



The beautiful tortoise won the race



General Grammar

ANALYSIS

- $(X, ^X B) := (+XB)$;
- $(XB)(XC) := (XB(XB;XC, +comp), +X)$;
- $(XB)(XA) := (XB(X;XA, +adjt), +X)$;
- $(XS)(XB) := (XP(XB;XS, +spec), +X)$;
- $XB(XB(A;B);C) := XB(A;B)XB(A;C)$;
- $XP(XB(A;B);C) := XS(A;C)XB(A;B)$;

GENERATION

- $XB(A;B) := (A)(\text{" "}, +BLK)(B)$;

English

Sentence #1 (ANALYSIS)

ANALYSIS

- INITIAL STATE:
 - The Hare and the Tortoise
- FINAL STATE
 - and(tortoise.@def,hare.@def)
- RULES
 - Remove blank
 - (BLK):=;
 - the X > X.@def:
 - (D,att,%x)(N,%y):=(%y,att=%x);
 - X and Y > and(y,x)
 - (NP,%x)((and))(NP,%y):=(and(%y;%x),+N,+XP=NP);

Sentence #1 (GENERATION)

- GENERATION
 - INITIAL STATE:
 - and(tortoise.@def,hare.@def)
 - FINAL STATE
 - The Hare and the Tortoise
 - RULES
 - and(x,y) > y and x
 - and(%x,%y):=XA(%y,BEF,CC([and];%x));
 - x.@def > the x
 - (%x,N,@def):=NS(%x,-@def,%y,[the],LEX=D,POS=ART);

Sentence #3 (ANALYSIS)

- ANALYSIS
 - INITIAL STATE:
 - The Tortoise replied.
 - FINAL STATE
 - agt(reply.@past,tortoise.@def)
 - RULES
 - Remove blank
 - (BLK):=;
 - the X > X.@def:
 - (%x,N,@def):=NS(%x,-@def,%y,[the],LEX=D,POS=ART);
 - X > X.@past
 - (V,PAS,^(%x,%x):=(%x,+@past);
 - XY > agt(Y,X)

Sentence #3 (GENERATION)

- GENERATION
 - INITIAL STATE:
 - agt(reply.@past,tortoise.@def)
 - FINAL STATE
 - The Tortoise replied
 - RULES
 - agt(x,y) > y x
 - agt(V,%x,N,%y):=VS(%x,%y);
 - VS(%x,%y):=VP(%x,%y);
 - VP(%x,%y):=(%y)(" ",+BLK)(%x);
 - x.@def > the x
 - (%x,N,@def):=NS(%x,-@def,%y,[the],LEX=D,POS=ART);
 - x.@past
 - (V,%x,@past):=(%x,-@past,+TNS=PAS);

Sentence #8 (ANALYSIS)

- ANALYSIS
 - INITIAL STATE:
 - The Tortoise did not stop.
 - FINAL STATE
 - agt(stop.@past,@not,tortoise.@def)
 - RULES
 - Remove blank
 - (BLK):=;
 - the X > X.@def:
 - (D,att,%x)(N,%y):=(%y,att=%x);
 - Did not X > X.@past.@not
 - ("did")("not")(V,%x):=(%x,+@past,+@not);
 - XY > agt(Y,X)

Sentence #8 (GENERATION)

- GENERATION
 - INITIAL STATE:
 - agt(stop.@past,@not,tortoise.@def)
 - FINAL STATE
 - The Tortoise did not stop
 - RULES
 - agt(x,y) > y x
 - agt(V,%x,N,%y):=VS(%x,%y);
 - VS(%x,%y):=VP(%x,%y);
 - VP(%x,%y):=(%y)(" ",+BLK)(%x);
 - x.@def > the x
 - (%x,N,@def):=NS(%x,-@def,%y,[the],LEX=D,POS=ART);
 - x.@past.@not

Sentence #12 (ANALYSIS)

- ANALYSIS
 - INITIAL STATE:
 - The Tortoise had already won the race.
 - FINAL STATE
 - enqwin.@past.@perfective,tortoise.@anthropomorphism.@def
 - obj(win.@past.@perfective,race.@def)
 - tim(win.@past.@perfective,already)
 - RULES
 - Remove blank
 - (BLK):=;
 - the X > X.@def:
 - (D,att,%x)(N,%y):=(%y,att=%x);
 - had + X > X.@past.@perfective
 - ("had")(V,PTP%x):=(%x,+@past,+@perfective)
 - A V > tim(V,A)
 - XY > agt(Y,X)
 - XY > obj(X,Y)
 - (V,%x)(N,%y):=(VC(%x,%y));

Sentence #12 (GENERATION)

■ GENERATION

■ INITIAL STATE:

- `expl(win.@past.@perfective,tortoise.@anthropomorphism.@def)`
- `obj(win.@past.@perfective,race.@def)`
- `tim(win.@past.@perfective,already)`

■ FINAL STATE

- The Tortoise had already won the race

■ RULES

Practice

Methodology

■ ANALYSIS

- Upload the translated versions of the sentences to UNLWEB>UNLDEV>IAN>NL Files
- Upload the analysis dictionary to UNLWEB>UNLDEV>IAN>Dictionary
- Create the NL-UNL Grammar
 - T-Grammar
 - D-Grammar

■ GENERATION

- Upload the UNL version of the corpus to UNLWEB>UNLDEV>EUGENE>UNL Document
- Upload the generation dictionary to UNLWEB>UNLDEV>EUGENE>Dictionary
- Create the UNL-NL Grammar
 - T-Grammar
 - D-Grammar