

Time event discovery from discourse representation structures and schedule ontology instantiation



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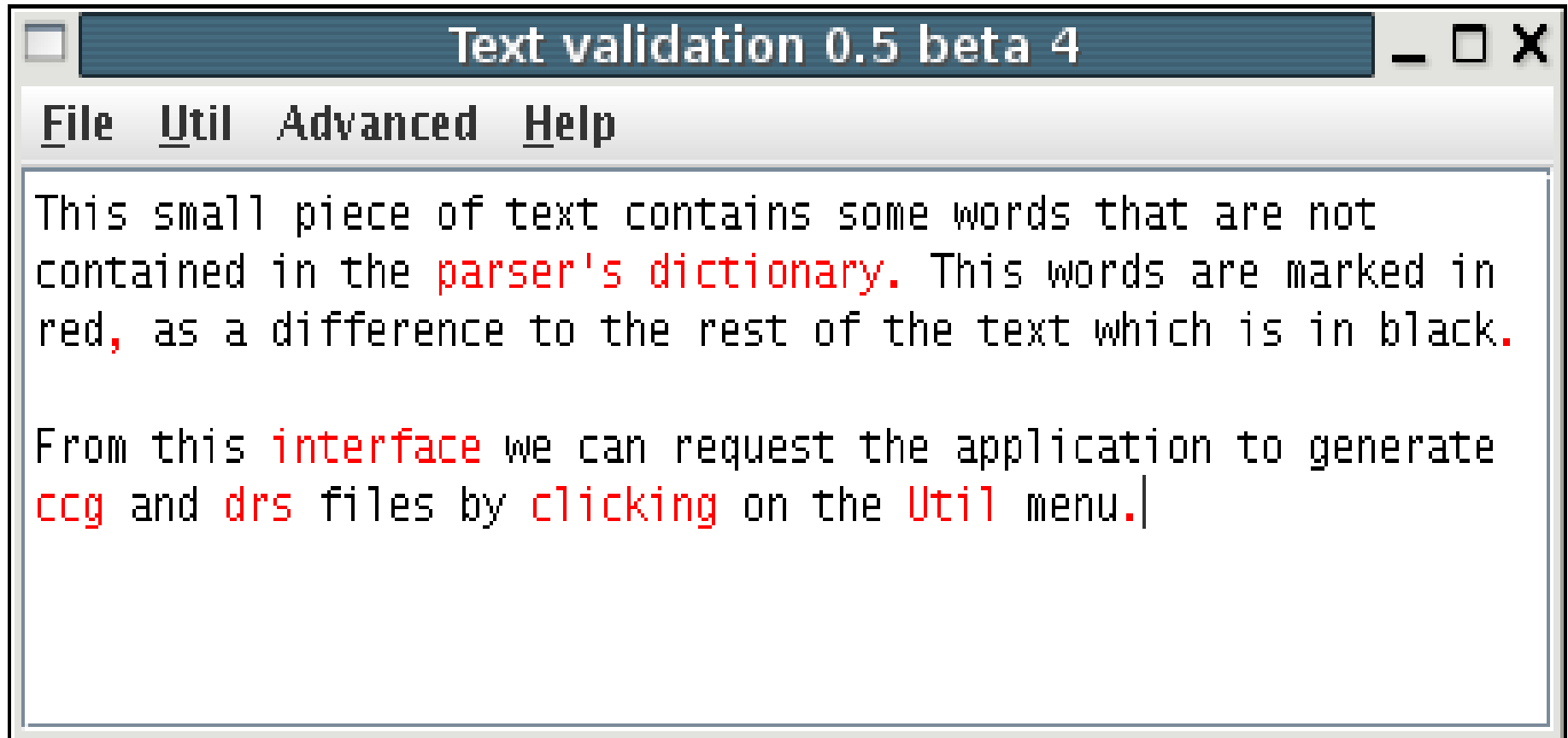
Agenda

- ✓ Introduction
- ✓ Working environment
- ✓ Discourse Representation Structures
- ✓ Object Oriented DRS
- ✓ Schedule Discovery in DRS
- ✓ Heuristics for argument discrimination
- ✓ Time event structure
- ✓ Towards Ontology instantiation
- ✓ Results
- ✓ Conclusion

Introduction

- ✓ Ambient Intelligence Aml
- ✓ Schedule Discovery
- ✓ Discourse Representation Theory
- ✓ DRT Implementations

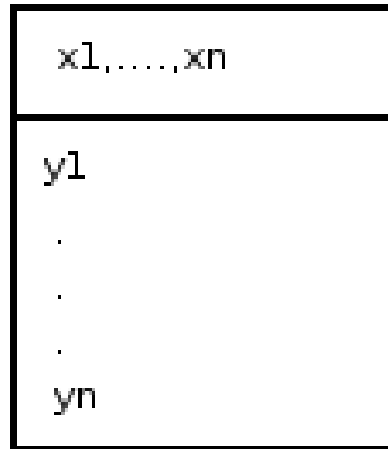
Working environment



Discourse Representation Structures

A formal definition of what a DRS is:

1.- if x_1, \dots, x_n are discourse referents ($n \geq 0$) and y_1, \dots, y_n are conditions then:



is a DRS.

2.- If R is a relation symbol of arity n , and t_1, \dots, t_n are terms, then $R(t_1, \dots, t_n)$ is a condition.

3.- If t_1 and t_2 are terms then $t_1 = t_2$ is a condition.

4.- If B is a DRS, then $\neg B$ is a condition.

5.- If B_1 and B_2 are DRSs, then $B_1 \vee B_2$ is a condition.

6.- If B_1 and B_2 are DRSs, then $B_1 \rightarrow B_2$ is a condition.

7.- Nothing else is a DRS or a condition.

Example

x5 x6 x1 x2

person(x5)
named(x6, sunday, nam)
have(x1)
agent(x1, x5)
theme(x1, x2)
proposition(x2)

x2:

x4 x3

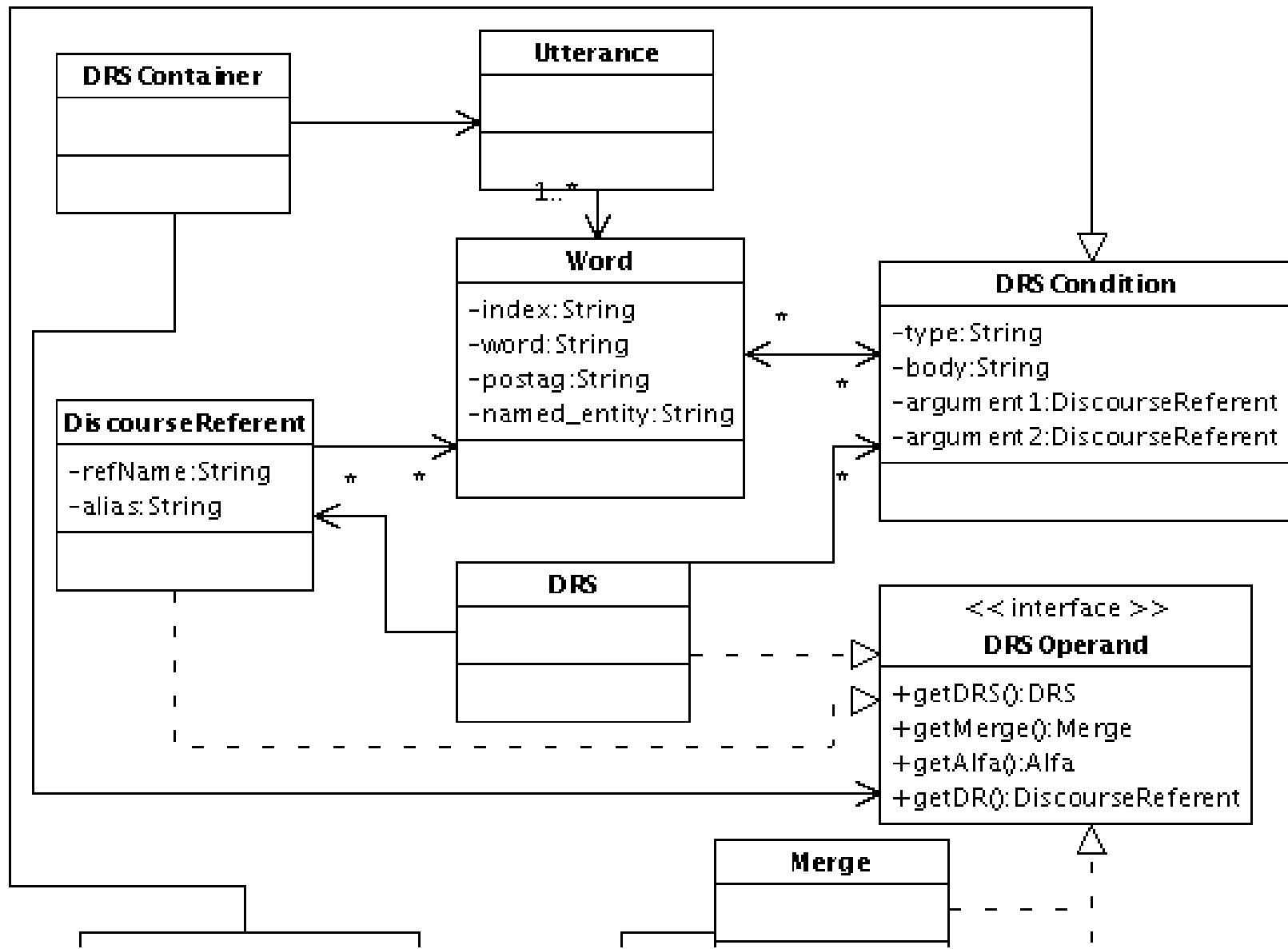
thing(x4)
on(x4, x6)
do(x3)
agent(x3, x5)
patient(x3, x4)
event(x3)

event(x1)

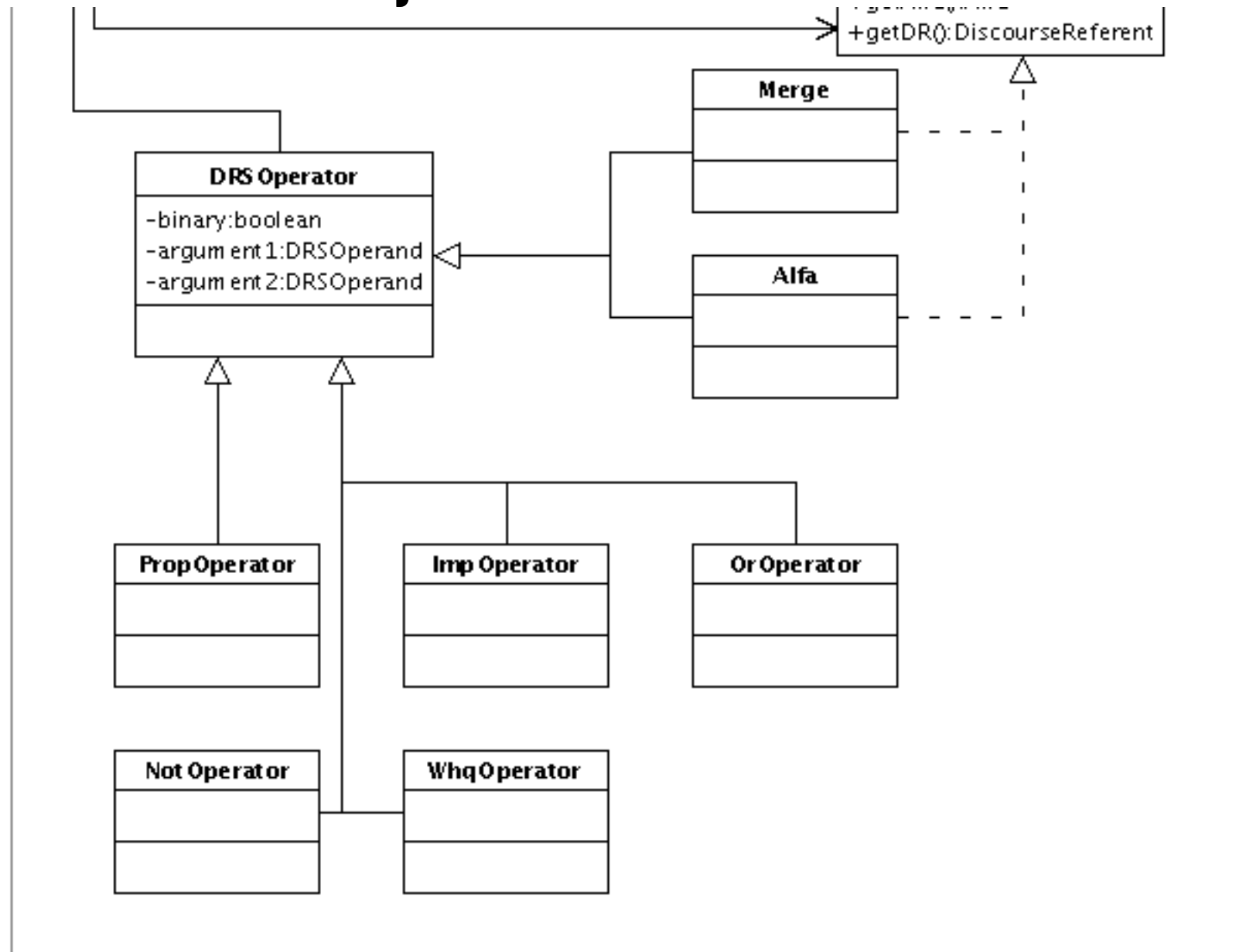
I have to do something on Sunday

Object Oriented DRS

Objective DRS representation



Object Oriented DRS



Schedule discovery in DRS

- ✓ Pre-testing
- ✓ Time prepositions
- ✓ DRS representation of prepositions

Heuristics for argument discrimination

- ✓ Lexical discrimination
- ✓ Named entity
- ✓ Listed arguments
- ✓ Case Based Reasoning?

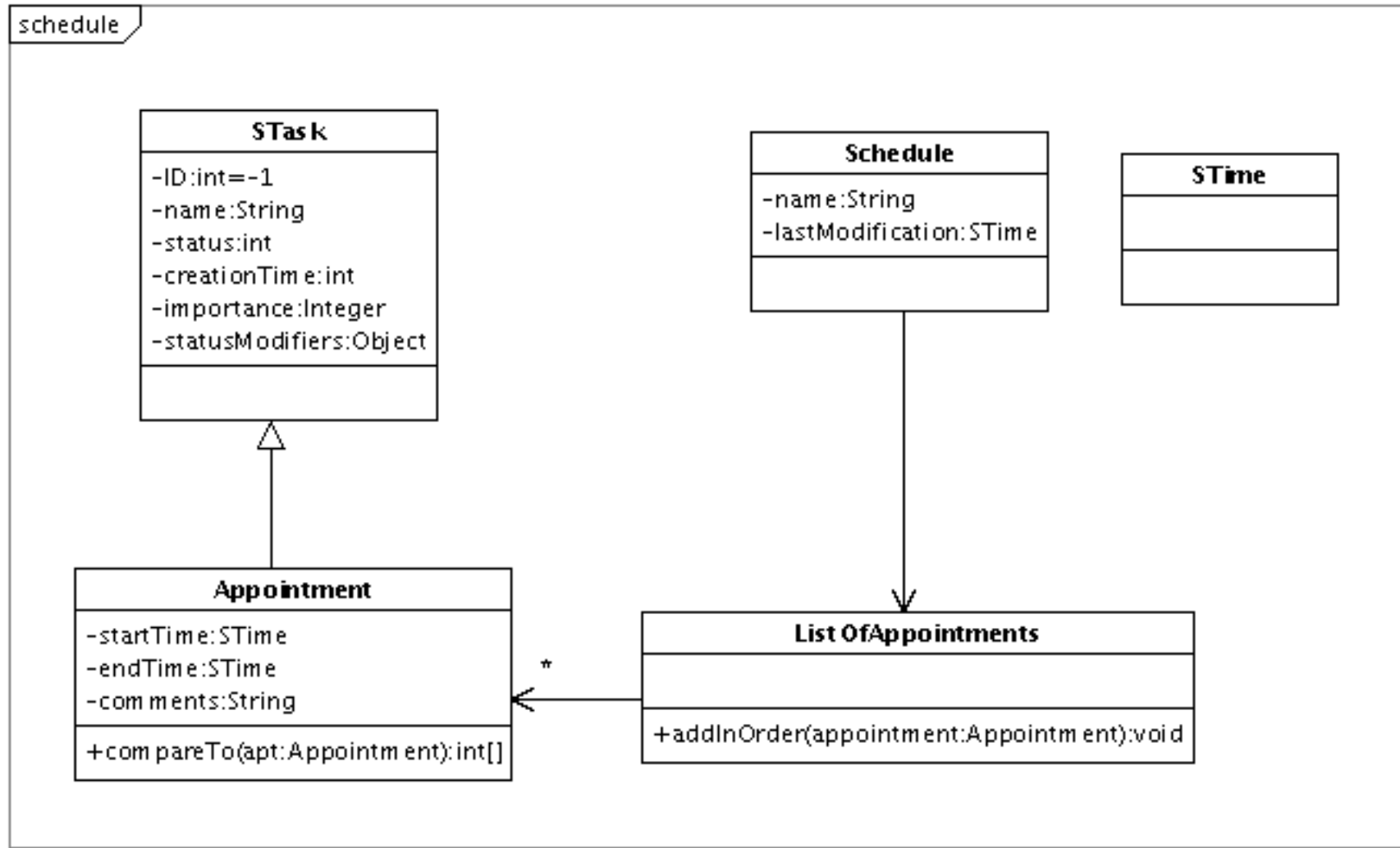
TimeEventStructure

TimeEventStructure
drModal : DiscourseReferent preposition : String timeReference : TimeReference verbalReference : VerbalReference
getDrModal() : DiscourseReferent getText() : String toString() : String getTimeReference() : TimeReference getVerbalReference() : VerbalReference setDrModal(drModal : DiscourseReferent) : void setTimeReference(timeReference : TimeReference) : void setVerbalReference(verbalReference : VerbalReference) : void

VerbalReference
agent : DiscourseReferent patient : DiscourseReferent verb : DiscourseReferent
<<create>> VerbalReference() getAgent() : DiscourseReferent getPatient() : DiscourseReferent getText() : String getVerb() : DiscourseReferent setAgent(agent : DiscourseReferent) : void setPatient(patient : DiscourseReferent) : void setVerb(verb : DiscourseReferent) : void

TimeReference
date : Date root : String timeRef : DiscourseReferent timeString : String
getRoot() : String getText() : String getTimeRef() : DiscourseReferent setRoot(root : String) : void setTimeRef(timeRef : DiscourseReferent) : void

Towards ontology instantiation



Results

- ✓74.3 % of success on current implementation
- ✓The most common unrecognized events
- ✓Reconstruction of utterance

Conclusion