



# Natural Language Scene Description

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In RobotStudio



# Problem description

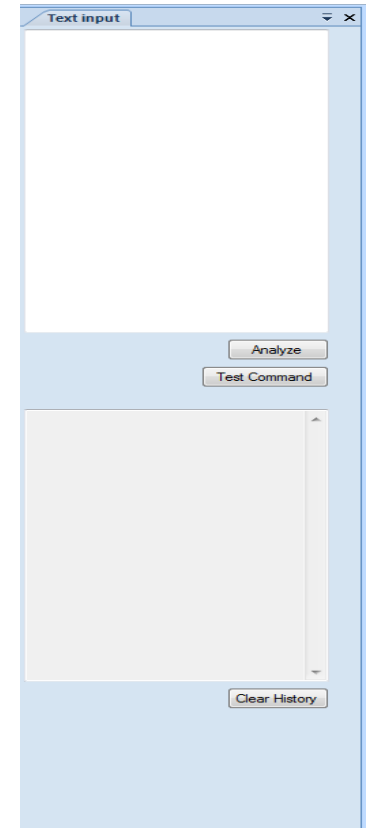
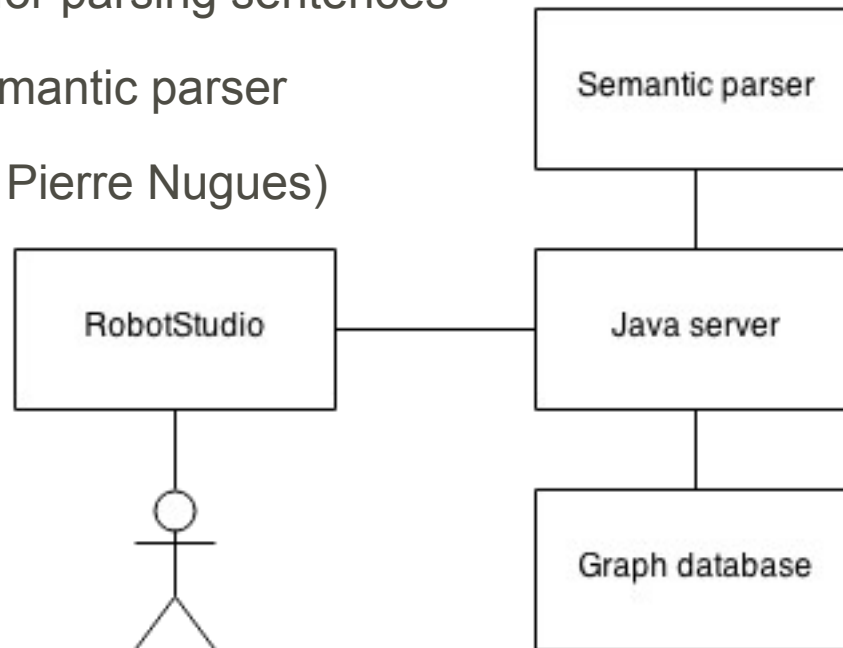
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- RobotStudio – a widely used program
- Setting up scenes manually is tedious
- Natural language would be easier
- So we create a plugin



# Our solution

- A program in several parts
- A plugin to RobotStudio for handling its contents
- A graph database for holding the state of the world
- A java servlet for parsing sentences
- A statistical semantic parser  
(developed by Pierre Nugues)



# Description by example

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- Start with RobotStudio plugin (written in C#)
- Write text in the window, click "Analyze"
- Text is sent to java servlet through http
- Java server passes text to the semantic parser

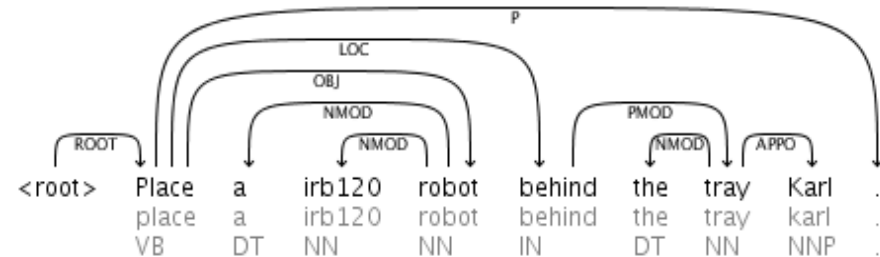


# Output from the parser

The parser returns:

- Annotated corpus
- Found predicates with mapped arguments
- Dependency Tree

	Place	a	irb120	robot	behind	the	tray	Karl	.
place.01		A1			A2				



# The Java Interpreter

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Possible Actions: create, remove and modify.

1. Identify predicates and determine action(s).
2. Identify object(s)
3. Interprets arguments



# RobotStudio Realization

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- Server compiles semantics into commands to send back to RobotStudio
- RobotStudio receives commands, executes them
- No checks made, relies on server part



# Plugin GUI

The screenshot displays the ABB RobotStudio 5.61 interface. The main window is titled "[Unsaved Station] - ABB RobotStudio 5.61" and features a menu bar with options: File, Scene Parser, Home, Modeling, Simulation, Controller, RAPID, Add-Ins, and Modify. A toolbar is visible above the main workspace. The workspace itself shows a 3D view of a robot arm positioned on a platform, with a coordinate system (X, Y, Z) visible in the bottom-left corner. On the left side, there is a "Text input" panel with a text area containing the command "Create a robot. Call it Eddie." Below this panel are buttons for "Analyze" and "Test Command". At the bottom of the interface is an "Output" panel showing a log of messages:

Show messages from:	Time	Category
All messages		
New station created.	2014-05-23 12:56:06	General
The system could not be created because there is no RobotWare release defined	2014-05-23 12:57:50	General
Imported C:\Program Files (x86)\Lund University\AddinExample\pcb.sat	2014-05-23 12:58:33	General
Object positioned [2]	2014-05-23 12:59:06	General

In the bottom right corner of the interface, the "Controller status" is shown as 0/0.



# Problems & Future applications

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- Not all sentences understood – limited by all involved programs
- Needs polishing + bugfixing
- Could be written to use more abstract representation
- Combination with speech synthesizer could be interesting
- Much of the work was understanding RobotStudio, Neo4j, etc.





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