

# Experiments of Robotic Assembly Instructed by Situated Natural Language

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## Abstract

Robots in the future are envisioned to become versatile helpers of man. Major challenges are to make them intelligent enough to enable flexible and robust human-robot cooperation in shared workspaces and, moreover, to provide a simple, intuitive communication link between humans and robots. In Bielefeld, Germany, we follow an interdisciplinary approach involving linguistics, cognitive psychology, artificial intelligence, and robotics research to tackle these challenges [2]. This video presents experimental results in using situated natural language for the instruction of robotic systems.

First, the *CODY Virtual Constructor* demonstrates several examples of interactive assembly in a virtual environment. The basic scenario is the assembly of a toy airplane from the parts of a wooden construction kit. Since the changing situation in the task environment is dynamically conceptualized, not only single parts, but also constructed assembly groups, can be referenced in natural language instructions [3].

Second, a *real robotic system* demonstrates the construction of a sub-assembly of the toy airplane under instruction in natural language. This “bi-manual” robot consists of two cooperating manipulators, several cameras and force/torque sensors [1]. Visually supervised motion and sensor-based learning control enable robust performance of elementary operations like grasping, insertion and screwing [4].

## References

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