



# Managing Situated Dialogue in Collaborative Activity

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Talking Robots@IT  
making robots that make sense  
<http://talkingrobots.dfki.de>

## Problem

these experiences are inherently **uncertain**.

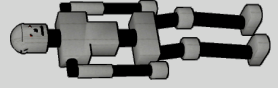


builds up models of the world.

the robot sees things,



the robot and the human are to **talk** to each other, and do things together.



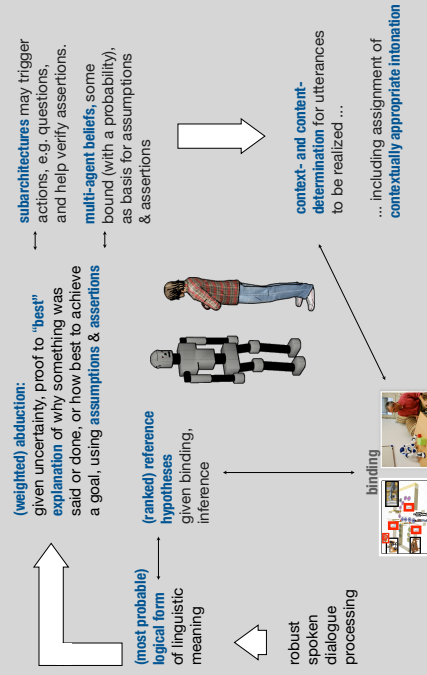
so, despite its own uncertainty, the robot needs to figure out what the **human** is talking about.

and, how it is to **act** on what the human says, or how it could coax something out of the human.

all the while realizing that the human (also) has **her own way** of looking at things!

The robot and the human are jointly involved in a collaborative activity. The dialogue between robot and human is part of that activity. We need to try to establish common ground: in how to act on what is said, on what is done, and on what is to be done.

## Overview



## Approach

- State-of-the-art
  - Models of collaborative dialogue based on what agents believe, do, can do – and say (Grosz, Sidner *et al*; Stone *et al*)
  - **Shortcomings:** Stone *et al* impose a **symmetry between production and understanding across agents**
  - **Shortcomings:** limited notion of **situatedness**, attention to **inherent uncertainty of situated experience**, and limited dynamics of **resolution**
- Contribution
  - Extension of (Stone *et al*) with **assertions** and **verifiable updates** to deal with asymmetry between agent beliefs and intentions
  - Assertions provide for a **continual approach to processing dialogue: Reflect on what information needs to be provided or verified**, driving how communication is understood, and how it needs to proceed
  - **Multi-agent beliefs and referencing** are based in **probabilistic models**, to deal with **graded understanding of experience and self-understanding**
  - A basis for dialogue in HRI, e.g. for handling questions in learning

## Example