

Robotics, AI, and machine vision

Friday, 25 October 2019 09:00 (45 minutes)

In this talk it is presented the semantic-reasoning module of VIRBOT, our proposed architecture for service robots.

We show that by combining symbolic AI with digital-signal processing techniques this module achieves competitive performance.

Our system translates a voice command into an unambiguous representation that helps an inference engine, built around an expert system, to perform action and motion planning.

First, in the natural-language interpretation process, the system generates two outputs: (1) conceptual dependence,

expressing the linguistic meaning of the statement, and (2) verbal confirmation, a paraphrase in natural language that is

repeated to the user to confirm that the command has been correctly understood.

Then, a conceptual-dependency interpreter extracts semantic role structures from the input sentence and looks for such

structures in a set of known interpretation patterns.

We evaluate this approach in a series of skill-specific semantic-reasoning experiments.

Finally, we demonstrate our system in the general-purpose service robot test of the RoboCup-at-Home international competition, where incomplete information is given to a robot and the robot must recognize and request the missing information, and we compare our results with a series of baselines from the competition where our proposal performed best.

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