

The Receptionist Robot*

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ABSTRACT

In this demonstration, a humanoid robot interacts with an interlocutor through speech and gestures in order to give directions on a map. The interaction is specifically designed to provide an enhanced user experience by being aware of non-verbal social signals. Therefore, we take spatial communicative cues into account and to react to them accordingly.

Categories and Subject Descriptors

I.2.9 [Artificial Intelligence]: Robotics—*human-robot interaction*

General Terms

Design, Human Factors

1. COURSE OF ACTION

The iCub robot[3] is placed behind a receptionist desk with a map of the university campus (or floor plan) waiting for potential interlocutors. Visitors can approach the robot and ask it in which direction to find places certain. Speech and also deictic gestures to locations on the map between them can be used as a reference for the inquiry. The robot in all cases uses both speech and gesture in its answer to indicate the correct direction to the visitor. For referencing the target, iCub is capable of referring to the map and locations in the real world. Fig. 1 illustrates the scenario setup with the robot behind a desk.

2. REALIZATION

The overall interaction is realized with the help of a dialog module, a 3-d vision stack based on an external camera, motor control components, and a pre-modeled map of the

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surroundings. All of these components are extended to recognize implicit spatial signals sent by the interlocutor and to display them as well.

The actual interaction is opened based on a spatial attention strategy that allows the robot to gradually indicate availability and interest in helping the human interlocutor[1]. Therefore, the robot is able to initiate a dialog and offer services by itself on detecting a human in its social interaction area.

For spatial awareness in face-to-face interaction, the robot maintains a model of human activity in its close surroundings called the active peripersonal space[2]. With the help of such a model, iCub can make assumptions on where to point at (map or real world), which hand to use, and whether there is the need to use spatial prompting for reaching a target. Additionally, its spatial awareness enables the robot to modify the duration of the gesture and whether to use gaze or not.

The proposed demonstration is an example on how to successfully enhance a robot with social interaction strategies in the domain of spatial awareness for a better user experience during human-robot interaction. Aside from the demonstration session, the robot could also be installed at the conference front desk to serve the conference participants to find their way to the next talk.

3. REFERENCES

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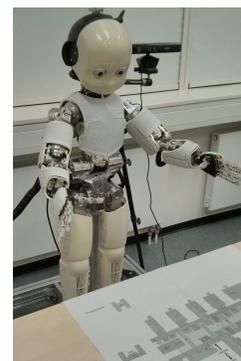


Figure 1: Depiction of the demonstration setup.