Predicting Object Transfer Position and Timing in Human-robot Handover Tasks

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Abstract

Handing-over objects is the foundation of many human-robot interaction tasks. Toward seamless and effortless hand-overs, it is desirable for a robot to predict human motion and plan its own motion accordingly. In the scenario of human (giver)-robot (receiver), we propose to enable the robot receiver to predict when and where the object will be transferred, so that it can actively reach out and pick up the object instead of passively waiting for the object to be presented. To generalize this motion prediction problem, we collected data on human reaching motions in a 3D workspace, to test the performance of arm motion models and linear regression models we propose for end time and position prediction. Preliminary results from some of the proposed models will be reported. Future work will thoroughly compare the prediction performance of all the proposed models. These prediction algorithms will be implemented on a humanoid robot for tele-nursing, with which human-robot hand-overs are compared to human-human hand-overs.

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