Implementation of robot navigation control for human-robot interaction.

This project will be part of a larger project to develop the Guide Robot “Nicole” who will guide visitors through the ISR while navigating autonomously and interacting with the people. The fashion of interaction will be giving information to the visitors and reacting on gestures performed by people Nicole knows.

Besides common robot navigation task e.g. follow a path, explore the environment and avoid obstacles social robots also need to navigate to accomplish an optimal interaction with a human. The work will be based on a system using a “Scout” robot equipped with a static monocular camera. This means that the robot needs to adapt its orientation and distance to the human in order to establish the human’s frame of reference for further gesture recognition. A further change of the distance will occur when Nicole changes to facial expression recognition. The work also investigates the realization of an attention mechanism but saccadic rotations.

The realization of the project will consist of a primary phase (T1, 1 month) to test basic robot navigation and path execution. The next phase (T2, 3 month) is the implementation of the visual cue combining the already implemented head and hands tracking algorithm.

The project will deliver a prototype, one internal and one final report and the oral presentation of the results. The project will be situated at the Instituto de Sistemas e Robótica do D.E.E.C. (Laboratório de Robótica Móvel).

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