

Cognitive stimulation through task-oriented telerobotics

The project presented here consists of a flexible platform to assist end-users in performing a series of mental tasks with a sensitized mobile telerobotic platform, in order to mitigate the problems associated with a cognitive disorder. Such platform is expected to increase the motivation of the subject which, therefore, improves performance of the cognitive stimulation. CSTT (Cognitive Stimulation Through Task-oriented Telerobotics) is composed by the Telerobotic platform along with the CognitiveTask UI application which guides the user through the different steps of the task.

The hardware used for the desired functionalities for the Telerobotic Platform is the ePuck, an education/research low-cost robotic system. The ePuck is a small (7 cm) differential wheeled mobile robot that includes a lot of different elements like LEDs, microphones, a loudspeaker, a color camera or infrared proximity and light sensors allowing many different techniques to be applied. The ePuck robot is prepared for navigating in complex spaces and compiling information from the context by means of the sensory system incorporated. In this project, the robot will be placed on a white surface with black lines to perform the different tasks enabling automated remote navigation.

The User-Interface will be provided by a tablet with the open-source Android OS, flexible and portable enough for an extendable platform. Indeed, Android offers a complete professional environment for incorporating the logic associated for a proper user experience.

The following list describes the different task to be proposed to the user adjustable according to the user profile and needs:

- The user is given initially four destinations on a map which he has to remember, and send the robot to in the correct order.
- With a virtual joystick, the user has to move the robot and keep him on top of the black line as much time as possible.
- Using the LEDs of the robot, at the beginning a pattern is shown, which the user has to memorize and then recognize in the following random patterns.

