



Designing Interactions for the Baxter Research Robot

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My project's goal was to design interactions for the Baxter Research Robot. Initially this involved working on the Baxter's arm control system. I continued development on our homemade joint torque controller, which allows the robot to move faster than the inbuilt controller. My second mini-project involved creating a script that implemented several algorithms that allow Baxter to attempt to match the speed with which a user claps hand with it. We then ran a pilot study using this script, and reported the results in a paper that was recently accepted to the International Conference on Social Robotics.

The remainder of the summer was spent designing games for elderly adults to play with Baxter that promote physical and mental well-being. All of the games involved some form of physical contact and were designed to be socially engaging. The Stretch game involved musical cues that told the user to move their arms into different positions. In the Strength game the user hits boxing pads that the robot "holds" and receives feedback based on the strength of the hits. In the Teach game, the user teaches the robot a song by moving its arms. In the Agility game, the user must hit the robot as quickly as possible in order to "awaken" it. The Clap game involves playing pat-a-cake-like games with the robot. Finally, in the mimic game, the user teaches the robot an increasingly complex series of hand contacts. These games will be used in a study planned for the coming fall.

Over the course of the summer I learned a host of skills that will be useful in my future career, regardless of whether I choose to continue pursuing research. I can now program in Python, have considerable Linux skill, and am familiar with the Robot Operating System (ROS), a platform used for interfacing with many different commercially available robots. Beyond these skills, I had the opportunity to be involved in several studies and the publishing of several papers.