Objective

Handing over objects to and from humans is an important skill for robots. In our past work, we tackled how to exchange objects between robots and objects in a safe manner. However, our recent review paper on object handovers shows that no research has looked at object handovers as the robot moves. The objective in this project is to develop an approach that would enable human-robot handovers as both the robot and human moves. We intend to study situations where the robot is the giver or the taker and the movement of the agents are either in opposite directions or same direction (i.e. baton passing).

Project Details

This project will be implemented on a Fetch Mobile Manipulation platform. The focus of this project will be on the human-robot interaction aspect rather than the algorithmic development of the handovers. The project will have 4 milestones:
1) Detecting/tracking the human's position and arm configuration with the RGB-D cameras on the Fetch robot.
2) Develop a controller that would control the robot base and the arm trajectory as a function of the distance to the human.
3) Extend the approach with respect to the role (taker/giver) and scenario (same/opposite direction)
4) Conduct user studies to evaluate the effectiveness of the developed approach - and compare it with stationary handovers.

**Prerequisites**
- Strong programming skills in Python and/or C++
- Experience with Robot Operating System (ROS)