

Multirobot coordination service

Project Advisor: Soham Sankaran (course TA)

Note that this project requires Soham to approve your team before you choose it

Multirobot systems involve many robots collaborating to perform some overarching task or set of tasks -- example use cases include logistics (Amazon's warehouse robots), surveying (drones mapping an area), construction, and, of course, farming. If we are to automate most labour in the world, thousands of different multirobot systems are how we are going to do it. There is, however, a catch -- it is incredibly difficult to write code for multirobot systems, in large part because of the coordination and contention complexities inherent in situations where multiple agents operate in the same physical (space, objects) and logical (tasks, planning) domains.

Soham's current research, advised by Prof. Ross Knepper, involves building a multirobot coordination service based on ideas from distributed systems with the hope of making it easier to build new multirobot systems in a modular fashion. In particular, this project will involve building a scalable shared partially-ordered log that is written to by sensor-connected (camera, lidar) services and read by actuator-connected (robot locomotion, arms) services which perform actions. This log, which will run in the cloud, will be written to and read by various task-specific microservices.

Students working on this project would work closely with Soham on implementing this coordination service, as well as deploying it both in simulation and on physical robots. If you are interested in this project, please contact Soham directly at soham@cs.cornell.edu with a short summary of your background in programming, systems, and robotics.