Integrate depth sensor with the iRobot Create

In MAE 4180/5180 “Autonomous Mobile Robots” labs are performed with the iRobot Create. This project is to integrate a new sensor (an RGBD camera) with the robot, provide beacon and range information over wifi and integrate with the robot and a MATLAB interface used to control the robot.

This project is intended for a team of two students.

Deliverables:

- Choice of sensor, computation and mounting solution
- Well documented code for providing beacon and range information
- Demonstration of a Matlab program controlling the robot based on range and beacon information

Requirements: Programming experience. Familiarity with RGBD sensors a plus.

Professor and contact: Hadas Kress-Gazit (hadaskg@cornell.edu)
Course number: CS4999/CS5999/MAE4900/MAE6900
Credits: 4
Feedback and Formation Control for Foldable Swarm Robots

In this project, you will work on 80% software and 20% hardware design for a group of foldable robots. Specifically, you will:

1) Extend the number of existing foldable robots and put markers on robots for tracking.
2) Design a feedback control scheme to make robots navigate to given goals.
3) Design a formation control scheme to make robots form a desired 2D shape.

Future work: this project is going to be continued in 2019 Spring and participate the RobotArt competition (https://robotart.org).

Preferred but not necessary skill sets: programming experience in Python

Professor: Hadas Kress-Gazit (hadaskg@cornell.edu)

Course number: MAE4900/ MAE6900/ CS4999

Credits: 3-4

Contact: Ji Chen (jc3246@cornell.edu)