

Stop! In the Name of Love

Capstone Python Project

CSSE 120, Introduction to Software Development – Robotics
Winter term, 2012-2013

In the Features that follow, each team member must be the lead developer for one **BLUE** feature and also the lead developer for one **YELLOW** feature. To earn a passing grade on the project:

1. You must complete your **BLUE** feature. (In all cases, to “complete” a feature means to implement at least the fundamental aspects of that feature, using reasonable algorithms and code.)
2. You must complete your **YELLOW** feature.
3. Your team must complete the **BLUE**, **YELLOW** and **GREEN** features, along with at least some other features.
4. Every method in your code must have a brief, appropriate doc-comment.
5. Your code must be of high quality. In particular, it should use the style guidelines that we have modeled in all our examples.
6. You must maintain your Task List throughout the project.
7. You must be an appropriate team member, including completing weekly surveys on your team’s performance.
8. 4-person teams: See your instructor for adjustments to the above.

Features:

1. The robot supports **teleoperation of linear movement**. *Teleoperation* means that the robot moves under continuous control by a human operator. Control can be via the keyboard, buttons, external devices like a Wiimote, etc.
2. The robot supports **teleoperation of rotational movement**.
3. The robot supports **teleoperation of combined linear and rotational movement**.
4. The robot supports **non-teleoperated movement**. For all such movement, a single user-interface action (e.g. pressing a button) initiates motion like: move until you run into something; move X feet (where X is entered via the GUI); go to coordinate (X, Y) (where you begin at (0, 0)); etc.
Teams of 4: One person does movement in a single dimension, the other does two-dimensional movement.
5. The robot **follows a curvy black line**, stopping when the IR hears a given message.
6. The robot **follows a curvy wall**, stopping when the IR hears a given message.

7. The robot **follows another robot**, where it “sees” the lead robot via IR that the lead robot emits, and it stops when the lead robot sends a given message.
Teams of 4: The robot **follows another robot**, where it “sees” the lead robot via the camera, and it stops when the lead robot sends a given message.
8. The robot **talks and hears messages via IR**, via protocols that you are given and also via protocols that you develop.
9. The robot **offers Rogerian psychotherapy, ala Eliza** (<http://en.wikipedia.org/wiki/ELIZA>).
10. The robot **sings, dances and plays a light show**.
11. The robot **finds objects using its camera**. [This feature, and all with the camera, is CANCELLED.]
12. The robot does interesting things with vision, e.g. using semaphores to communicate (look up naval communications).
13. The robot uses **swarm techniques and/or distributed algorithms** to accomplish interesting things.
14. The robot uses **parallel algorithms** (in processes and/or threads, in a single processor or across cores) to accomplish interesting things.
15. The robot **displays certain information** TBD but including:
 - a. A brief description (possibly fanciful) of this project, along with the course name and term.
 - b. For each team member: her name, a short (fictitious if you like) bio, a list of the main features she was responsible for, and (**updated at the end of each Sprint**) the total person-hours she spent on the project during the Sprint.
16. The robot has a **nice GUI** (all members must contribute to it).
17. The program uses files to do interesting things.
- 18.
19. **Other hardware:** Does your robot use external sensors? Motors/servos? For interesting purposes? Does your robot’s control use multiple cores?
20. **Your robot ... [You suggest something interesting!]**