Final Project
Engr 132 – Intro to Robotics

For your final project you will get a robot to execute a "new" behavior. You may use the existing Shield BOT hardware. If so, it must be different than the standard "canned" lab exercises. It may be a combination of different behaviors or sensors used before. You may also ADD with new sensors or hardware. Completely different hardware is also acceptable but get the instructor's approval.

GENERAL REQUIREMENTS (grading based on these items)
1. Select a project and get instructor approval
2. Create a robot behavior or machine that goes beyond our exercise book
    (proper difficulty, challenge, creativity, originality, or ingenuity)
3. Use new sensors or hardware (preference: sensors used to control servos)
4. Option - use existing hardware but combine at least 3 prior techniques
5. Contribution to the project (if group projects are done).
6. Custom code must be written (not just copied).
7. Submission - demo your project to the class, submit code to instructor, submit short video on Canvas
8. Borrowed SAC hardware - disassemble and return by end of semester.
9. Complete all required items on time (due at START of class on due date)

Note - fully-purchased kits are discouraged.

HARDWARE AVAILABLE
There is hardware that you can borrow to do your project. This includes:
- encoder kits (to sense and feedback wheel movement)
- QT line follower kit (to follow a line but works better than our IR sensor set up)
- Ping ultrasonic sensor (distance detection) with possible servo/mounting kit to pivot the sensor
- IR sensor (sense distance like the one we used, but built into a package)
- PIR (passive IR) – sense presence like those for security lights
- 2-axis accelerometers (sense accelerations)
- tilt sensor (similar to an accelerometer to sense tilt)
- gyroscope sensor (sense rate of change of rotation – great for balancing robots)
- OLED displays

KITS:
- Crawler kit (makes a "hexapod" out of the robot)
- Gripper (adds a gripper to the front of the robot to pick things up)

IDEAS/ PAST PROJECTS:
- sensors being used to control servo motors
- robots that play songs while moving and flashing lights
- blue-tooth phone or RC controlled robots
- hover-craft
- balancing robots
- "car" with lights (headlights, rear lights (auto-on when dark), brake lights (when slowing), turn signals.

- DIY robot arm
- line follower
- LCD/OLED displays
- rovers