

**ECSE-2350**

**Embedded Control**

**Final Project Discussion**

# The Final Project:

- An open ended exploration of features, functionality, and possibilities.
- There are two “options”
  - Solve a generic problem posed to the class, or
  - Make the car or microcontroller do something interesting

# The Generic Problem:

- Racetrack:
  - Racetrack will consist of an inner barrier that cars must drive around.
  - It will be reconfigurable:
    - Barrier can lengthen, widen, be a rectangle/oval/etc.
  - Car must stay within a required distance to the barrier.

# Racetrack Following:

- Question: How do you follow the barrier?
- Answer: I don't care\*!
  - Consider different ways to solve it, pick one and go to town.
  - \*Only limitations are
    - no Hard-coded routes (Lab 3)
    - No Simplistic wired controls for \*direct driving\*
    - Computer cannot be connected to car \*when driving\*.
      - Exception: Can leave it connected to take data for report.

# Ideas:

- **Bump and Run:**
  - Use the bumpers to detect when the car hits the barrier
  - Back up, turn, drive, turn until another hit, etc.

# Ideas:

- **Ranger:**
  - Use the ranger to detect the barrier and follow it or...
  - Add markers to track to tell car when to turn
- **Compass:**
  - Place a magnetic track following the barrier and follow the track.

# Ideas:

- Guided:
  - Instead of autonomously driving, provide user controls:
    - A wireless “remote control”
    - Track dimension entry into running program (like Lab 1):
      - Pushbuttons, etc.
      - Terminal
      - a keypad (I2C keypads available)

# Ideas:

- Guided:
  - Provide additional navigational signals to car:
    - Use light sensors and a flashlight to tell the car where to go.
      - Triangulation of light source with multiple light sensors, or
      - Spin in place to find maximum light, drive towards.
    - Line follower!
      - Add tape to floor for car to follow (see: IED)

# Other Final Projects:

- Generally free to do a wide variety of things, anything that might interest you.
- You must OK your idea to either myself or Neti if outside of these suggested.
- Whatever you decide to do, please submit a project “proposal” (just a couple sentences) to gradescope so we can track who is doing what.

# Final Project Grading:

- Demonstration of functionality: **50 %**
  - Show that your project will function in pieces even if as a whole it is unsuccessful or
  - 3 successful laps of the racetrack.
- Successfully completing 3 laps (or other goals): **0 %**
  - No requirement on success rate, we just want to see that you put in a good effort (above).
- Final Report **50 %** - Rubric is on website

# Contest:

- Final Class days will have a fixed “final” track set up.
- 3 Fastest cars timed over 3 laps will receive:
  - ...something small and recognition.
  - Don't get your hopes up for anything fancy

# Final Project Summary

- We want this to be fun and interesting
- Make sure to work on this early – don't wait until the last class!
- Anything else?