ECE 100 - ITP

Lecture 3 (no class due to Labor Day)

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Questions?

- Email List for ECE 100
  - You're responsible for all email announcements
  - Did you see the email feedback on Pre-Lab 1? Helpful hints were sent out.
  - Questions should be sent directly to me, not to the ece100-12f list
- Policies
  - Posted on ECE 100 web site
  - Late arrival is equivalent to a missed lab
  - Assignments are due at the beginning of lab
  - Each missed lab will result in a "letter-grade-demotion"
- HandyBoard and Interactive C
  - There is a lot to learn (Appendix E.1), so let me know if you have any questions

Lab 1 Observations

- HandyBug is a starting point for your robot design.
  - Part substitution is common, but ask if you're unsure.
  - Structural integrity is important, especially for touch bumper.
  - Route wires along shortest path. Don't stretch/pull wires.
  - Don't force it! Robot components are fragile!
  - Axle lengths are based on LEGO studs, e.g., 1x6 beam.
  - Touch bumper should be sensitive to small force and able to differentiate left/right.
  - If a hub slips inside a tire, then use a small piece of a rubber band between the yellow plastic hub and the black rubber tire.
  - Use cross-bracing beams and pegs to secure the HandyBoard to the robot.
- HandyBoard problems:
  - If no "heartbeat", then power cycle HandyBoard. If board continues to freeze, then hold "start" during power cycle, and try simple fd, bk commands.
  - Be careful with sensor pins (4-pin wide plug) - improper placement can short out the entire board, which is a $300 mistake!

Post-Lab Reports - General Comments

- Follow the format of the Design Portfolio, including
  - Problem Statement: Design and construct a robot that can avoid obstacles using two touch sensors: one each on the left/right side of the touch bumper. Investigate basic operation of the HandyBoard and Interactive C.
    - Criteria: How will you choose among competing designs? This is important in later labs when choosing an optimum solution.
  - Research/Investigation: Include previous background material.
  - Alternative Solutions: Include flowcharts and detailed description.
  - Optimum Solution: Include reason for choosing (req. in Lab 3); State your plan.
  - Construction/Implementation: Explain hardware/software configuration based on lab notes. List each team member's role (KC, PP, HH).
  - Analysis/Testing: Describe performance and testing process. Answer questions in previous Post-Lab assignment slides.
  - Final Evaluation/Conclusion: Success - why/why not?, Problems Encountered, Future Work
  - Attachments: modified code, lab notes
- Include laboratory teammates' names on post-lab report. Get the dates right. Figure out which section you attend. Check out the Post-Lab Report template on the ECE 100 web site.

Presentation in lieu of Post-Lab 3 Report - week of Sep 17

- Follow the format of the Design Portfolio, including
  - Problem Statement: Design and construct a robot to navigate an unknown maze in the shortest time possible.
    - Explain constraints and criteria for subproblems.
  - Research/Investigation: Present a theory for optimal performance.
  - Alternative Solutions: Discuss your strategies via flowcharts & code.
    - Describe subproblems with short sections of code.
  - Optimum Solution: Why was it chosen?
  - Construction/Implementation: Describe robot hardware/software configuration, e.g., "as-built" description.
  - Analysis/Testing: Report outcomes from repeated trials. Discuss modifications/improvements.
  - Final Evaluation/Conclusion: Submit your IC code as an appendix.
    - Problems?, Adequate Solution?, Future Work?

Team Presentations (in place of Competition Post-Lab Reports)

- Due in your laboratory section the week of September 17.
  - Ten minute PowerPoint presentation, roughly 8-9 slides. No Flash!
    - PowerPoint 2003 and 1024x768 resolution LCD projector.
  - Each team member should present an equal share.
    - Three-to-four person teams: 2-3 slides each.
    - Two person teams: 4 slides each.
- Topic: autonomous robot design proposal
  - Presentation should be directed to your firm's engineering management.
  - Details/numbers are critical to persuading management.
  - Good presentations use diagrams/pictures to illustrate concepts.
  - Provide a framework similar to the Design Portfolio.
  - Consider the qualities of a "good product". How many does your design exhibit?