

Lab 7: Project Management

Vashisht Madhavan

Anthony Castro

Stephen Martinis

Lab Instructor : John Finn

October 14, 2014 - October 20, 2014

Introduction

The purpose of this lab was to learn the basic skills of project management and understand basic tools for collaboration like subversion. We also took time in this lab to think about design ideas for the final project and make those ideas concrete in trying to complete a project charter. We also created a Work Breakdown Structure to ensure that work gets completed on time and is divided evenly between different facets of the project.

Analysis

1. Setting up a Remote Repository

Instead of using SVN, as specified in the lab, we used GitHub as our version control tool of choice. We found that this was probably the best option, as all of us had previously set up accounts and were familiar with the git command structure. Below is a link to our remote repository with the project charter uploaded.

<https://github.com/VashishtMadhavan/EE149FinalProject>

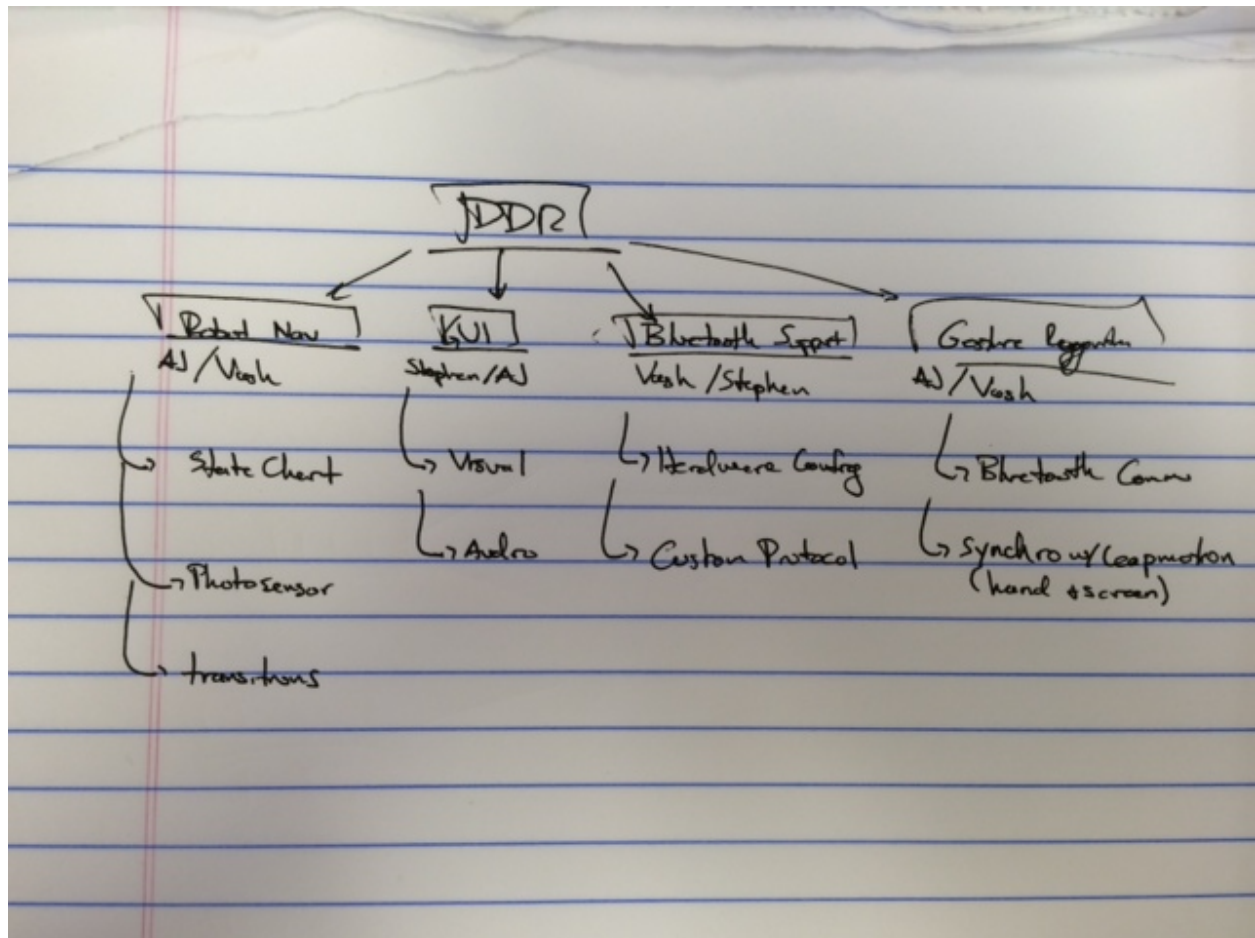
2. Project Plan

We decided to stick with the original team members from the labs. It was easier since we were already comfortable with working with each other and had similar interests in terms of the direction of the final project. Our project was basically navigation of an iRobot along a specified path, using a GUI and hand gesture recognition with a LeapMotion. The iRobot would only move correctly on the path if a user's gesture matches the gesture description on the screen.

The full description can be found in the project charter...

3. Overview of Work Breakdown Structure

We basically split our work breakdown structure into the main components of the overall design and implementation: User Interface, Gesture Recognition, Bluetooth Support, iRobot Navigation, and Presentation and Demonstration. Our WBS is shown below



Note: Individual Writeups are attached to this report...

Conclusion

This lab was much less technical than the previous ones, but it taught us some useful methods to manage our time and set concrete goals for our final project. The ideas of a project charter and a work breakdown structure are useful to know not just for this class, but for any group project that spans an extended period of time. The exercises with subversion helped us streamline the collaboration process and taught us a useful tool used in almost all large projects in industry and academia.

Individual Writeups

Vashisht Madhavan---

(a) The critical path for my individual WBS includes setting up communication between the LeapMotion sensor to the computer so that it accurately indicates whether a user has made the correct gesture. My work also includes creating and implementing the custom bluetooth protocol to communicate with the myRio hardware. In terms of the statechart, I need to work on using sensor readings to enable accurate and synchronized transitions. With testing this part could take quite long, as it relies on multiple parts of the project working for thorough testing.

(b)(i) Design will probably take about 2-3 hours as researching bluetooth protocols and understanding a way to implement them in our system may be tricky. LeapMotion documentation and state transition design seem pretty straightforward.

(ii) Development may take anywhere between 4-5 hours as writing and testing not only testing the bluetooth protocol and learning how to use the LeapMotion SDK may take a while.

(iii) I'm going to allot the most time to debugging, as most computer scientists know that debugging is usually the hardest part. I'll say 15+ hours, because who knows what can go wrong.

(iv) I'm going to allot 3-4 hours for writing up my part of the design doc, adding to the presentation, and creating a demo video. I need to describe how the bluetooth protocol works and how the output from the LeapMotion is transmitted to the myRio via a computer (obviously in more detail).

(c) I've given enough hours of debugging to hopefully handle unforeseen errors and complications and smaller amounts of time to development and presentation aspects to possibly account for early completion. Since some tasks may take more than others in this project, if I finish early I will use the extra hours to help others with their tasks

(d) We haven't coordinated a meeting time, but hopefully we are aiming to discuss ideas and problems with the GSI hopefully every two weeks.

AJ Castro-----

A. The critical path on my WBS is going to be synchronizing the state logic with the LeapMotion gestures and photosensor. The logic for correcting behavior (undoing erroneous moves and restoring back to the original path) specifically making sure the robot gets on the original path and not some other random path seems difficult to do with the photosensor. I would suspect at least 10 hours for development and thorough testing for this part.

- B. For the robot, I expect a full day to design the state logic, synchronization, and photosensor correction. For the audio aspect of the GUI, I only expect to spend no more than 3 hours designing the tool. Development for the state logic and synchronization between the LeapMotion and robot could be done in a day. I anticipate debugging to take a week to two weeks. For the photosensor correction, I would expect anywhere from 8 to 15 hours for both development and debugging together but honestly I don't know what to expect with something like this as it's something I've never done before. The audio tools for the GUI could be completed and debugged within 6 hours. For other tasks such as reports and diagrams, I could probably do in 6 hours.
- C. Since we have week long intervals in which we do implementation, unit testing, and then integration testing based on what we have, we can detect any minor issues that would cause bigger issues in the future. I believe this provides enough time to test each unit thoroughly and account for any unexpected setbacks.
- D. A regular meeting will need to be coordinated.

Stephen Martinis---

- A. The critical path on my WBS is making the bluetooth connection between the robot and the computer work, and making the GUI for the DDR game. The bluetooth connection might be hard, but I think making the basic connection won't take that much time. A basic version of the GUI should be fairly easy to make as well.
- B. Out of 10 "time units"
 - a. Design gets 2 unit. I don't have to do much high level design, other than for the bluetooth protocol, but that doesn't appear to be that complicated.
 - b. Development gets 3 units. The GUI might be complicated to create, especially if I want to make it nice. The full bluetooth protocol might also take a fair amount of time to fully implement.
 - c. Debugging gets 3 units. Debugging the bluetooth protocol and the leap motion will probably be pretty hard, so I'll give it a lot of time.
 - d. Other tasks get 2 units. Writing presentations and reports will take some time, but hopefully not that much.
- C. The last couple weeks are scheduled to tie everything together, so if something slips or is harder than we thought it would be, we can push that back to those weeks and still complete the project on time.
- D. We haven't coordinated a time to meet with our mentor yet but we will soon.