ECE 445

Fall 2023

Weekly Semester Lab Notebook

Ground-Breaking Next-Gen Smart Pet Door

Team 2
Jeffrey Deng
Norbert Szczotka
Matthew Wei
TA: Abhisheka Mathur Sekar

Week	Task	Team Member
9/18	Begin design document Complete parts list	All
	Begin structuring app	Matthew
	Look into PCB and microcontroller requirements	Norbert
	Finish 3D model for machine shop and review with Greg	Jeffrey
9/25	Finish design document Finalize PCB design	All
	Work on app development	Matthew
	Supervise hardware and software design to ensure correctness Order all necessary parts and components	Norbert
	Check with machine shop on mechanical design and make any adjustments necessary Assist in PCB design	Jeffrey
10/2	Design review with instructor and TA PCB review	All
	App must be nearing completion. Testing not required at this point since we will need to wait for PCB to come in	Matthew
	Ensure PCB design meets all requirements based on our subsystems	Norbert
	Finalize mechanical design with machine shop to begin build	Jeffrey
10/9	Program the microcontroller Order PCB	All
	Ensure software is programmed to take care of every scenario possible based on user demands	Matthew
	Responsible for making sure PCB is able to communicate with software on the app as well as the mechanical design	Norbert
	Work on integrating PCB with the mechanical subsystem from the finalized product from machine shop	Jeffrey
10/16	Begin testing PCB with a breadboard/prototype design	All
	Identify weak/strength points in current PCB design	Matthew
	Document progress and begin data collection	Norbert
	Visualize how the PCB can be integrated better with mechanical design	Jeffrey
10/23	Begin integrating PCB with mechanical design as well as all subsystems	All
	Ensure app can communicate with WIFI module on PCB	Matthew

	Search for optimizing design, look for weak points and assist with integration and verification of subsystem connections	Norbert
	Begin mounting subsystems on mechanical design	Jeffrey
10/30	Carry out testing of product	All
	Ensure electrical connections are proper	Matthew
	Assist in both mechanical/electrical verification	Norbert
	Ensure mechanical design is proper	Jeffrey
11/6	Continue testing and making adjustments of product	All
	Data collection	Matthew
	Document all technical information related to performance of design	Norbert
	Verify that performance of product matches data	Jeffrey
11/13	Mock demo	All
	Prepare for mock demo	Matthew
	Prepare for mock demo, ensure requirements are met	Norbert
	Prepare for mock demo, transport final product	Jeffrey
11/20	Fall break	All
	Catch up on work	Matthew
	Catch up on work	Norbert
	Catch up on work	Jeffrey
11/27	Prepare final demo for instructor and TA	All
	Carryout final demo	Matthew
	Carryout final demo	Norbert
	Carryout final demo	Jeffrey
12/4	Prepare for final presentation for instructor and TA Return lab equipment	All
	Present final presentation Turn in Lab Notebook with Github	Matthew
	Present final presentation	Norbert
	Present final presentation	Jeffrey

Weekly Updates and Notes

Week of 9/18

- On schedule
- Worked on design doc and project proposal
- Started to get basic idea on how project should be built as well as the logic and control flow

Week of 9/25

- Behind schedule
- Worked on design doc
- Drew out schematic of how the circuit should be built
- Ordered parts

Week of 10/2

- Behind schedule
- Design review
- Worked on project proposal rewrite
- Ordered parts
- Layout for PCB
- First round PCB layout done

Week of 10/9

- Behind schedule
- Ordered parts
- Reworked logic in schematic (found errors)
- Second round PCB layout done
- Worked on team work evaluation
- Unit tested components (sensor, motor driver, H-bridge, ESP32 dev board) in lab
- Started camera code
    - Finished same day
- Tested camera code and camera by itself
    - Worked first try and effortlessly
- Could not connect to Illinois WiFi or hotspot
    - Demo at home?

Week of 10/16

- Behind schedule
- Worked on design documentation rewrite
- Ordered parts
- Reworked logic in schematic (found errors)
- Third round PCB layout done

Week of 10/23

- Behind schedule
- Worked on individual progress report
- Ordered parts
- Added microcontroller programming buttons in schematic (forgot to do)
- Fourth round PCB layout done

Week of 10/30

- Got on schedule
- Microcontroller code and application code has started being written
    - Finished same week
- Tried to compile microcontroller
    - Had issues with pins not working as intended
    - Changed pin variable to “const int” and it worked

Week of 11/6

- On schedule
- Tested PIR sensor with MOSFET and camera
    - Not working, voltage not high enough
    - When voltage is high, camera takes a long time to turn on
    - Changed some logic and now works
- Tested sensor with microcontroller code
    - Worked flawlessly
- Tested motor and door with microcontroller code
    - Opened and closed, but sometimes didn’t close all the way
    - Small adjustment to timers to make it work
- Most subsystems work (only need to test wireless open/close button on app)

Week of 11/13

- On schedule
- Wireless webserver code started being written
    - Finished same day

- Tested wireless webserver code with app and door
    - Worked effortlessly
- Tested camera with MOSFET for turn on after sensor detection
    - Worked, but camera takes as long time to turn on
- All subsystems officially working as intended on breadboard
- Worked on team contract fulfillment
- Did mock demo
- Soldered components onto PCB
    - Microcontroller not getting programmed properly
- Sent door into machine shop to include a box to hold PCB and other components
- Can now connect to Illinois WiFi

Week of 11/20

- No work done (Thanksgiving break)

Week of 11/27

- On schedule
- Soldered development board onto PCB as a work around
- Tested every subsystem and verified it is working
- Power converter stopped working day before demo
    - Found another workaround for power
- Did final demo
- Started to work on final report
- Started to work on final presentation
- Did mock final presentation

Week of 12/5

- On schedule
- Final presentation
- Worked on final report