Progress Report #1

Interactive Touchscreen for Rhesus Macaque

BME 200/300

09/11/2025

Team Members: Logan Olivera (co-leader), Kalob Kimmel (co-leader), Jackson Stewart (communicator), Andrew Dirkse (BSAC), Sameer Bhatt (BWIG), Charlie Fischesser (BPAG)

Project Statement: To design a modular, raspberry pi based interactive touchscreen, with a corresponding liquid dispensing to observe and understand the cognitive function of complex neural systems.

Current Project Status: As the project is still very fresh, the team is still in the research and brainstorming phase. In the previous week, the team met with their advisor and client to discuss the general structure of the project and outline general needs for the project. The team is leaning towards a raspberry pi based touchscreen system but further research is needed. The current objective is to complete this phase by the beginning of next week (15th of September).

Difficulties/Questions: No overarching difficulties in the present state of the project. The team needs to know the general power structure for giving the device power as well as the need to discuss the failing system for the device.

Current Design: N/A

Materials and Expenses: N/A

High Level Team Goals for Next Week: The main goal for the following week is to discuss and converge on a design as a team and begin documentation of this design. This will include concluding research this week, discussing what system to use as the basis for the touchscreen and how to dispense the liquid reward. Documentation includes regular lab archive work and the PDS to be completed (Design Matrix included here).

Individual Progress:

Logan Olivera – This week, I got oriented to my group as well as the project we will be working on throughout the semester. Most of the week has been spent planning and brainstorming where the project should go in a general sense. I have also begun researching how to implement the raspberry pi into the system and what components will be needed (will be finished by Monday morning).

Kalob Kimmel – This week, I met with the team, advisor, and client. I made a roadmap of what I want to get out of this project, and this started with research! I researched the cage to get familiarity with it as well as a study done on the monkey species to get a feel of how they interact in studies. I also created a rough semester schedule to get a timeline down.

Sameer Bhatt - This week I met with our advisor and client for the first time and got a great high level overview of the project for this semseter. A lot of the week was general brainstorming for the goals/what we could do for the project. In addition, I researched into the raspberry pi and a touchscreen to understand how reasonable it would be to run everything through a pi and a robust touchscreen.

Jackson Stewart - This week I conducted research on the importance of Home-Cage Devices and how it affects the pyschology of rhesus macaques. I also researched other designs for these devices such as manual versions to more automated versions with motorized trays, joysticks, and screens. I also contacted Prof. Herzfeld to give the group access to the labs at wimr.

Andrew Dirkse - I got to know my teammates, client, and advisor. I received my role, BSAC, and learned how to use LabArchives to organize my research and ideas. I did some research on the Thomas Recording In-Cage Training System, the main competing design, and established some points on which we may want to make our design different. I also researched a touchscreen for Raspberry Pi and concluded that we will need to find a sturdier screen for the monkey to use.

Charlie Fischesser – I was able to meet the team, advisor, and client this week. I obtained my team role, financial. I created an excel spreadsheet to document future spendings and shared it with the team. I also researched about the rhesus macaques because, prior to this project, I was unfamiliar with the species and how they behaved.

Individual Goals (next week):

Logan Olivera – In the following week I plan to get the team together to converge on a "final" design that we will center the PDS around as well as make sure everyone has a direction to go for prototyping and documentation. I also plan to begin prototyping a basic raspberry pi touchscreen system as a proof of concept.

Kalob Kimmel – In this next week I plan to brainstorm on a lot of design ideas. Once everyone comes together with their ideas I plan on helping to facilitate a "final" design idea. For the design ideas I hope to get working on CAD to help visualize the ideas.

Sameer Bhatt - In this next week, I want to finalize an initial design for the touchscreen – raspberry pi connection and potentially even start programming it to understand

how to give rewards. In addition, I want to do some research into guidelines for the PDS to understand what regulations we will need to follow regarding the touchscreen.

Jackson Stewart - In the next week, I plan to continue researching other designs for Home-Cage training devices. I also want to look a little more into how the use of Home-Cage training devices affects the animals themselves. I also plan to help Logan with prototyping the raspberry pi touchscreen system.

Andrew Dirkse - I will attend my first BSAC meeting on 9/12 and learn about how I can facilitate communication between the students and the faculty/curriculum designers. I want to research more competing designs that have been proposed in the literature and assist Sameer in programming the software for the Raspberry Pi.

Charlie Fischesser – I plan to continue researching, focusing more on the frame of the device and options for connectivity to the cage. I also am planning on assisting Kalob in the following week on CAD ideas for the frame. I also plan to record any items/materials we will be purchasing in the next week. I am also excited to come together and decide on a "final" idea to move forward with on prototyping.

Timeline:

Project Goal	Deadline	Progress	Date Completed
Contact Client and Meet	9/13/25	100%	9/8/25
Research	N/a	N/a	N/a
Order Material	N/a	N/a	N/a
Product Design Specification	9/19/25	N/a	N/a
Design Matrix	9/26/25	N/a	N/a
Preliminary Presentations	10/5/25	N/a	N/a
Preliminary Deliverables	10/8/25	N/a	N/a
Show And Tell	10/31/25	N/a	N/a
Final Poster Presentation	12/5/25	N/a	N/a
Project Fabrication	12/10/25	N/a	N/a
Final Deliverables	12/10/25	N/a	N/a

Previous Week Goals: N/A