CS1980 – Hardware / Software Interface

Deliverable 1 – Proposal

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The task for this project is to develop software that can interface with a hardware device consisting of a raspberry pi that controls various components. These components could include a gyroscope, temperature sensor, motors, or other peripherals. This hardware will not always be available for testing and its exact specifications may be changed by the POC over time, therefore hardware will need to be simulated during development. The software to be developed should include a web server/client interface to communicate with the software controlling the hardware, lower level software for the pi that controls the hardware, and a driver to simulate the hardware. As part of the server/client interface, networking code will be needed to handle communication over the bus between the server and client and handle problems such as communication errors and race conditions. In addition to the software, documentation will need to be done. This will include a system design document, system requirement specification, and a working agreement. It will also be necessary to do quality assurance (QA) work and some form of mock budgeting according to the number of man hours each task will take.

Our team plans to use Slack and (if necessary) Google Hangouts to communicate about development and with our POC. We will also have weekly in-person meetings with our POC to learn more about the project and assess progress. We plan to use Scrum as our development methodology, with sprints every two weeks followed by meetings and code reviews. Python will be the primary development language, and Raspbian will most likely be our target operating system for the pi, although this might change. Unit tests and manual tests will be done on the code as part of QA. We plan to share QA responsibilities for our code, although this might change as development progresses. Some potential issues may arise due to the fact that this project will require learning over time and that this is the first iteration of the project developed by our POC.

**User stories:**

* As a developer, I want the web client interface to have an admin panel with debugging commands and info so that I can debug the software
* As a user, I want commands issued from the client to take less than 2 seconds to initiate a response in the hardware, so that the system is responsive enough to be usable
* As a developer, I want detailed documentation about the code base so that I can easily debug or contribute to other developers’ work.
* As a user, I want detailed documentation about the features of the system so that I can easily figure out how to use it