Subject: Automated Microbial Analysis Update

Date Sent: 04/16/2020

Hello Scott,

Despite the shutdown of society at large, we have made some good progress towards the overall design of the project. Although physical access to the system has only recently been regained, the time spent since then has not been idly wasted. We have partitioned the workload into Mechanical, Electrical and Computer Science sub groups to help with organization.

**Mechanical**

We were able to obtain the entire system (as well as the extra parts) over this past weekend and it is currently being stored at Jorian’s house. In this interim time that we have to self-quarantine, we will be focusing on creating a good method for remote updates to the system (software and hardware). Specifically for the mechanical system, we will be updating the pneumatic system and integrating it to the main PCB. This will be thoroughly tested and then integrated into the control system software. The remaining items left to update for the mechanical system are a door for sample placement/retrieval, limit switch integration, and wire management. We are planning to have these elements finished within the week.

**Electrical**

Since the last update, the Central Processing PCB has been built, tested, and implemented. Now, the PCB acts as a HAT (short for Hardware Attached on Top) to the Raspberry Pi, providing power to the Pi via its GPIO pins. This makes for a more compact design, as the Raspberry Pi no longer needs an external power supply. Furthermore, the Central PCB is interacting with the Stepper Driver PCBs via standard Ethernet cable as intended.

Documentation for the Central PCB, the Stepper Driver PCB, and the Vacuum pump has been updated in great detail, so anyone in the future can better understand and/or replicate such systems in the Electrical branch of this design. In the coming weeks, the rest of the Electrical system documentation, namely the software settings, will be updated in great detail as well.

**Computer Science**

In large part over the last several weeks, since the last update, the most of the work done on the software side of things has been geared toward documentation maintenance and updates. We are in the process of getting a test setup installed to allow for remote access to the bot system. Once this is complete we will continue to test samples and refine the computer vision as well as improve the user interface. Despite the delays in prototyping, the computer science portion of the project will remain on track to have a fully operational system by the end of the term.

In the coming weeks we will continue to integrate our designs into the system, as well as update our repositories. All of the updates we have provided in this email, as well as any future updates can also be viewed on our GoogleSite. As always, we will all be available by email to answer any questions you might have.

Thank you for your time,

Zach Bendt

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