

PROGRESS REVIEW 11: ILR10

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Team I

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Team members: Dorothy Kirlew, Mohak Bhardwaj, Pranav Maheshwari, Shivam Gautam

1. Individual Progress:

For the progress review on March 30, I worked on getting the old Oculus Prime platform working and helped Dorothy with the parking lot.

a. Hardware and Software setup for Oculus Prime

I had completed the hardware setup of the platform a week ago. The missing Molex extension connector arrived last week and that completed the hardware that was required to start the software setup. The major challenge for the past few weeks was that I was unable to power on the motherboard. With the correct hardware setup in place, I tried to power it again through the power PCB which did not work either. I finally contacted Xaxxon (manufacturer of Oculus Prime platforms) for assistance on this since the Intel documentation provided no solution to this issue.

Meanwhile I tried out the following which did not provide a solution to the problem but should be taken care of when powering up and installing OS on a new motherboard:

- Tried plugging in a monitor into the VGA port, instead of HDMI.
- Checked LED blink error codes described in the user manual
- Unplugged SSD before attempting power up
- Checked wall brick power supply-- 15V, 4A that came with the Oculus Prime Kit.
- Plugged in the wall brick supplied with the Oculus Prime Kit directly into the motherboard power jack

Ultimately, the solution was that pins 6 and 8 (the power switch of the Intel DN2800MT) had to be shorted momentarily to get the initial boot up to work, but the documentation on Xaxxon website indicated that the reset pins (5 and 7) had to be shorted.

After getting this to work, I started the software setup that involved installing the Xubuntu OS on the processor and the ROS install with OculusPrime packages and dependencies. Details instructions and troubleshooting guidance was available on the Xaxxon website which helped successfully complete this setup.

With the correct configuration settings, I was able to tele-operate the platform to move it forward and backward once. Thus, the old platform is now in functional condition. Now, there are some new challenges with it, which will be discussed later in the challenges section.

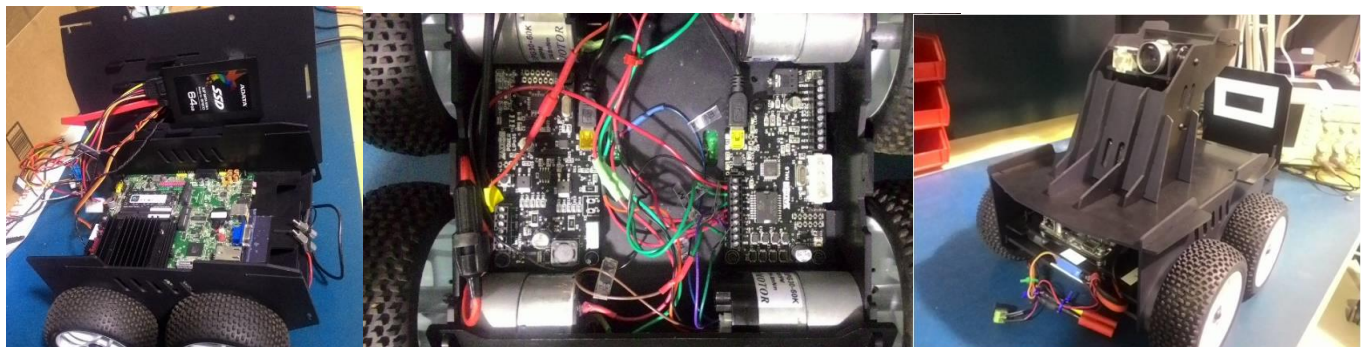


Figure 1. Fully integrated platform

b. Parking lot

Dorothy designed and constructed the final parking lot to be used in the SVE demo. After she was done with all the individual pieces, I helped her with making the 90 degree joint angles for all the walls to enable faster assembly and consistency every time the lot is re-assembled.

For this purpose, walls joined at an angle use two angle brackets to ensure they are 90°. The angle brackets are placed 6" from the top and 6" from the bottom of each corner and are located on the exterior of the lot. To ensure that the brackets can be attached and removed as the parking lot is assembled and disassembled, one side of the bracket is permanently attached with screws and the other side uses bolts and wing nuts.



Figure 2. 90 degree brackets for parking walls (Courtesy: Dorothy)

2. Challenges

A challenge that remains is the difficulty in tele-operating the platform. After working once, the Oculus Prime web application is not accepting the login info and is not granting access. A solution to this could be updating all the existing code for autonomous navigation on to the platform but there are network configuration issues that are preventing ssh as well. I am working on sorting these issues out. There is a delay in a new platform (a third one) arriving, therefore it is critical to get this working by the dress rehearsal.

3. Teamwork

I worked with Dorothy on the final stages of the parking lot. Dorothy and I also discussed the issues with the present UI and communication that need to be fixed in order for the next stages of testing to be efficient. Dorothy worked on fixing those issues. Dorothy also worked with me on fixing the old

platform. Pranav, Shivam and Mohak integrated the simulation environment and passed dummy data to show parking of multiple vehicles in simulation. They also mapped the new parking lot to test the localization and navigation of the platform.

4. Plans

From now on, a substantial amount of time will be spent on testing the entire parking routine and ironing out any bugs which might hamper the robustness of our system. I plan to carry out tests to ascertain the drift of the platform so that we have performance metrics for parking efficiency. Also, better knowledge of the state of the parking lot now with improved status messages paves way for multiple cars moving in the parking lot at the same time without crossing paths. Dorothy and I will be working on this. Shivam, Mohak and Pranav will move on to integrating and testing their simulation packages with real car parking lot data.