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Summary

For the equipments were prepared completely, we started to work on building the actual vehicles. Packages were installed on the Jetson Nano computer. The communication between ROS Master and Slave was tested. Also, searching for the GitHub repositories related to RGB-D SLAM was conducted. The blueprints of the frames were all set; therefore, 3D printer was used, however, it was not successful.

What FarmVroong completed this week:

- 3D Printing

    The frame was attempted to print out, however, the output was not successful. Creality CR-10S5 3D printer [2] with 1.75mm of filament was available. The STL file was converted to G-code format using Cura [1], which slices application for 3D printers. Fig. 1. shows the results of the first attempt output.

    This shows abnormal output result. It is judged to be a compatibility problem between the 3D design program, Blender, and Cura. The STL file was repaired using the free online STL repair by FormWare [3].

    After that, the second print was attempted. There were some parts that are not printed well.
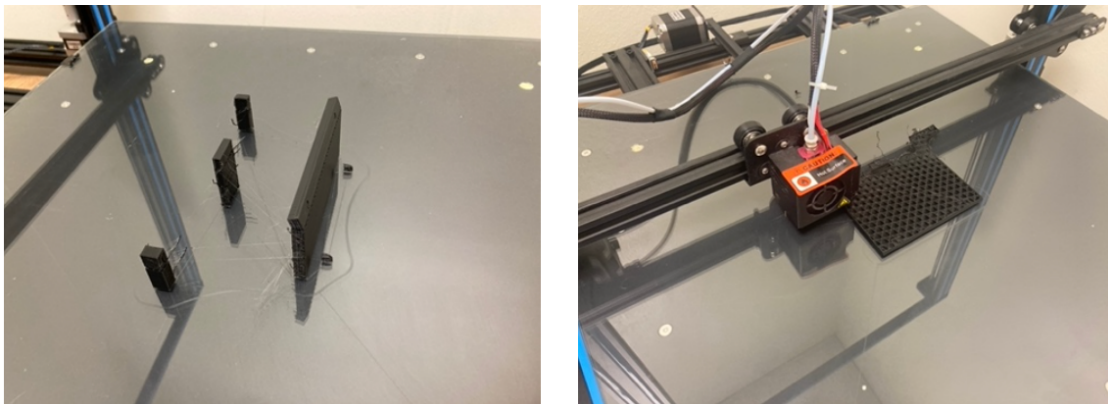

Fig. 1. (a) The results of the first attempt (b) 3D printer in progress

- Package installation

    Packages that needed such as pyrealsense, OpenCV, ROS Melodic, catkin, numpy were installed. In the field of robotics, the networks between multiple devices are needed. Therefore, the connection between the laptop and Jetson Nano was established.
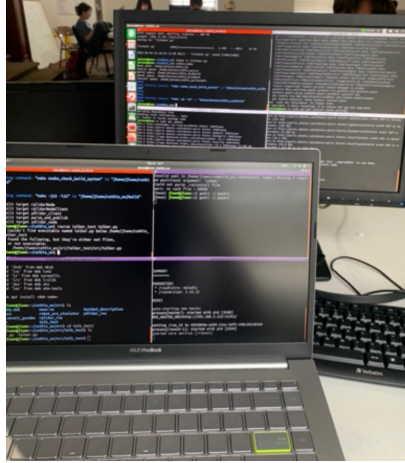
Fig. 2. Network test between master and slave computer using ROS.

Things to do by next week

- Connect Jetson Nano and servo motors so that the car can move
- Find the adequate example of implementing RGB-D SLAM in actual mobile car and analyze it
- Complete the hardware of the car by successfully printing the stand by 3D printer

Problems or challenges:

- Pyrealsense installation: Ubuntu does not support pip for installing pyrealsense so there were version mismatching problems
- Errors occurred during the 3D printing process

References

[1]   Ultimaker, "Ultimaker Cura: Powerful, easy-to-use 3D printing software," ultimaker.com, 2011. https://ultimaker.com/software/ultimaker-cura (accessed June 3, 2022).

[2]   "Creality3D CR-10 S5 3D Printer DIY Kit Large Printing Size 500x500x500mm (Random Color)," Creality 3D. https://creality3d.shop/collections/cr-series/products/creality-cr-10s-s5-3d-printer-diy-kit-large-printing-size-500x500x500mm (accessed June 3, 2022).

[3]   "Free online stl repair tool," www.formware.co. https://www.formware.co/onlinestlrepair (accessed June 3, 2022).

[4]   Keselman, Leonid, et al. "Intel realsense stereoscopic depth cameras." Proceedings of the IEEE conference on computer vision and pattern recognition workshops. 2017.

[5]   Kang, Hanwen, Xing Wang, and Chao Chen. "Accurate Fruit Localization for Robotic Harvesting using High Resolution LiDAR-Camera Fusion." arXiv preprint arXiv:2205.00404 (2022).