

Che-Yen Lu

Team E: PLAID

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## 1. Individual progress

My biggest goal for this progress review is to integrate perch from sbpl lab. The perch actually is a well-designed ros package. In ideal world, I just need to modify configuration file and make sure it can run with amazon 2017 item set.

Since Amazon only gave us point cloud and cad files are required by Perch, I use pcl converter.exe to convert .pcd file to .ply file. However, the .ply file only has point not polygon surface, so no cad model pose could be generated by Perch. I use meshlab to create normals for points and use such normals to create surface. The output and input of Perch are shown in Figure 1. As you can see, the result is pretty good although the time cost is not as good as I expect.

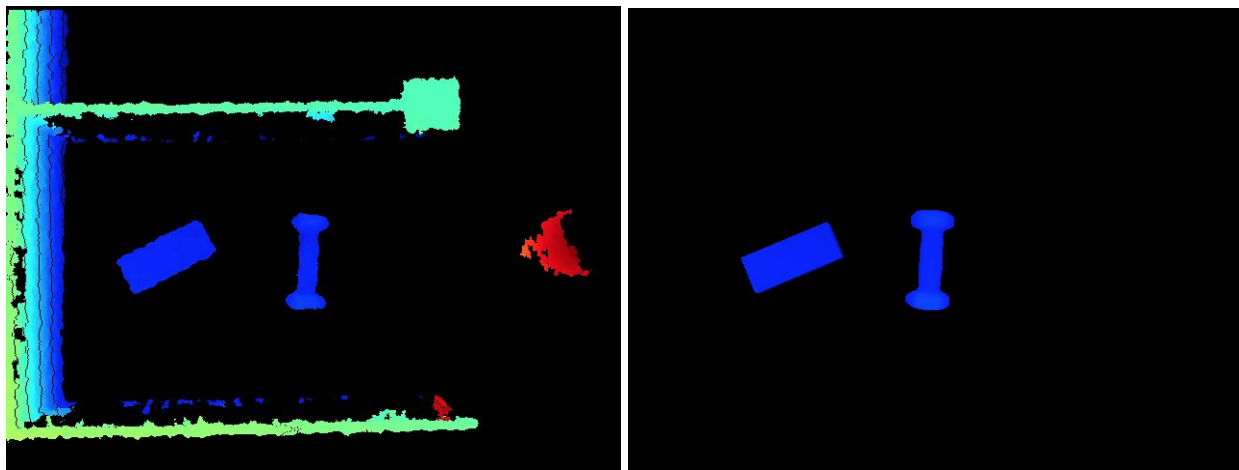


Figure 1. Input point cloud image (left) and perch 6-dof pose estimation (right)

## 2. Challenges

To my knowledge, the biggest risk now is the shelf and frame design. We are still using wooden shelf and frame, which could cause problems when whole system need to migrate from current shelf to final design. Rotary motors could be out of function. Lighting and material selection could affect the accuracy of CNN since it uses RGB color as input. From past experience, we have to reserve at least two weeks to solve all kinds of such issues. Also, the timing of shelf fabrication affects perception schedule hugely, since all training data should be got from final draw design for CNN. Without proper configuration, we can't collect images and label them for CNN.

## 3. Teamwork

For this progress, we focus on integrating MVP with new item set and break down the tasks as follows:

- Michael Beck – Project manager. Michael handles project schedule and goal. He keeps helping team to break tasks down and monitor progress of sub-tasks. He also helps team to order and assemble shelf and hardware components.
- Akshay Bhagat – Akshay and I integrate FRCNN which is trained on new item set. He also assembled the arm base.
- Matt Lauer – Matt create planning scene for linear actuator base and shelf frame. He also helped team to integrate planning service with grasping poses.
- Che-Yen Lu – I integrate Perch into our system and create stl file based on pcd file Amazon gave us. I also help team to do system integration.
- Jin Zu – Jin helps us to annotate images for CNN training.

## 4. Future plans

One of our deliverable we promise is the MVP and, finally, we get MVP up and running this time. However, there are still lots of works to do before the competition. We will review our code base with phd student, Venkat in the near future to make sure the code quality. Also, we must get shelf and frame fabricated as soon as possible. Basically, every functionality should be ready before the end of this semester. Since I will intern in california, I need to make sure everyone understand the code well.