

Report Date: 05/20/2022

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Summary

For preparing the Mid-term presentation, script and ppt were written. Also, it was researched that existing studies in off-road field, and an off-road dataset was selected for this project. Moreover, the 3D modeling of the frame for mounting the servo motor to the demo car has been completed. A Purdue student was involved, therefore, from now on, five people are working on this project.

What FarmVroong completed this week:

- Preparing the Mid-term presentation

Based on the architecture created last week, an overview of our presentation was created, and a presentation script was created. In addition, Presentation slid to be used as visual materials were designed and submitted for correction with the script.

- Researching about Off-road and Dataset

Perception of the surrounding environment is important for self-driving. Off-road and on-road scenes have different characteristics. On-road is well structured, less color contrast and balanced class distribution. However, off-road scenes are unstructured boundaries, uneven terrains, strong textures, and unbalanced class distribution. [1] Therefore, there are more limitations on off-road than on-road. Moreover, many studies have been conducted focusing on on-road field. Even though, there are relatively few off-road datasets, these were compared and one of them, DeepScene [3], was chosen for our project. This is because RGB-D Camera will be used in our project, RGB and Depth data are required.

Name	Sensors	# Annotations	# Class	Annotation Type	Modality
RUGD[2]	camera	7546	24	Pixel-wise	RGB
DeepScene [3]	camera	366	6	Pixel-wise	RGB, Depth, NIR, NRG, NDVI, EVI
Pezementi et al [4]	camera	95000	1	Bounding box	RGB
YCOR [5]	camera	1076	8	Pixel-wise	RGB
Dabbiru et al [6]	simLiDAR	2743	6	Pixel-wise	Point Cloud

Table. 1. Datasets for off-road environments [1].

Type of sensor, number of images/scans annotated, number of class, Annotation type and Modality information of datasets

- 3D Modeling

To install the servo motor with gearbox, a frame is required to connect with the frame of car. Therefore, the 3D model layout of the frame was designed using Blender and exported as STL format files. Figure 1 shows upper part and lower part of the frame. The two frames will be connected by bolts and nuts, and a gearbox is mounted on the upper part of the frame.

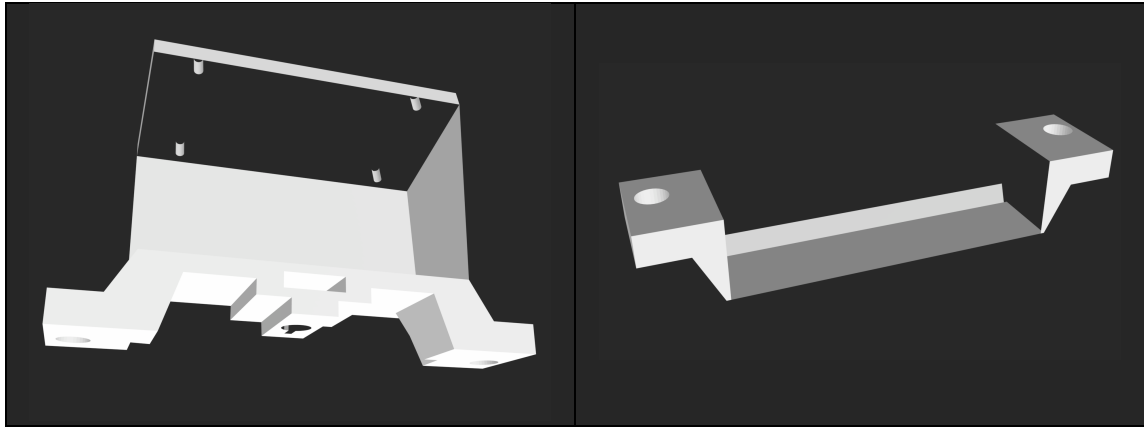


Figure. 1. (a) The Layout of the upper part of the frame (b) Lower part of frame

Things to do by next week

- Train the Mid-term presentation
- Write the Draft Paper
- Print and install the frame and motor

Problems or challenges:

- Required 1.75mm of filament to operate 3D printer

References

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