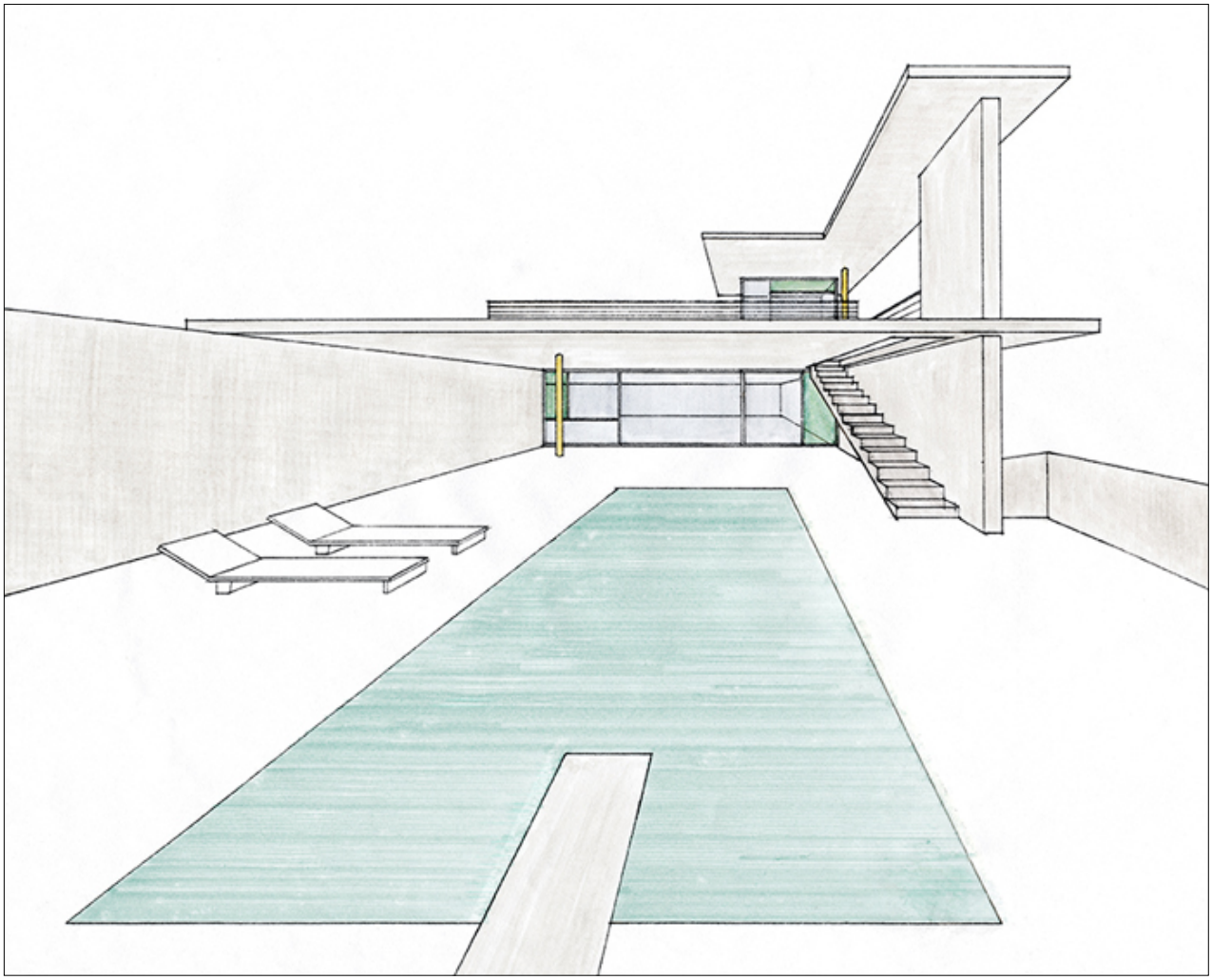
Deep Learning for Mobile Robot Perception



Assignment 6

Deep Learning for Mobile Robot Perception

Artificial Intelligence for Robotics

Dr. Min-Fan Ricky Lee

Deep Learning for Mobile Robot Perception

Submission

1. *Matlab Code*
2. *Video (Experiment and Data)*
3. *Word file (IEEE Conference Template)*

1 Identify Handwritten Digits by Manipulator

Refer to **Lecture Slide**[1, pp. 85-115] by modifying ***MNIST_Classification_Demo_Live.mlx*** with the video input from camera in **Manipulator** at T1-102 Autonomous Robotic Laboratory as shown in Figure 1 and conduct the same experiment and analysis as described in Slide.

Classification target : Various Handwriting

Figure 1. Manipulator. **DoBot**

2 Transfer Learning in Ground Robot

Refer to **Lecture Slide**[1, pp. 116-144] by modifying ***TransferLearningDemo.m*** with the video input from camera in **Ground Robot** at T1-102 Autonomous Robotic Laboratory as shown in **Figure 2** and conduct the same experiment and analysis as described in Slide.

Classification target : Pedestrian, Car, Motorcycle

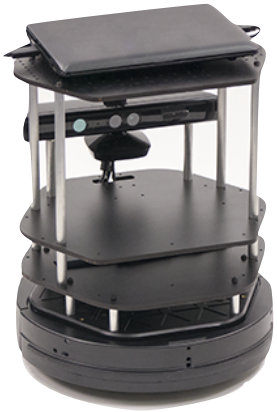


Figure 2. Mobile Robot. **TurtleBot**

Deep Learning for Mobile Robot Perception

3 Semantic Segmentation in Aerial Robot

Refer to **Lecture Slide**[1, pp. 145-196] by modifying ***DeepLearning_For_SemanticSegmentation.mlx*** with the video input from camera in **Aerial Robot** at T1-102 Autonomous Robotic Laboratory as shown in **Figure 3** and conduct the same semantic segmentation experiment and analysis as described in Slide.

Classification target : Tree, Building, Free Space

Figure 3. Mobile Robot. **AR.Drone**

References

1. Min-Fan Ricky Lee,"*Deep Learning I*, " Lecture Slide, Artificial Intelligence for Robotics Lecture, 2020