Sematic Segmentation using Resource Efficient Deep Learning

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Introduction

Semantic segmentation

Divide an input image into different regions which contain a desired object or background.

Left: Input image; Right: Segmentation result.

Applications

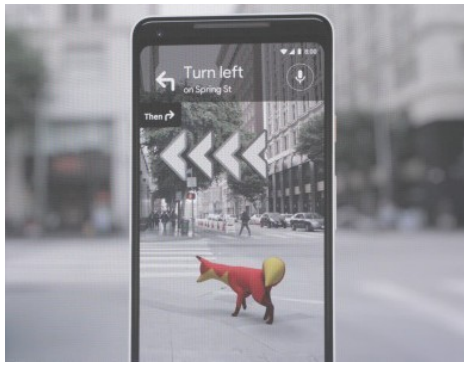
a Autonomous cars

b Robotics

c Augmented reality

(a) Street scene

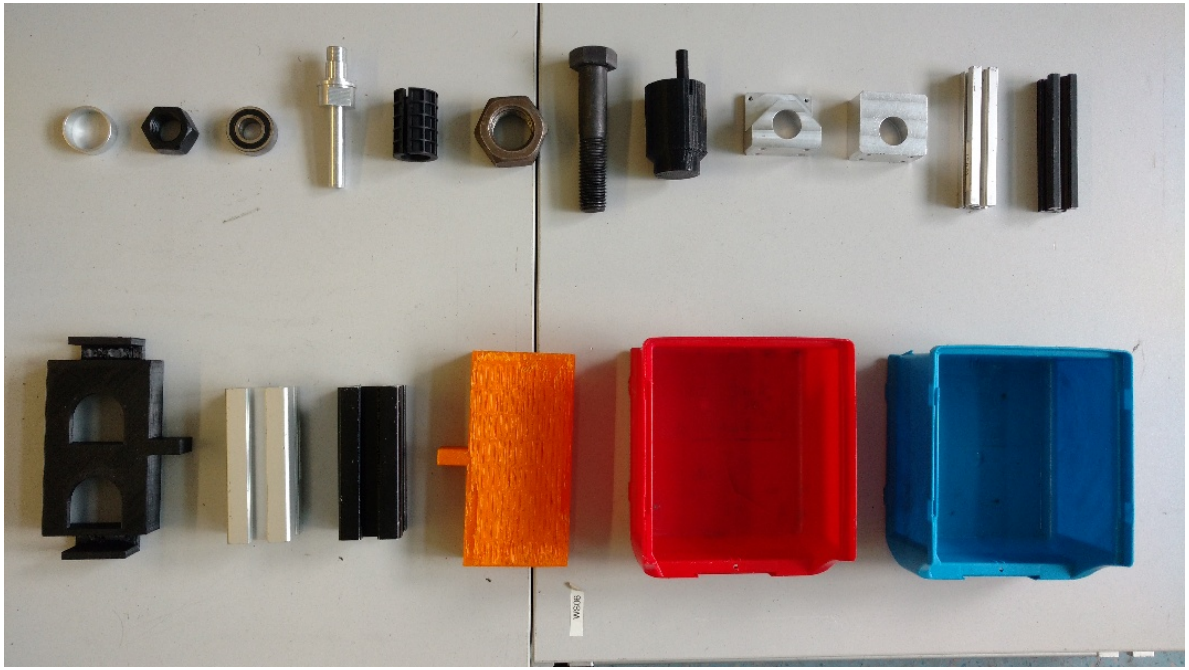
(b) Indoor scene



(c) Augmented guide

Dataset

Objects in the dataset



This figure shows all the 18 objects in the dataset. First row from left: "distance_tube", "m20", "bearing", "axis", "r20", "m30", "m20_100", "motor", "bearing_box_ax16", 'bearing_box_ax01", "f20_20_B", "f20_20_G". Second row from left: "em_01", "s40_40_B", "s40_40_G", "em_02", "container_box_red", "container_box_blue".

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Conclusion and future work

Contributions

- Artificial image generation algorithm.
- Segmentation dataset with 18 atWork objects.
- Evaluation of DeepLabv3+ with resource efficient encoders MobileNetv2 and Xception.

Future work

- Model interpretability.
- Architecture search.
- Fusion of 2D image data with point cloud information.

Thank you very much!

Are there any questions?

References