Introduction

This research aims to develop a Deep Learning based system to process a stream of road-images in order to classify and localize them on a map by estimating their GPS coordinates and their types. Furthermore, we introduce the largest traffic signs repository to support future work on Traffic Signs Recognition (TSR), and serve as a benchmark in this domain.

Methods

Our baseline-system uses a heavily modified version of the state-of-the-art object-detector known as RetinaNet[2], along with a new geospatial-based object tracking unit as described in Figure 2.

Results

Our current dataset covers 176 different types of traffic signs containing more than 51K images and over 27K annotations, which surpasses our top competitor dataset LISA[1] by a huge margin as illustrated in the graphs below:

![Comparison Graph]

Our baseline-system achieved 87% average precision (AP) on 62 different sign-types. More importantly, the system scored an average of (±) 4.69 meters’ geospatial margin of error.

Conclusion

We introduces a new dataset and a DL system for TSR to accurately localize road assets in order to make better assessments and maintenance plans.

Future Work

- Enhancement of object classification and localization.
- Implementation of fully-automated geospatial mapping system.
- Addition of other road assets (i.e. utility poles, trees, traffic lights, etc.)

References