Using Satellite Images Datasets for Road Intersection Detection in Route Planning

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Abstract : Understanding road networks plays an important role in navigation applications such as self-driving vehicles and route planning for individual journeys. Intersections of roads are essential components of road networks. Understanding the features of an intersection, from a simple T-junction to larger multi-road junctions, is critical to decisions such as crossing roads or selecting the safest routes. The identification and profiling of intersections from satellite images is a challenging task. While deep learning approaches offer the state-of-the-art in image classification and detection, the availability of training datasets is a bottleneck in this approach. In this paper, a labelled satellite image dataset for the intersection recognition problem is presented. It consists of 14,692 satellite images of Washington DC, USA. To support other users of the dataset, an automated download and labelling script is provided for dataset replication. The challenges of construction and fine-grained feature labelling of a satellite image dataset is examined, including the issue of how to address features that are spread across multiple images. Finally, the accuracy of the detection of intersections in satellite images is evaluated.