Visual Analysis for Urban Traffic Network with Multiple CCTV Videos

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Summary:

Many previous studies analyze traffic flows utilizing vehicle detector (VD) data and GPS trajectory data. The VD system consists of expensive equipment and high maintenance costs and GPS trajectory data measures travel records only for sampled vehicles. On the contrary, CCTV cameras are located at the major intersections in most urban areas. In this study, we propose a framework for analyzing real-time traffic conditions using multiple CCTV videos and predicting future traffic conditions. The proposed framework recognizes vehicles from CCTV images in real-time and extracts vehicle flow data. After that, the urban traffic network is built by combining the vehicle flow data and the CCTV camera network. Since most CCTV cameras only observe a part of the road at the intersection, some traffic flows may not be monitored. Therefore, we introduce a tree search algorithm and an extended DCRNN model to estimate the vehicle flow on unobserved roads.

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