Active Traffic Monitoring Through Large Scale Processing of Aerial Camera Array Networks

Dataset available at: https://cecas.clemson.edu/C2M2/active-traffic-monitoring-through-large-scale-processing-of-aerial-camera-array-networks-final-report/

(This dataset supports report **Active Traffic Monitoring Through Large Scale Processing of Aerial Camera Array Networks**)

This U.S. Department of Transportation-funded dataset is preserved by the Center for Connected Multimodal Mobility digital repository (https://cecas.clemson.edu/C2M2/) and is available at https://cecas.clemson.edu/C2M2/active-traffic-monitoring-through-large-scale-processing-of-aerial-camera-array-networks-final-report/.

The related final report **Active Traffic Monitoring Through Large Scale Processing of Aerial Camera Array Networks**, is available from the National Transportation Library's Digital Repository at https://rosap.ntl.bts.gov/view/dot/53598.

Metadata from the Center for Connected Multimodal Mobility Repository record:

Description:
This research focuses on automated processing of video from a persistent surveillance camera array to extract traffic data from a 25 square mile area. In previous research, we developed an automated traffic surveillance system capable of processing aerial camera array imagery to extract valid and useful traffic data for diverse applications. In this research, we continue to improve the system's capability by adding a novel multiple hypothesis tracking capabilities to improve vehicle tracking in congested traffic and adding a location identification algorithm to map vehicles throughout a network. Our evaluation has shown that the proposed system is capable of collecting speed, density, and volume data with an acceptable level of accuracy for many applications. The mapping of vehicles for a sample area was also successful. With further research, improved video preprocessing, enhanced resolution, and a higher frame rate, the accuracy of tracking vehicles can be improved significantly which will eventually allow the envisioned system to be able to accurately map the location of all vehicles throughout a camera array image sequence. A digital real-time "traffic map" created by the envisioned system will provide a robust data set where data mining methods could be applied to enhance traffic management and provide data for a variety of traffic studies. A connected vehicle camera array application can open up plenty of possibilities in real-time traffic surveillance where erratic drivers can be identified automatically and warnings or even shut down commands can be sent to the erratic vehicles. The active sensing capability of such a system can potentially prevent some incidents from occurring thereby increasing safety and reducing incident induced traffic congestion.

Keywords:
Traffic Surveillance; Aerial Camera Arrays; Vehicle Tracking; Vehicle Mapping; Computer Vision; Deep Learning

Recommended citation:
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Dataset description:
This dataset is not listed on the Center for Connected Multimodal Mobility. Please contact the dataset owner via the Center for Connected Multimodal Mobility at https://cecas.clemson.edu/C2M2/active-traffic-monitoring-through-large-scale-processing-of-aerial-camera-array-networks-final-report/.

National Transportation Library (NTL) Curation Note:
As this dataset is preserved in a repository outside U.S. DOT control, as allowed by the U.S. DOT's Public Access Plan (https://doi.org/10.21949/1503647) Section 7.4.2 Data, the NTL staff has performed ***NO*** additional curation actions on this dataset.

NTL staff last accessed this dataset at https://cecas.clemson.edu/C2M2/active-traffic-monitoring-through-large-scale-processing-of-aerial-camera-array-networks-final-report/ on 2021-08-10

If, in the future, you have trouble accessing this dataset at the host repository, please email NTLDataCurator@dot.gov describing your problem. NTL staff will do its best to assist you at that time.