Artificial Intelligence and Machine Learning for Smart Transportation

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Abstract

Mitigating traffic congestion and improving safety are the cornerstones of transportation within smart cities. Current practices collect and analyze data from sensors and video processing and then process it offline. Hence, they are limited in proactively reducing traffic fatalities and preventable delays at intersections. We are developing edge based real-time artificial intelligence algorithms and software to analyze video feeds from cameras and fuse them with ground sensor data to develop deep learning based digital twins that mimic traffic behavior both at an intersection and at the city level. We are also using the resultant output to develop technologies that will quantitatively measure and rank intersections by safety, to transmit information about unsafe behavior to connected vehicles and pedestrians in real-time to prevent accidents, and to optimize signal timing to reduce congestion.

Each of these advances are presently being field tested at intersections in the City of Gainesville and in Seminole County. The overall effort is geared toward developing transportation solutions for leading edge 21st century smart cities.