

Urban Street Lighting Infrastructure Monitoring Using a Mobile Sensor Platform

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Abstract— We present a system for collecting and analyzing information on street lighting infrastructure. We develop a car-mounted sensor platform that enables collection and logging of data on street lights during night-time drive-bys. We address several signal processing problems that are key to mapping street illumination levels, identifying street lamps, estimating their heights, and geotagging them. Specifically, we highlight an image recognition algorithm to identify street lamps from the video data collected by the sensor platform and its subsequent use in estimating the heights of street lamps. We also outline a framework to improve vehicle location estimates by combining sensor observations in an extended Kalman filter framework. Our eventual goal is to develop a semi-live virtual 3-D street lighting model at urban scale that enables citizens and decision makers to assess and optimize performance of nighttime street lighting.

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