Team Cornell's Skynet: Robust Perception and Planning in an Urban Environment

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Received 30 January 2008; accepted 16 June 2008

Team Cornell's Skynet is an autonomous Chevrolet Tahoe built to compete in the 2007 DARPA Urban Challenge. Skynet consists of many unique subsystems, including actuation and power distribution designed in-house, a tightly coupled attitude and position estimator, a novel obstacle detection and tracking system, a system for augmenting position estimates with vision-based detection algorithms, a path planner based on physical vehicle constraints and a nonlinear optimization routine, and a state-based reasoning agent for obeying traffic laws. This paper describes these subsystems in detail before discussing the system's overall performance in the National Qualifying Event and the Urban Challenge. Logged data recorded at the National Qualifying Event and the Urban Challenge are presented and used to analyze the system's performance. © 2008 Wiley Periodicals, Inc.

Journal of Field Robotics 25(8), 493–527 (2008) © 2008 Wiley Periodicals, Inc.
Published online in Wiley InterScience (www.interscience.wiley.com). • DOI: 10.1002/rob.20253