UTC Project Information

Project Title	Investigation of AV Operational Issues using Driving Simulator Equipment
University	Purdue University
Principal Investigator	Brandon Pitts and Samuel Labi
PI Contact Information	Nextrans Center, 3000 Kent Avenue, W; Lafayette, IN 47906; 765-637-6038; labi@purdue.edu, bjpitts@purdue.edu
Funding Source(s) and Amounts Provided	CCAT: $75,000 Cost share partner: Nanyang Technological University: $75,000
Total Project Cost	$150,000
Agency ID/ Contract #	69A3551747105
Start and End Dates	January 1, 2019 to December 31, 2020
Brief Abstract of Research Project	Autonomous vehicle (AV) stakeholders continue to seek assurance of the safety performance of this new technology through ways that include AV testing on in-service roads, AV-dedicated road networks and AV test tracks. Driving simulation can be used to test AV scenarios in a safe environment. This project proposes the use of a driving simulator to address specific issues associated with autonomous vehicles. The proposed research addresses five aspects associated with human take over from AV: (1) characterizing the level of risk in the driving environment, as a function of the traffic conditions, roadway design features, road environment conditions, and AV passenger attributes, (2) establishment of take-over warrants, that is, the given combinations of risk factors that will require take over, (3) take-over alerts, specifically, evaluating the efficacy of various alert alternatives: visual, auditory, tactile, and any combination of these, (4) assessing the propensity of an AV operator to take over the vehicle control, as a function of the nature of perceived risk and the prevailing levels of the risk factors (attributes of the driver, vehicle, the road design, and the road environment), (5) measuring and modeling the effective response time, in other words, the time taken for the operator to take over the vehicle (from the time of receipt of the AV's alert to take over or the operator's self-recognition of driving hazard without receiving alert) to the time the operator is in full control.
Most Relevant CCAT Research Thrusts (choose all	_____ Enabling Technology ___X__ Planning and Policy ___X__ Human Factors _____ Infrastructure Design and Management ___X__ Control and Operations ___X__ Models and Implementation
Describe Implementation of Research Outcomes (or why not implemented)	Not yet implemented. Research is in progress.

Impacts/Benefits of Implementation (actual, not	Not yet implemented. Research is in progress.
Web Links • Reports • Project website	ccat.umtri.umich.edu