UTC Project Information	
Project Title	Sensor Degradation Detection Algorithm for Automated Driving Systems
University	
Principal Investigator	Michelle Chaka
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Funding Source(s) and Amounts Provided (by each agency or organization)	Federal: 45,000 Match Sources (CCI,GCAPS, ODU): $354,999
Total Project Cost	$400,000
Agency ID or Contract Number	Grant No: 69A3551747115 Project: VTTI-00-036
Start and End Dates	04/01/21 to 12/31/21
Brief Description of Research Project	The project will develop a sensor degradation detection algorithm for Automated Driving Systems (ADS). Sources of sensor degradation include weather, cyberattacks, and sensor malfunction. Incorrect information from a sensor could result in significant safety issues. Naturalistic Driving Data (NDD) related to sensor perception will be selected to establish baseline performance and determine metrics. Sensor models for lidar, radar, and GPS will be developed to characterize the sensor performance based on physical testing. A virtual framework for simulation will be used to integrate sensor models, vehicle models, event replication, vehicle control algorithms, and sensor fusion algorithms. This framework will allow the team to investigate the development and assessment of sensor degradation detection algorithms to recognize possible misinformation of the sensor.
Describe Implementation of Research Outcomes (or why not implemented) Place Any Photos Here	This project will provide foundational work to advance state-of-the-art algorithm to improve the performance of ADS-equipped vehicles and degraded sensor modeling techniques and a virtual framework. The work planned is novel and methods and approaches are still evolving. The learnings and findings from this work with be shared through a webinar, technical report, and research team will look for conference opportunities. The data from the sensor testing will be made available to allow others to develop sensor models based on this work for additional study and research.

Impacts/Benefits of Implementation (actual, not anticipated)	The findings from this project will help advance sensor models, especially with degraded states and the research needed to develop sensor detection algorithms. The detection algorithm has paths to commercialization for implementation into manufactures products, use in 3rd party evaluations, or to guide research for determining regulations relative to ADS performance specifications and component specifications.

Web Links
    • Reports
    • Project website
	https://safed.vtti.vt.edu/projects/sensor-degradation-detection-algorithm-for-automated-driving-systems/