CENTER FOR CONNECTED AND AUTOMATED TRANSPORTATION

UTC Project Information	
Project Title	Accelerated Training for Connected and Automated Vehicles Based on Adaptive Evaluation Method
University	University of Michigan
Principal Investigator	Henry Liu
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Funding Source(s) and Amounts Provided (by each agency or organization)	$149,860 (CCAT)
Total Project Cost	$149,860
Agency ID or Contract Number	69A3551747105
Start and End Dates	04/01/2019 – 03/31/2020
Brief Abstract of Research Project	This project focuses on resolving the inefficiency problem caused by the long-tail phenomena in the development of connected and automated vehicles (CAVs) to accelerate the training process. The training of CAV model can be divided into two stage: in the first stage, the model is trained with naturalistic driving data, while in the second stage, when the training efficiency is greatly compromised by the long-tail phenomena, a reinforcement learning based mechanism with critical scenarios is proposed. The critical scenarios, which contain vulnerabilities of the CAV model, can be generated by the adaptive evaluation method. An incremental learning mechanism is designed and a discount factor will be introduced according to the probability of the critical scenarios. Importance sampling technologies will be applied to guarantee the accuracy of the discount factor. Meanwhile, a training and testing platform will be designed and built to validate the proposed accelerated training framework.
Most Relevant CCAT Research Thrusts	Enabling Technology Control and Operations Models and Implementation

Describe Implementation of Research Outcomes (or why not implemented) Place Any Photos Here	
Impacts/Benefits of Implementation (actual, not anticipated)	
Web Links • Reports • Project website	ccat.umtri.umich.edu