



Center for Advanced Multimodal Mobility Solutions and Education

UTC Project Information – CAMMSE @ UNC Charlotte	
Project Title	Real-Time Freeway Speed Prediction Based on Deep Learning in Connected And Autonomous Vehicles Environment
University	The University of North Carolina at Charlotte
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Funding Sources and Amount Provided (by each agency or organization)	U.S. Department of Transportation: \$60,000 The University of North Carolina at Charlotte: \$30,006
Total Project Cost	\$90,006
Agency ID or Contract Number	
Start and End Dates	10/01/2021 – 09/30/2022
Brief Description of Research Project	<p>In the last few years, there has been a significant increase in the research of the connected autonomous vehicles (CAV) across the globe, perhaps due to an exponential increase in the popularity and usage of the artificial intelligence techniques in various applications. CAVs can greatly help traffic engineers manage the flow and mitigate traffic congestion on road networks by using the cooperative adaptive cruise control (CACC).</p> <p>For CAV to act more efficiently and improve mobility as well as alleviate traffic congestion, timely prediction of traffic flow is undoubtedly a critical component. A comprehensive review of the</p>



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	<p>existing literature clearly suggests that research on CAVs has shifted from traditional optimization and statistical models to adaptive machine learning techniques. However, existing machine learning models may not be easily developed and directly applicable in this environment due to non-linear complex relationship between spatial and temporal data collected from the surroundings during the aforementioned adaptive decisions taken by the vehicles.</p> <p>In this project, we will develop a traffic prediction framework based on various deep learning models for CAVs and compared these models with respect to their applicability in modern smart transportation systems. This research will also establish the simulation environment for CAVs in mixed traffic scenarios with different market penetration rates of CAVs. The results of this study can greatly help traffic engineers and stakeholders better understand how CAV affect traffic flow and therefore improve its management and control.</p>
<p><i>Describe Implementation of Research Outcomes (or why not implemented)</i></p> <p><i>Place Any Photos Here</i></p>	
<p><i>Impacts/Benefits of Implementation (actual,</i></p>	



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<i>not anticipated)</i>	
Web Links <ul style="list-style-type: none">• <i>Reports</i>• <i>Project website</i>	https://cammse.uncc.edu/sites/cammse.uncc.edu/files/media/CAMMSE-UNCC-2022-UTC-Project-Information-02-Fan.pdf https://cammse.uncc.edu/sites/cammse.uncc.edu/files/media/CAMMSE-UNCC-2022-UTC-Project-Report-02-Fan-Final.pdf