

UTC Project Information	
Project Title	Data-Driven Motion Control of Autonomous Vehicles in GPS-Unreliable Environments
University	University of Alaska
Principal Investigator	Chuan Hu
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Funding Source(s) and Amounts Provided (by each agency or organization)	University of Washington PacTrans \$50,000 University of Alaska \$ 50,000
Total Project Cost	\$100,000
Agency ID or Contract Number	69A3551747110
Start and End Dates	May 16, 2022-May 15, 2023
Brief Description of Research Project	<p>In this project, a novel data-driven strategy will be proposed for AV motion control when a GPS signal is not reliable. In recent years, data-driven approaches such as reinforcement learning (RL) and adaptive dynamic programming (ADP) algorithms have been widely adopted in solving dynamic programming problems. However, there is seldomly any related application in AV control systems when a GPS signal is not reliable, where technical difficulties occur due to the unavailability of the vehicle location, orientation and certain critical vehicle states.</p> <p>An AV's complex operation environment, external disturbances, system nonlinearities, modeling and non-structural uncertainties also lead to challenges for reliable motion control.</p> <p>To this end, this project will develop an enhanced ADP approach for AV motion control when the GPS signal is not reliable, based on the estimation results for the sideslip angle and tire-road friction coefficient. The dependable inputs will be signals collected/measured from on-board sensing results.</p>

<p>Describe Implementation of Research Outcomes (or why not implemented)</p> <p>Place Any Photos Here</p>	
<p>Impacts/Benefits of Implementation (actual, or anticipated)</p>	
<p>Web Links</p> <ul style="list-style-type: none">• Reports• Project Website	