

# 2022 Intel Cup Undergraduate Electronic Design Contest – Embedded System Design Invitational Contest

## Project Introduction

<b>University</b>	Arizona Ste University		
<b>Faculty Mentor</b>	Gennaro De Luca and Yinong Chen		
<b>Team Member</b>	Chengxu Liang,	Drew Mudry	Gyllian Gaylor
<b>Subject</b>	Traffic Simulation with Dynamic and Machine Learning Routing Prediction		
<p style="text-align: center;"><b>Brief Introduction</b> (Within 250 words)</p>	<p>This project develops a traffic simulator that allows students to use a visual programming language to program a car to navigate through the traffic to travel from point A to point B. The visual programming language used is the ASU VIPLE (Visual IoT/Robotics Programming Language Environment). The traffic simulator is developed using Microsoft Unity game engine. The traffic is generated through mapping New York’s Manhattan traffic dataset into our traffic simulator to create realistic traffic pattern. Three algorithms are implemented to test the traversing algorithm effectiveness: (1) Simple Static Dijkstra’s Algorithm using road section length as graph weights; (2) Dynamic Dijkstra’s Algorithm that takes dynamic traffic into consideration and recalculates the shortest path at every intersection; (3) Machine-Learning based Dijkstra’s Algorithm that predicts the best route based on the past traffic dataset training. Both VIPLE and Unity traffic simulator are performance demanding. We use Intel GNS-V40 processor board to run both VIPLE and simulator to prove the GNS-V40 performance. We also run physical robot as the “avatar” of the simulated robot to show the program card moving outside the simulation into physical space. The experiment show that GNS-V40 processor has adequate performance to detail with all these complex tasks simultaneously.</p>		

1. Please fill the blanks with Times New Roman font, size 12, and single-spaced.
2. There should be only one faculty mentor.
3. Faculty mentor and team members should be the same as that on the registration form.
4. Subject should be the same as that on the final report.