**2019 UVA DSI Capstone Program Raytheon Proposal  
Raytheon Business Contact:** Kent Pride (Kent\_Pride@raytheon.com)  
**Raytheon Project Mentors:** Alfonso Lopez (Alfonso.A.Lopez@raytheon.com),   
 Jay Farmer (Jay\_Farmer@raytheon.com)

**Problem Description:**

Raytheon provides highly advanced and reliable All Electronic Tolling (AET) systems. As an industry leader, we bring two decades of expertise delivering turn-key open-road tolling solutions that seamlessly integrate with tolling and traffic management systems. Through continuous innovation, developing and implementing new capabilities including the dynamically priced AETS, Raytheon is a market leader in highway tolling technology.

Advancements in low cost sensors and image processing technologies provide a path for the creation of new and innovative machine learning solutions to help advance the AET space. Students will work with the Raytheon mentors and UVA faculty advisors to integrate machine learning into the AET system.

**Main Objectives:**

* Work with Raytheon mentors to refine project scope, schedule and deliveries
* Design scalable architecture for the solution which is expandable for future use
* Ingest roadside video data
* Create trainable machine learning modules to support detection and classification of objects
* Test machine learning modules on prototype hardware
* Use student’s creativity and innovation to create new capabilities and insights
* Provide functional working prototype and all required documentation (proposal, architecture & design, set up, etc.)

**Data and Methodology:**

Raytheon will provide students access to video files. Students will use open source software libraries such as TensorFlow and Nvidia Modules to accelerate their proof of concept. Processing will be primarily performed at the sensor itself via an Nvidia Jepson TX2 developer kit.

Students should be:

* Excited to diligently learn new technologies for project development and integration
* Willing to explore the unknown, take risks, and create new hardware/software solutions
* Exercise deliberate communication and work well in a team

Meetings will be held weekly with corporate mentors and faculty advisors.   
  
**Student Restrictions:**

* U.S. Citizens preferred
* *Results are to be proprietary–all public presentations and documents must be reviewed prior to distribution. Students will sign NDA/IP Agreement*