



## ***FLIR – Application of Neural Networks with ADAS dataset***

This project is in cooperation and partnership with FLIR Systems located in Goleta. FLIR Project Lead – Louis Tremblay

FLIR Systems, Inc. is the global leader in Infrared cameras, night vision, and thermal imaging systems. Our products play pivotal roles in a wide range of industrial, commercial, and government activities in more than 60 countries. Pioneers in the commercial infrared camera industry, the Company has been supplying thermography and night vision equipment to science, industry, law enforcement and the military for over 30 years. From predictive maintenance, condition monitoring, non-destructive testing, R&D, medical science, temperature measurement and thermal testing to law enforcement, surveillance, security and manufacturing process control, FLIR offers the widest selection of infrared cameras for beginners to pros.

### **Project Description**

#### **Statement of the Problem:**

Safety is a paramount requirement to the future of smart vehicles, as recently exemplified by the Uber accident. From self driving cars, taxis, and trucks, a suite of sensors is required for the best possible safety. The FLIR thermal sensors can detect and classify pedestrians, bicyclists, animals and vehicles in challenging conditions including total darkness, fog, smoke, inclement weather and glare, providing a supplemental dataset beyond LiDAR, radar and visible cameras. The detection range is four times farther than typical headlights.



While algorithms have made a lot of progress in the visible world, very little work has been done in the thermal.

#### **Solution Concept:**

Students to use the recently released FLIR RGB/thermal dataset in novel ways. Either developing their own detection algorithm, showing improvements on existing ones, or developing novel ways to cross use visible and thermal data. Overall this is an open-ended project. A stretch goal would be the port of their algorithm into an embedded platform such as a NVIDIA TX2.

Dataset Link: <https://www.flir.com/oem/adas/adas-dataset-form/>

Ideal Student Qualifications:

- Interest and skills in vision systems and image processing
- Algorithm development with emphasis on video systems.
- Strong programming skills.

Student Requirements: Team participants will be required to:

- Sign non-disclosure forms with FLIR to limit outside disclosure of certain proprietary information relating to neural network development
- Sign agreements that provide FLIR with access to any intellectual property developed during the project

Assets Provided by the Company:

- Image dataset, and potentially additional resources
- Access to systems engineering/computer science expertise as required

Company Website: [www.FLIR.com](http://www.FLIR.com)