

FLIR – Enhanced Thermal Imaging

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

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:

FLIR's Boson thermal camera, pictured below, is the newest longwave infrared (LWIR) camera core from FLIR. The Boson is integrated in a variety of products and applications, including handheld scopes for hunters and police officers, Security/Surveillance systems, and UAV payloads. However, due to the inherent nature of LWIR sensitive pixels, the sensor resolution will always be limited compared to visible sensors. The goal of this project is to develop a machine vision implementation for providing enhanced resolution of still images.



Solution Concept:

The Boson is configured to collect video at a rate of 30 frames / second. For scenes that do not vary quickly with time, video analytics / image processing algorithms can be used to take video data collected over a short period of time and construct a high resolution still image using aggregate data from all of the frames. The first goal of this project is to implement these algorithms and apply them to data from the Boson camera.

The second goal of the project is to port the algorithms on the processor of the Boson camera so that the resulting high resolution images can be constructed and viewed in real time. To achieve this goal, the team will be provided with a module consisting of a Boson camera powered by a Movidius multi-vector-processor CPU. The Movidius device is a newly released powerful and very compact processor ideally suited for integrating video analytics and deep learning algorithms.

Ideal Student Qualifications:

- Interest and skills in vision systems and image processing – students selecting this project must enroll in ECE 178 in the Fall.
- Algorithm development with emphasis on video systems.
- Strong programming skills.
- Embedded software.

Student Requirements: Team participants will be required to;

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

Assets Provided by the Company:

- Boson camera module including Movidius CPU
- Access to electrical and systems engineering expertise as required

Company Website: www.FLIR.com