Andrew Zysk 9/11/2016

Senior Design Project Summary

Project Overview

The purpose of this Senior Design Project is to create an image processing software application for crime scene investigation. The intended user, a forensic scientist, would use the application to upload images of crime scene evidence (e.g. blood stains, debris) and automate the forensic process of bloodstain pattern analysis. Modules of the project are defined as terms in the following list:

- A ***mobile application*** for iOS and Android, where the user may upload images from a smartphone camera.
- Software ***infrastructure*** that provides back-end Java code to analyze an image, and transfer data from the web application to a database.
- An ***algorithm*** that outputs an analysis of the image from the input requests of the user, or automatically when no input is provided.

Intellectual Merit

This Senior Design Project will gain most of its intellectual value from the image processing algorithm to be devised. Technical challenges will be faced at each defined project module. Developing an effective algorithm will require technical hurdles, as the algorithm must recognize the physical components (e.g. walls, surfaces) of a crime scene in addition to analyzing it. The primary goal of R&D, which is crucial to the innovation of the project, is the effectiveness, usefulness, and accuracy of the algorithm. The high-level plan for R&D is to research effective methods for computer image processing, and to research established forensic image analysis processes that can be automated. Development of the mobile application and infrastructure will require technical knowledge in iOS and Android development, and cross-platform development.

Broader Impact

This Senior Design Project will yield a useful, automated solution for forensic scientists and other crime scene investigators. Therefore, the proposed application will have potential for commercialization. The proposed application can be used as a tool to compare against forensic results, or it can be used as an unbiased, unambiguous third party in a case analysis. An algorithmic image processing solution will allow crime scene investigators to pursue a deeper analysis of their cases, and it will consequently increase the probability that a case analysis of a crime scene verifies the unequivocal truth. To that end, the innovation and commercialization of the project will provide a net benefit to society.