Engineering and Applied Science
UNIVERSITY OF COLORADO DENVER | ANSCHUTZ MEDICAL CAMPUS

Registration Form

TEAM INFORMATION

Team Name/Project Title: The Clever Cane

Department: Electrical Engineering

Faculty Advisor: Brian Atkinson

Team Members: Alex Grand, Kathryn Falkenstine, Robert Dunn, Huong Nguyen

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PROJECT INFORMATION

Description:

An embedded systems application using computer vision, neural networks and peripheral sensors to assist the visually impaired in traffic environments.

Abstract:

The Clever Cane is an application of embedded systems purposed to assist the visually impaired navigate urban environments and traffic intersections. The goal of this project was to deliver a cheaper and more robust option for "smart canes" in the current market. The device is lightweight and adheres to sizing standards for visual assistance canes. Computer vision techniques are combined with a trained neural network and Google's Tensorflow framework to perform object detection on traffic lights and signage. This is then analyzed to help assess the safety of the intersection. A sonar peripheral sensor is also used to scan for head height obstacles for better object avoidance. Feedback is performed by audio information through a standard 3.5mm audio jack while audio is generated by a text to speech engine. The device is powered by a rechargeable, USB compatible power pack with a lifespan over three hours.