Team: Innovatelol
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Purpose:
Nowadays, newly emerged technologies such as machine learning and image processing have made our lives much more convenient. When we use Microsoft OneNote to convert printed words into digital text, we are enjoying the benefits of AI. However, this field of advancement has little found itself among a special group of people: the visually impaired. Visually challenged individuals are in great need of a product that helps them “see” and find household items in their daily lives. Consequently, our team came up with the idea of developing a household item recognition system in identifying small or medium-sized domestic items. Such an idea is realized by our AI product “AI-eye”.

Function:
AI-eye is a small camera-like machine that can be directly attached to a pair of glasses. It can detect and recognize a household item in a captured image. To use the product, users need to first turn on our system and hold an object in front of the camera. The model recognizes the object and announces the results back to the user. The system will consist of both object detection and classification.

Impact
Today, an estimation of 1.5 Million Canadians identify themselves as having a sight loss. Most of them have adopted different ways of recognizing household items, including seeing by touching, labeling the commonly-used items with different identifiers, replacing all regular household items with braille specific and using mobile phone apps that have object recognition functions. However, these methods are found to be either dangerous or ineffective. In comparison, AI-eye is light and can be directly attached to glasses. More importantly, it is easily accessible and requires little to no effort. As a result, this product is very likely to positively benefit a large number of people that are visually impaired.

Technical aspects
- Image segmentation with OpenCV and SmartCrop
- Use the Continual Object Recognition (CORe50) dataset as a model training dataset
- Implement a model consisted of Capsule Net and Convolutional Neural Network
- The model has a testing accuracy of 85%, meaning that among the 100 household items it detects, it can successfully recognize 85 of them.

Marketing Approach
To make the launch of AI-eye successful, we will first seek partnerships with eye clinics and doctors’ offices to perform alpha and beta testing. With the feedback we gain from these testings, we will be targeting people who are visually impaired and are unsatisfied with the performance of the current devices they have, for example eyeglasses. We will not be targeting people who have both vision loss and hearing loss because at the current stage AI-eye requires audio to announce the detection result to its user. Our main competitor in the industry is going to be companies that offer the same or similar product and targeting the same market segment. Orcam is one of our competitors. It has a product, Orcam MyEye, which specifically targets blind people and is designed to help them identify objects and even read from books and screens. To make our product superior than Orcam’s, our team has decided to keep focusing on research and development of this product and improve the accuracy of the detection.