Horus: Intelligent Home Package Security

Desmond Chan, Hikaru Kasai, Jay Patel, Kevin Young
Advisor: Professor Bagherzadeh
Department of Electrical Engineering and Computer Science

Problem

31%[1] of home parcels are reported stolen in the US

Home owners need to be notified of **possible theft** or suspicious activity

Delivered packages need to be monitored with **smarter security** systems

1. Source: The 2017 Package Theft Report: Porch Pirates, Purchase Habits, and Privacy., Shorr Packaging Corporation
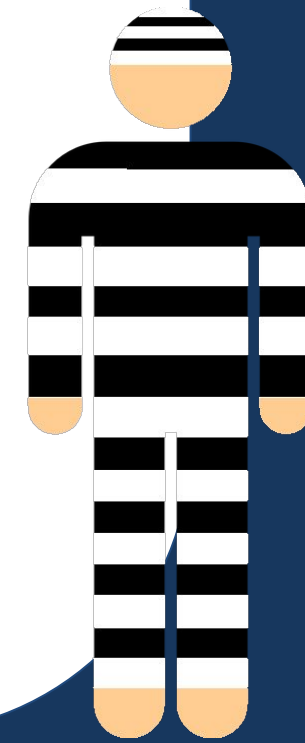
How It Works

1. Horus monitors the front porch and processes captured video streams
2. OpenCV, PyTorch, YOLO v3, and AWS are used as the core frameworks to analyze objects and people
3. The software detects when packages are delivered, picked up by a person, or if there are suspicious people around the package
4. The home owner is notified in real time for activity
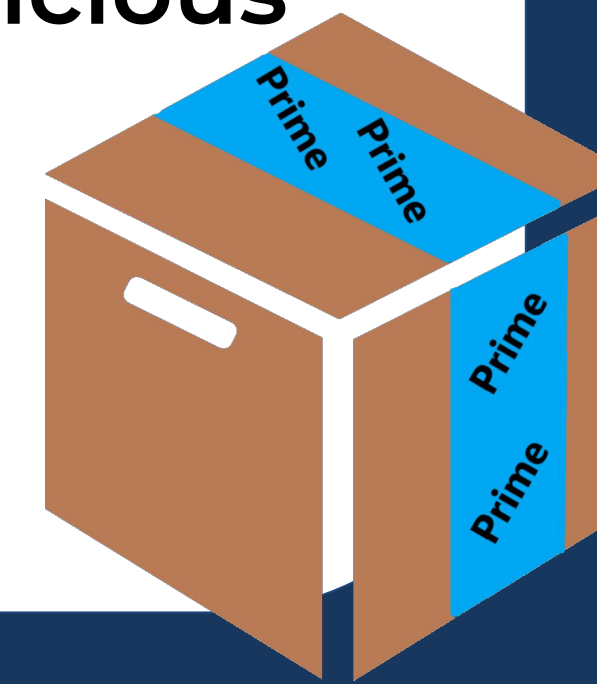
Progress

Weeks 1-2
Brainstorm project idea and research background
Weeks 3-4
Finalized project proposal and researched machine learning
Weeks 5-6
Learned image recognition, machine learning, and and OpenCV
Weeks 7-8
Learn YOLO image recognition libraries and integrate with OpenCV
Weeks 9-10
Build software code to train image recognition using YOLO, OpenCV, PyTorch, and AWS
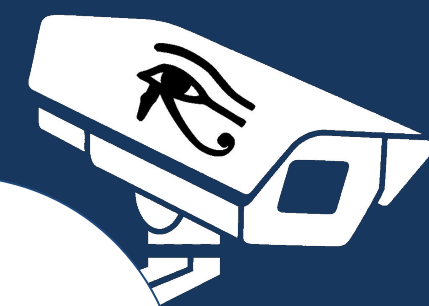**159B**
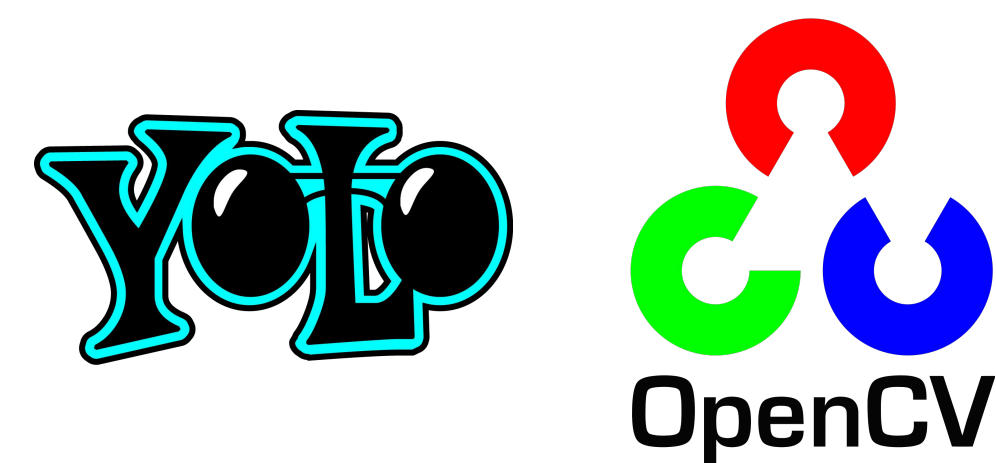Build custom computing unit. Complete notification system. Expand image recognition code..

Solution

Horus uses image recognition and machine learning to detect package arrivals, people and suspicious activities.
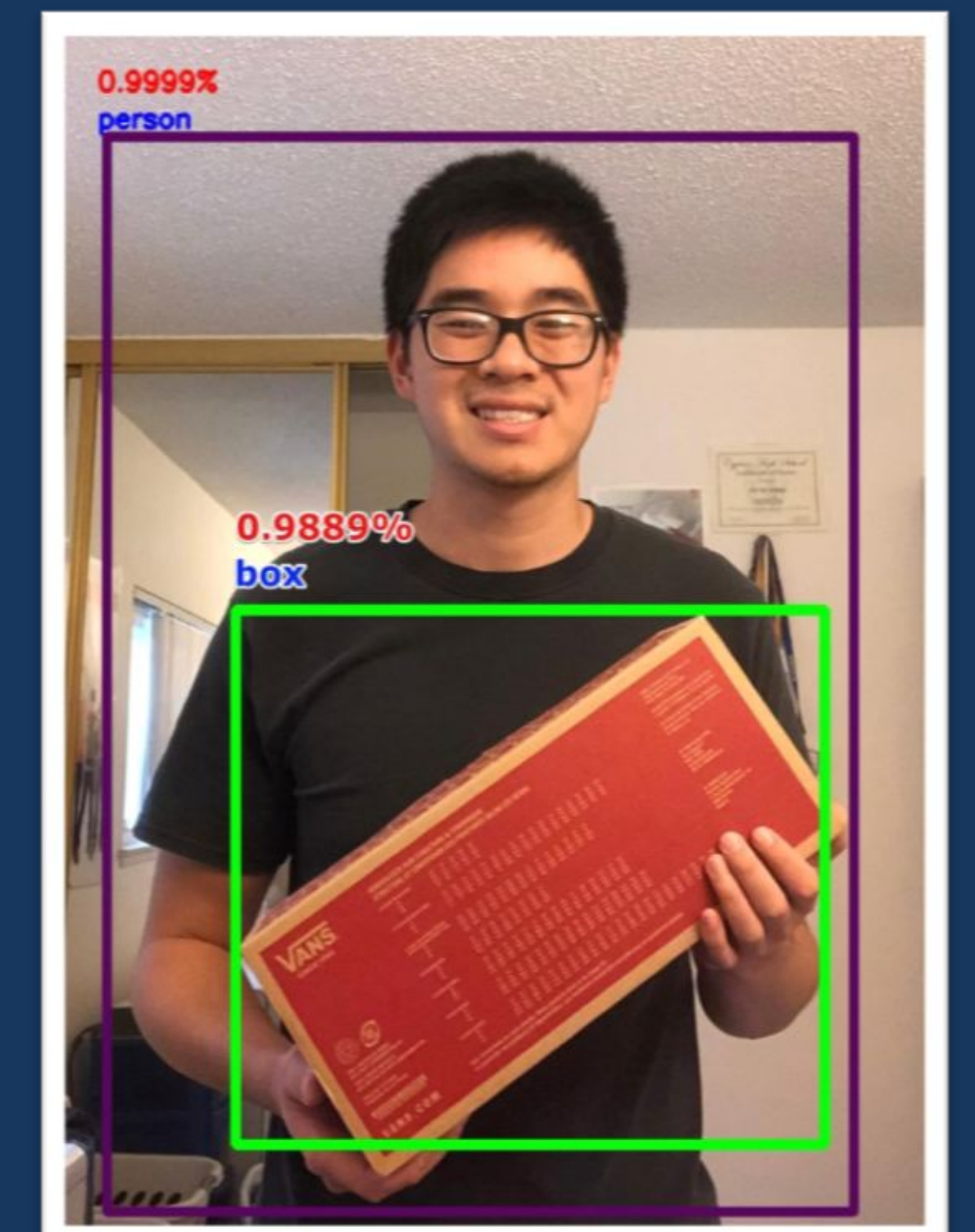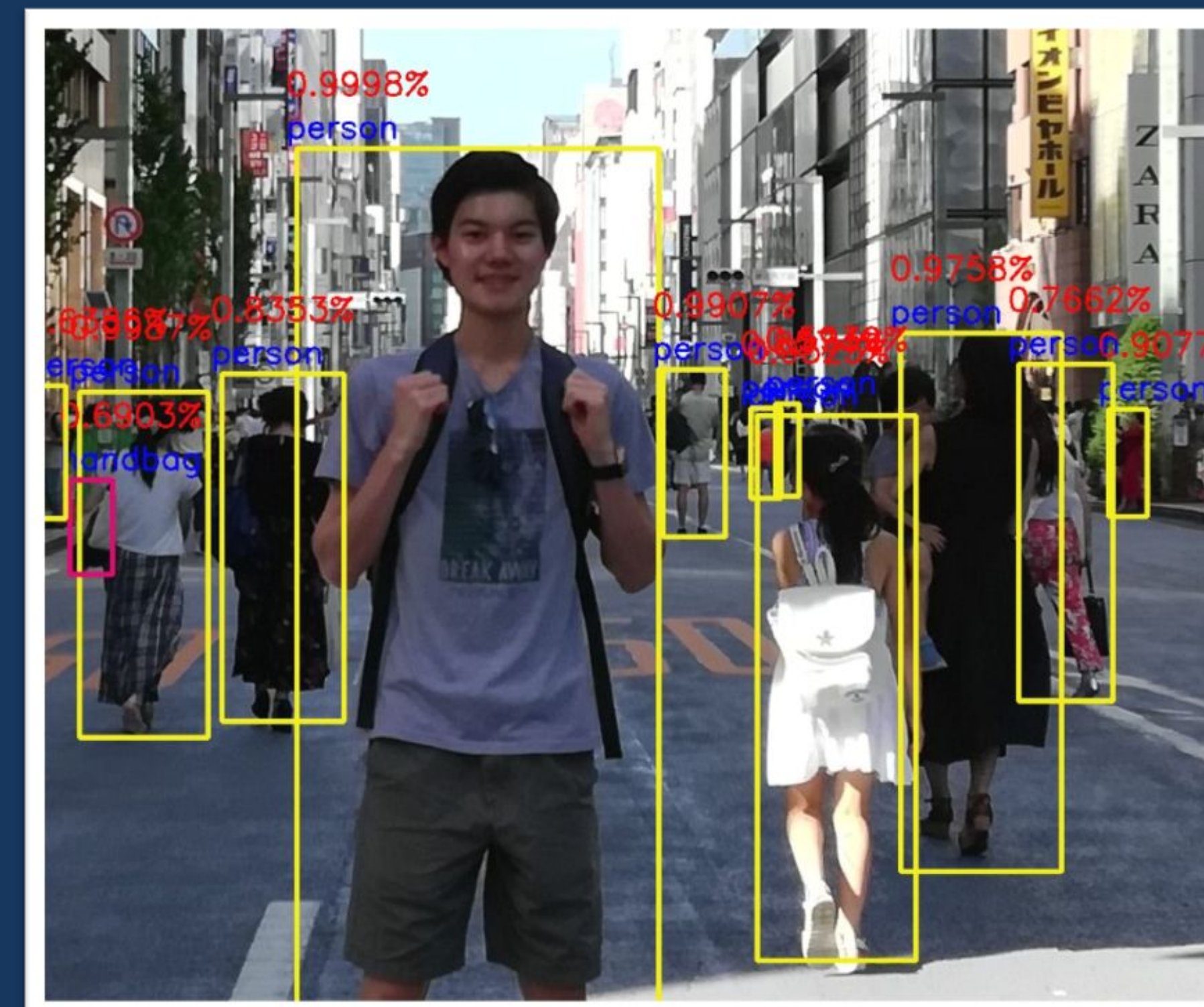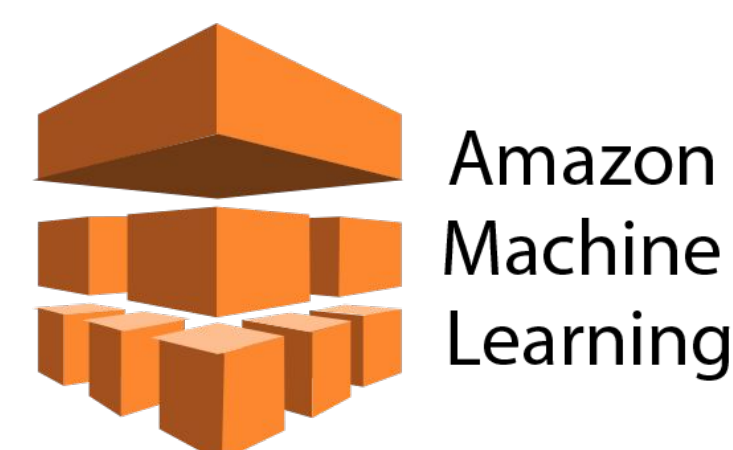
It learns from collected image data to improve detection capabilities.

Framework

YOLO
OpenCV
PYTORCH
Amazon Machine Learning

The samples output labeled people and packages along with the confidence levels.