PROJECTS PORTFOLIO

The portfolio is included individual projects which have been done in free time as a freelancer, researching interesting topics or trying new technology.

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Contains

1. Virtual-fence for safety measurement
2. Person detection/counting
3. Vehicle tracking
4. ORC and color classification
5. Shrimp box counting system
6. Bottle cap detection and orientation analysis
7. Steel defect detection and segmentation
8. Tooth segmentation (XRAY data)
9. Coin classification

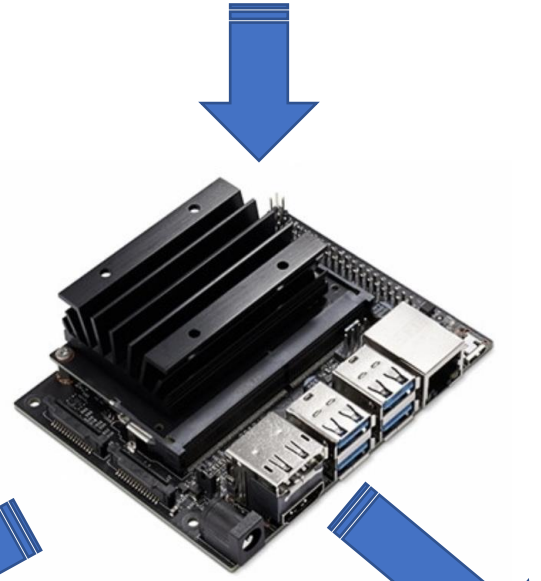
1. Virtual-fence for safety measurement

About

- A virtual fence that will alarm if the operator uses hand during the machine is running.
- Project was deployed on Jetson Xavier AGX

Camera

RTSP/USB camera



Jetson Nano/Xavier

Hand detection and alarm if cross virtual fence

TCPIP

TCPIP to PLC to trigger alarm

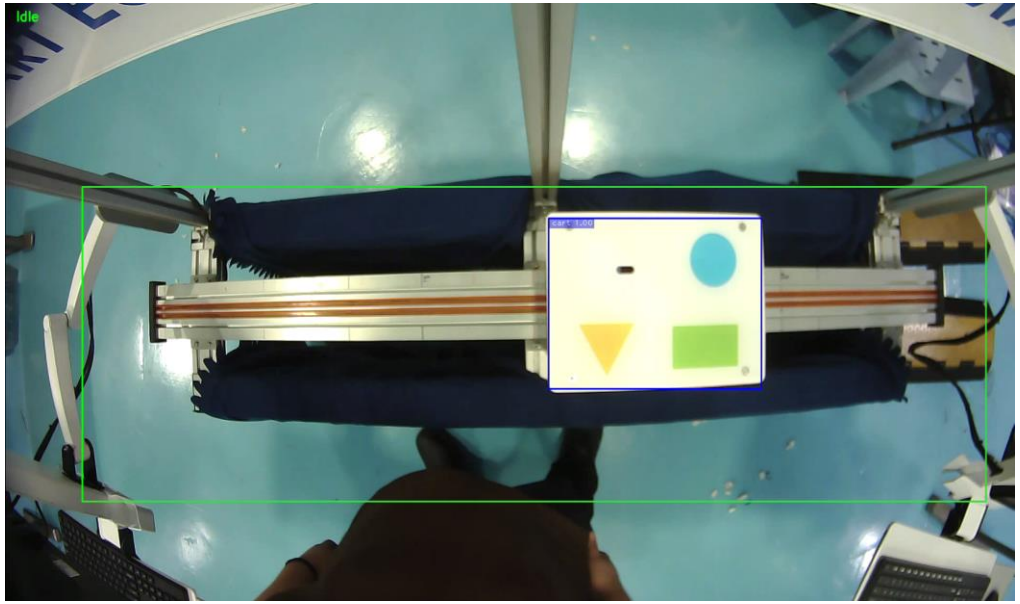
I/O

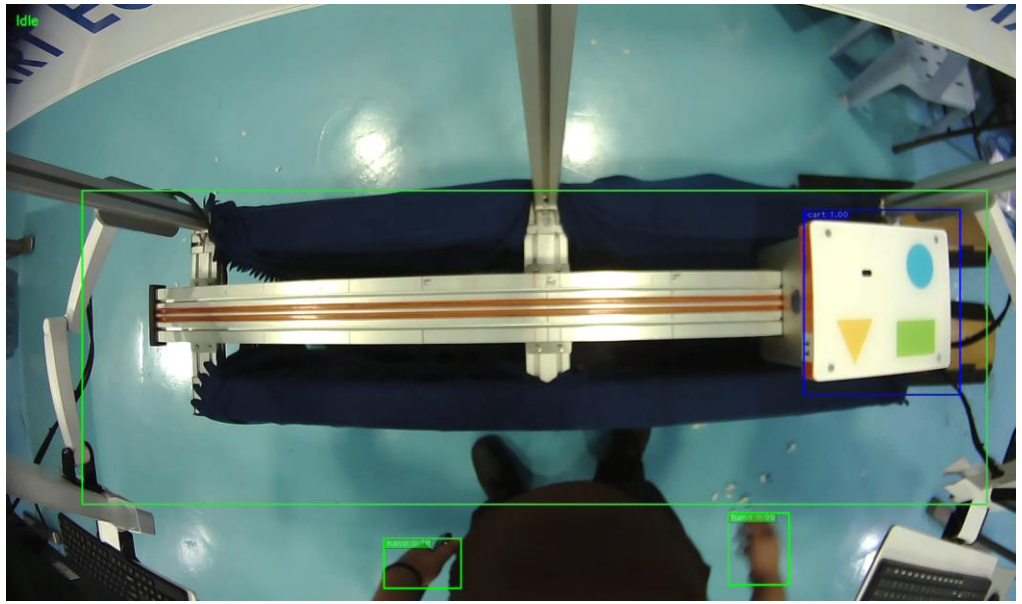
Trigger I/O pin to control hardware

1. Virtual Fence for safety measurement

Idle status

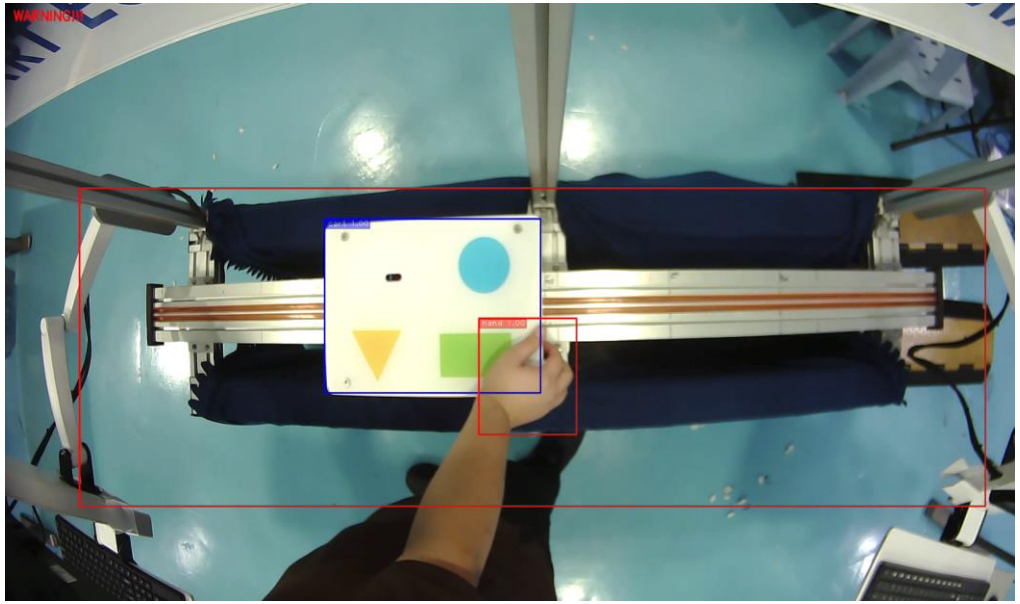
No hand cross virtual fence

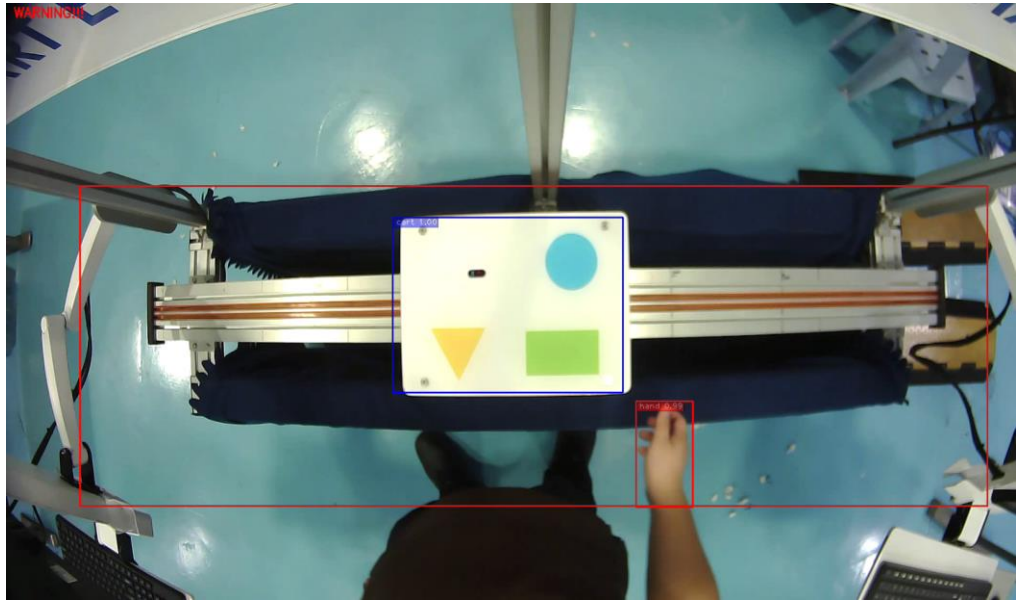




Warning status

Hand(s) cross virtual fence





2.1 Person Detection/Counting (ver. Jetson)

CCTV

CCTV stream over network

Stream (RTSP)

NVIDIA Jetson Nano

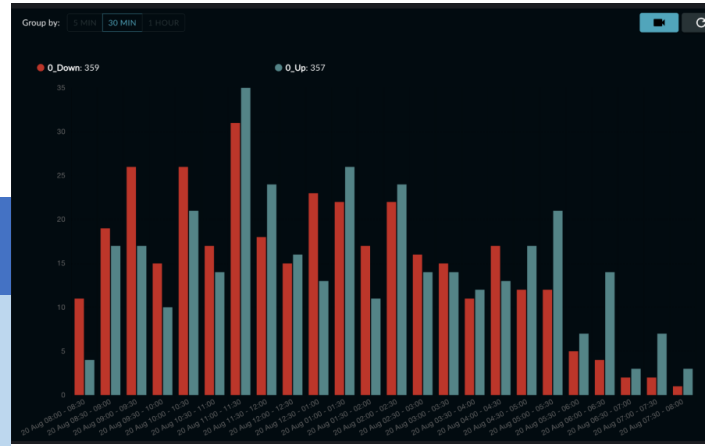
Running object detection to detect people in video

Web database

Store detect and counting result

Website

Show result in real-time



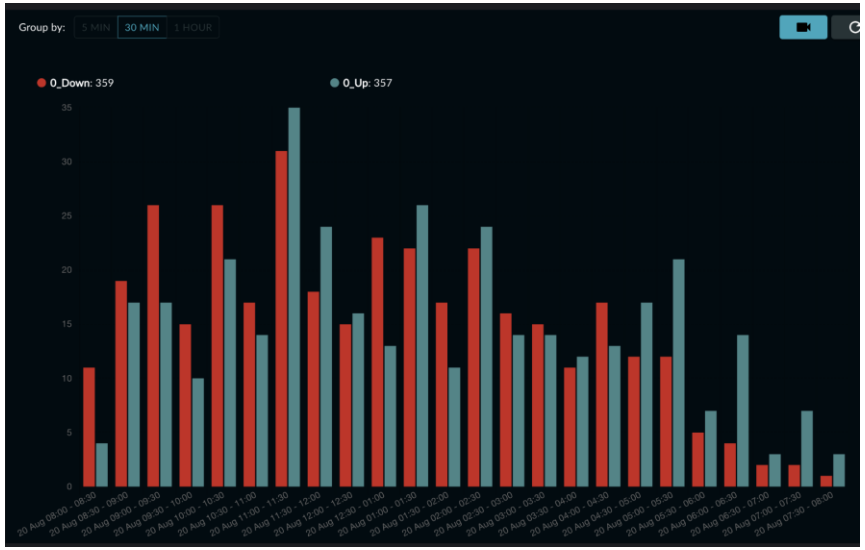
2.2 Person Detection/Counting (ver. AWS)

CCTV

CCTV stream over network

Amazon cloud

Run object detection model which stream from multiple CCTVs



Website

Show result in real-time

2.2 Person Tracking

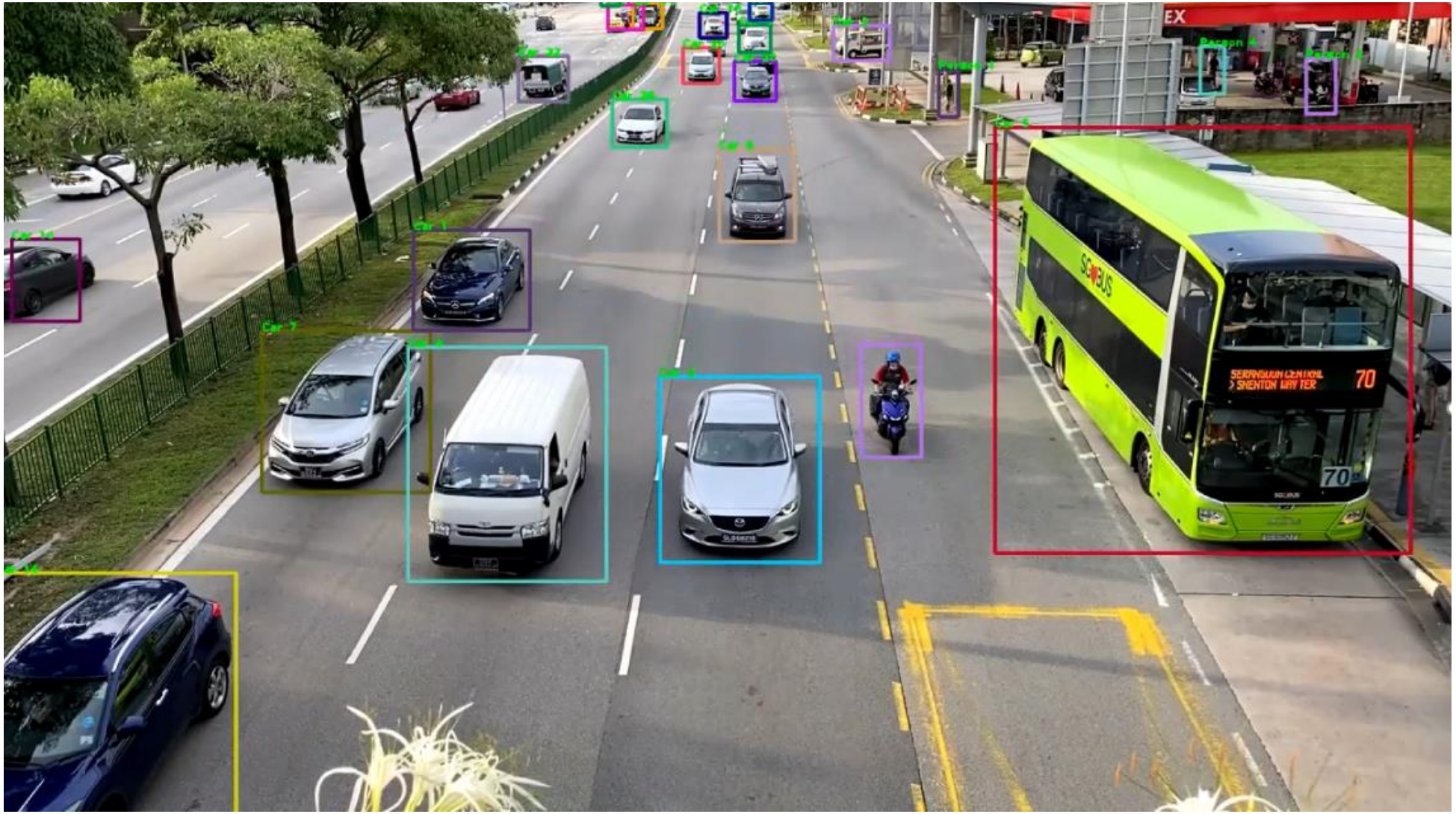
Pedestrian tracking

From person detection, using algorithm to track pedestrian

3. Vehicle Tracking

Vehicle tracking

Another application using object detection, detect vehicle, counting and tracking



4. OCR and Color Classification

About

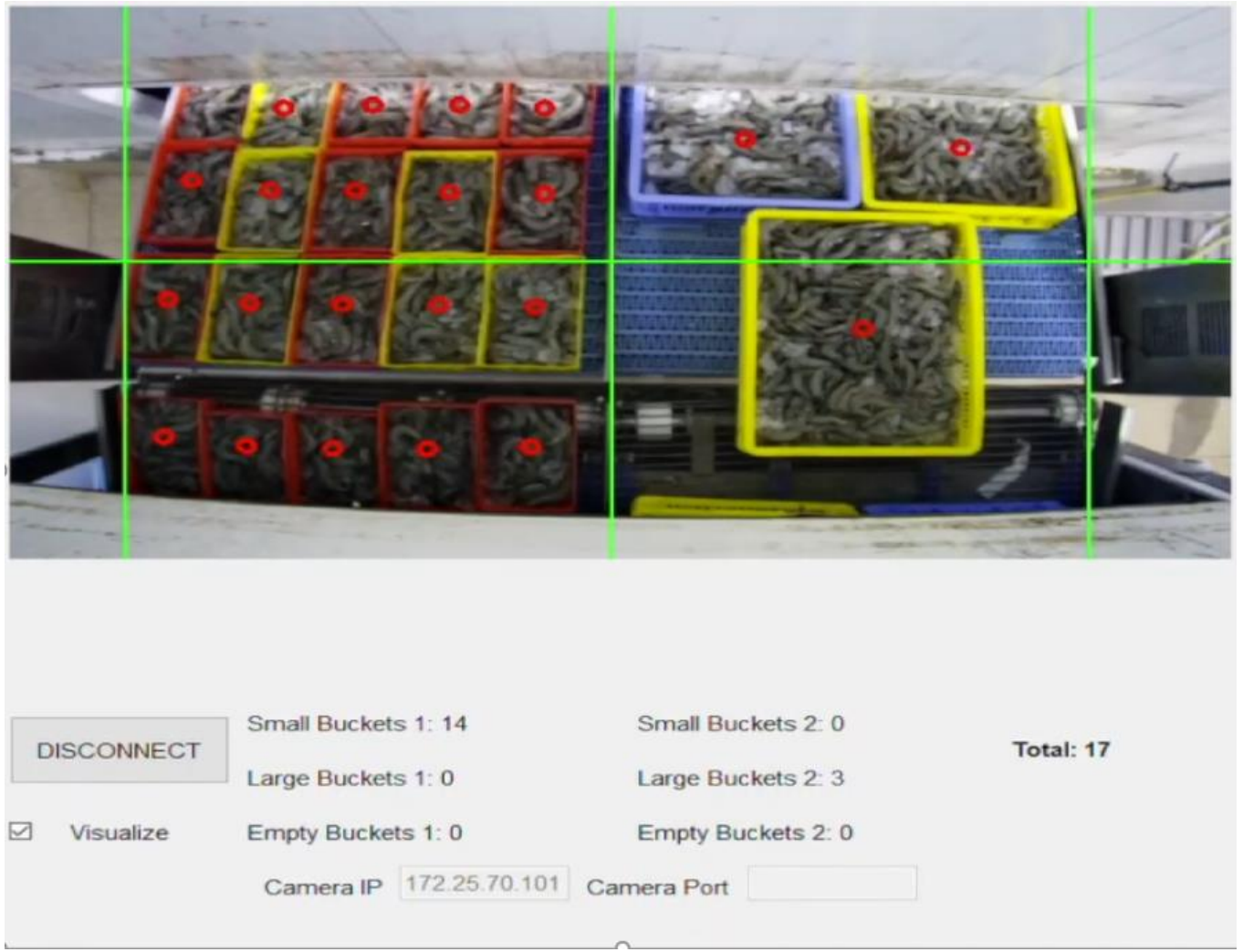
- Detect the number area
- Color of number and background
- ORC to get the number value

5. Shrimp Box Counting System

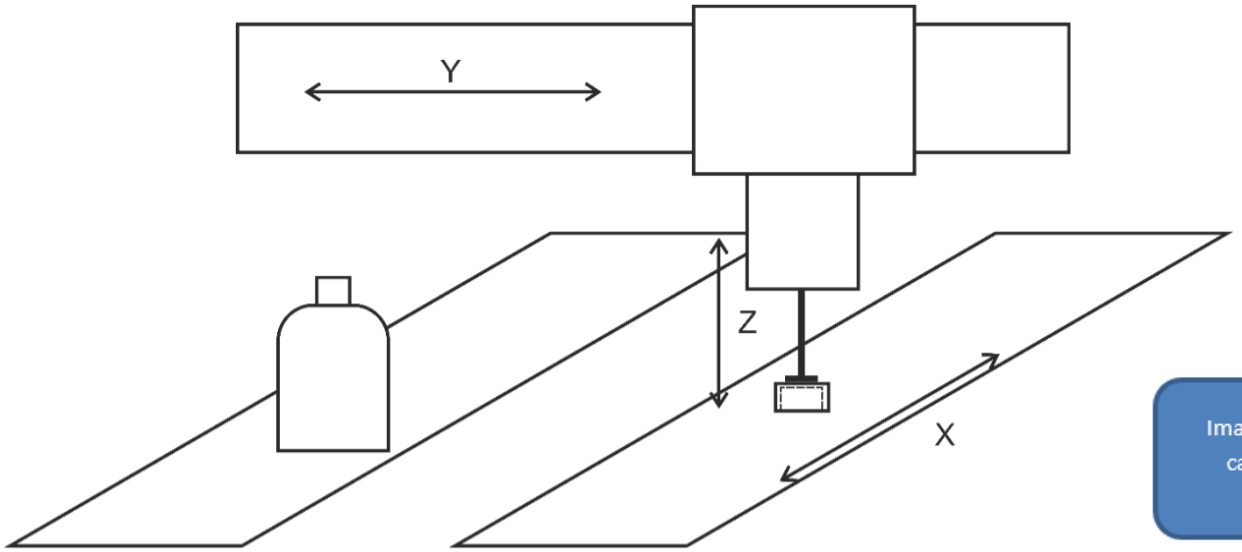
Box counting

Using object detection to detect and count box of shrimp.

- Video stream from RTSP camera
- UI is developed by PyQt5
- Applied in production

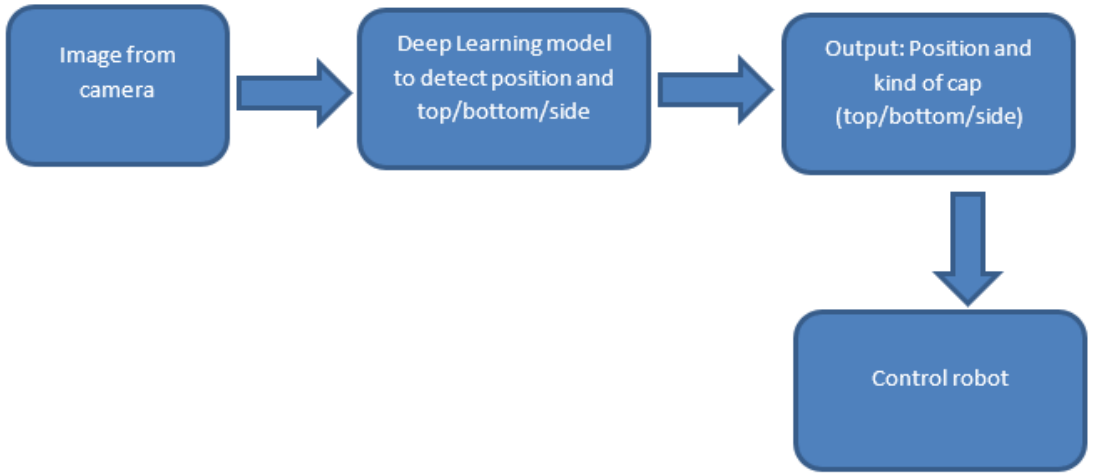


6. Cap Detection and Orientation Analysis



Cap detection and Orientation Analysis

Using object detection to detect and analyze orientation of cap. Using for robotic project.



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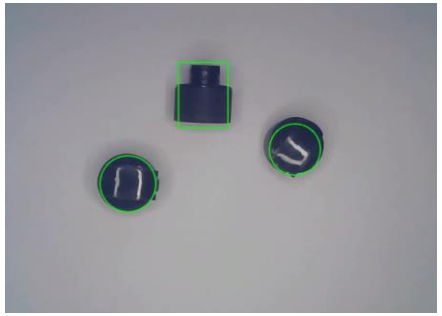
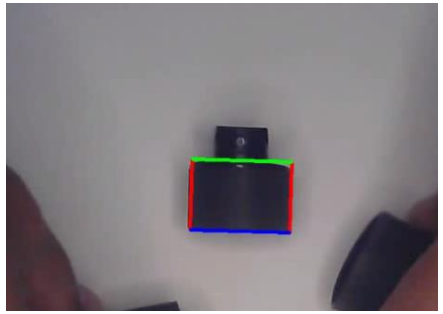
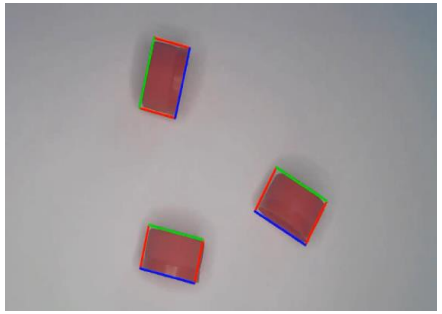
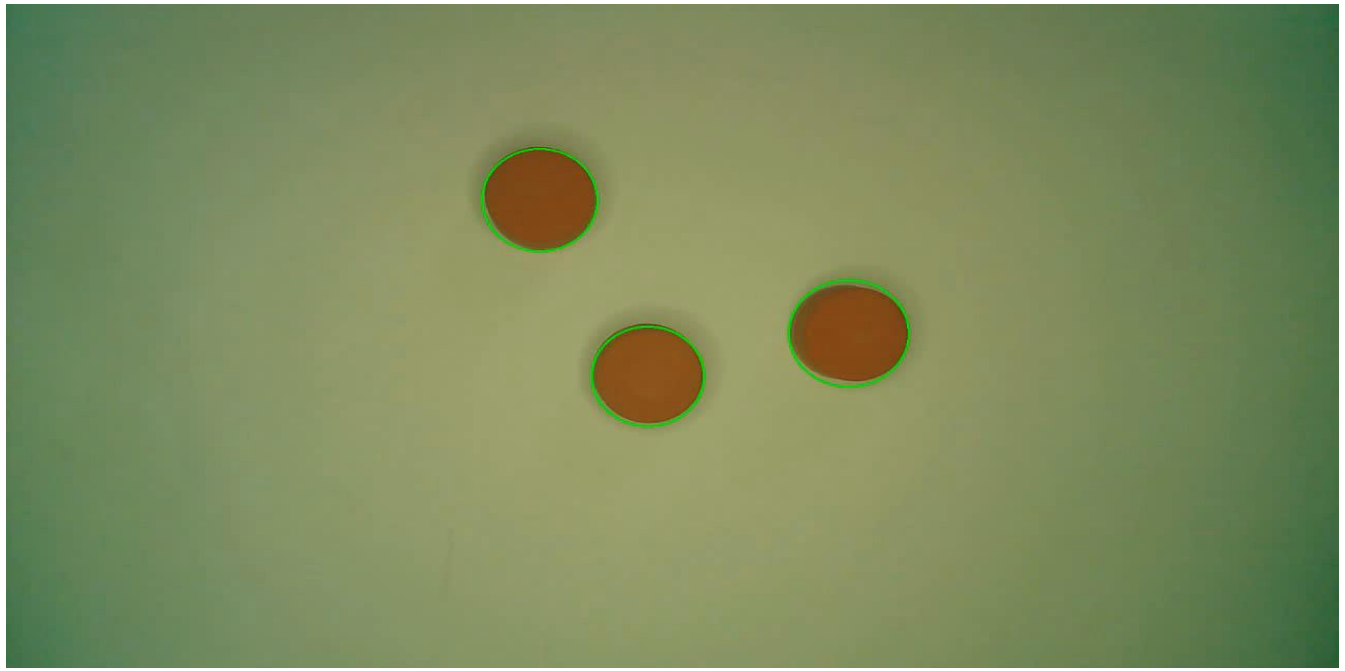




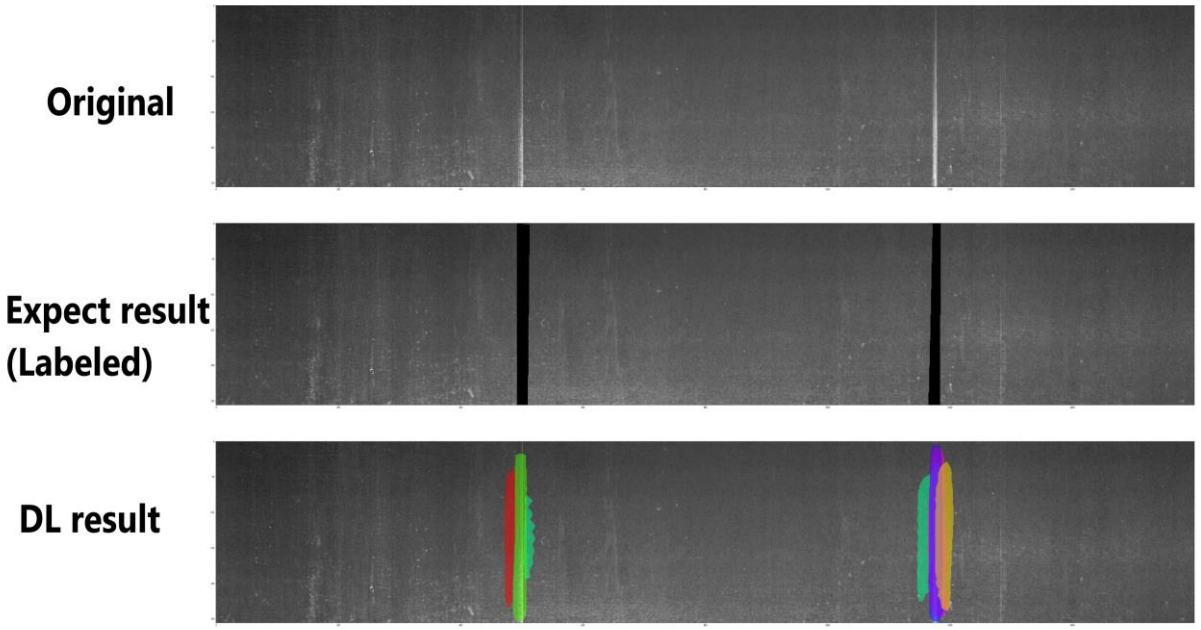


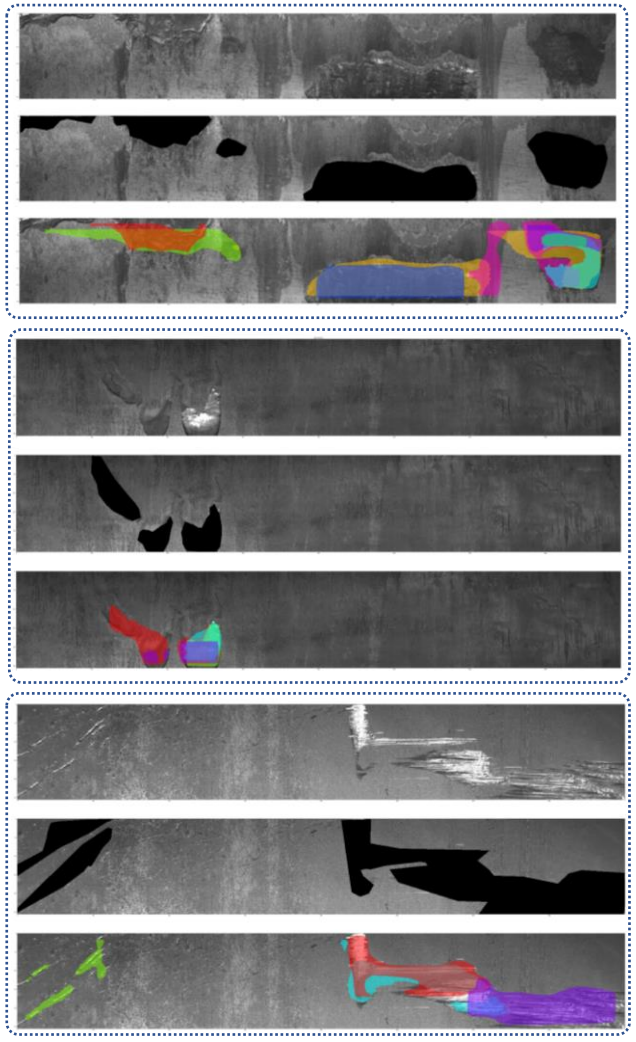


7. Steel Defect Detection and Segmentation

Requirements

- Detect and classify defect on steel sheet.
- Segmentation defect area

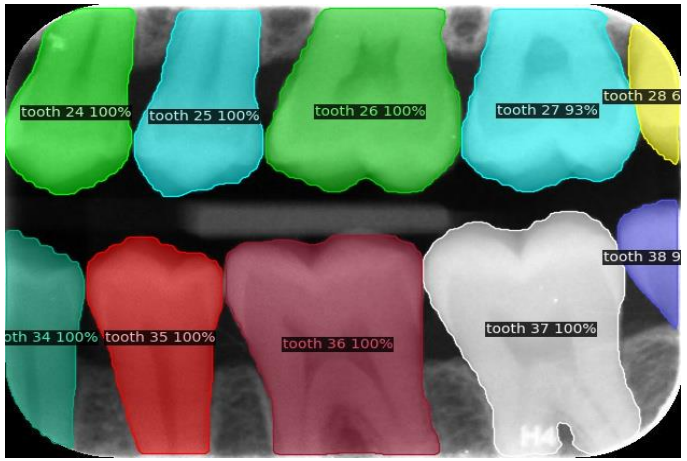




8. Tooth Segmentation

Requirements

- Identify tooth ID, segment tooth shape.
- Segmentation bad tooth area



9. Coin Classification

What is this for?

Double head-size of Australian coin can have thousand dollars value.

How it works?

A system with camera on top and bottom which capture 2 size of coin. Then using image classification to classify kind of size: *head, tail or not-any (not a coin)*

Classification model

A pretrain classification model to classify kind of coin (head/tail) and deploy into Raspberry Pi 4.