

# ParkSense

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# Motivation

## Background

- ① Parking Shortage
- ② Computer Vision



# Technology

## ① Computer Vision and Deep Learning

- (a) OpenCV
- (b) Ultralytics: YOLOv8



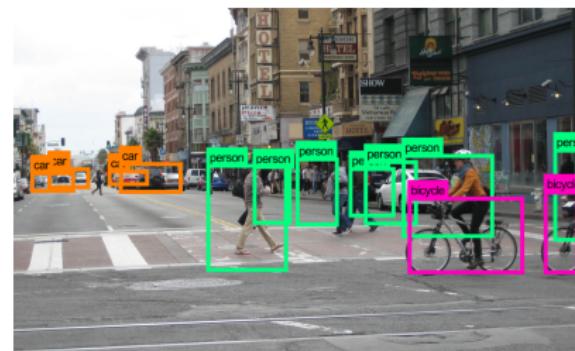
## ② Hardware

- (a) Raspberry Pi 2 Model B
- (b) Raspberry Pi Camera Module



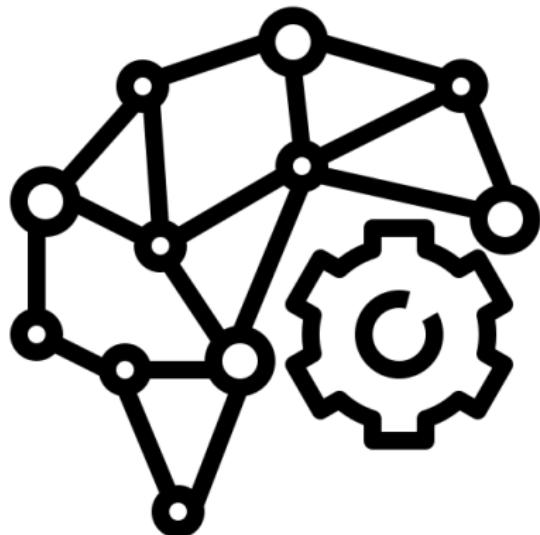
# What is Computer Vision?

- ➊ Subset of Artificial Intelligence (AI)
  - ⓐ Allows the Computer to "see"
  - ⓑ Crucial for Object Detection
- ➋ How Does It Work?
  - ⓐ Deep Learning
  - ⓑ Convolutional Neural Network (CNN)



# What is Deep Learning?

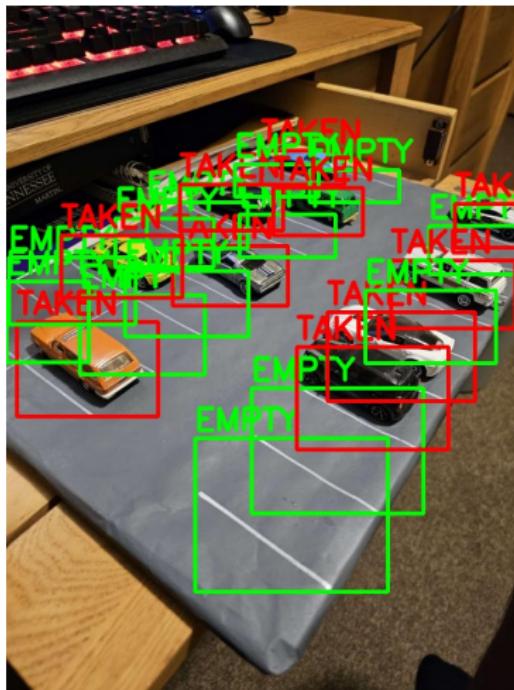
- ① Subset of Machine Learning
  - ⓐ What's the Difference?
  - ⓑ Allows the Ability to "learn" on Data.
  
- ② How Does It Work?
  - ⓐ Receives Labelled Data-set
  - ⓑ Iterates Over Data-set
  - ⓒ Forms a Model for Use



# Goals

- ① Provide a Web Dashboard with Lot Information
  - ⓐ Current Spot Availability
  - ⓑ Predictive Trends
- ② Set Precedent for Similar Projects
  - ⓐ Training Custom Data Sets with Machine Learning
  - ⓑ Portable Computing and Networking

# Demonstration



Webpage

# Challenges

- ① Compiling and running code on low power devices
- ② Building a stable model under varied conditions



# Future Work

- ① Monitor a real lot
- ② Push notifications
  - ⓐ Optional messages through text or email
- ③ Statistical analysis of parking trends

# Any Questions?

Questions?

Comments?

Further project/author information:

Please see our Github repo:

<https://github.com/Spencek7746/Senior-Design-Project>

