Information Technologies for Industrial Engineers

เทคโนโลยีสารสนเทศสำหรับวิศวกรอุตสาหการ

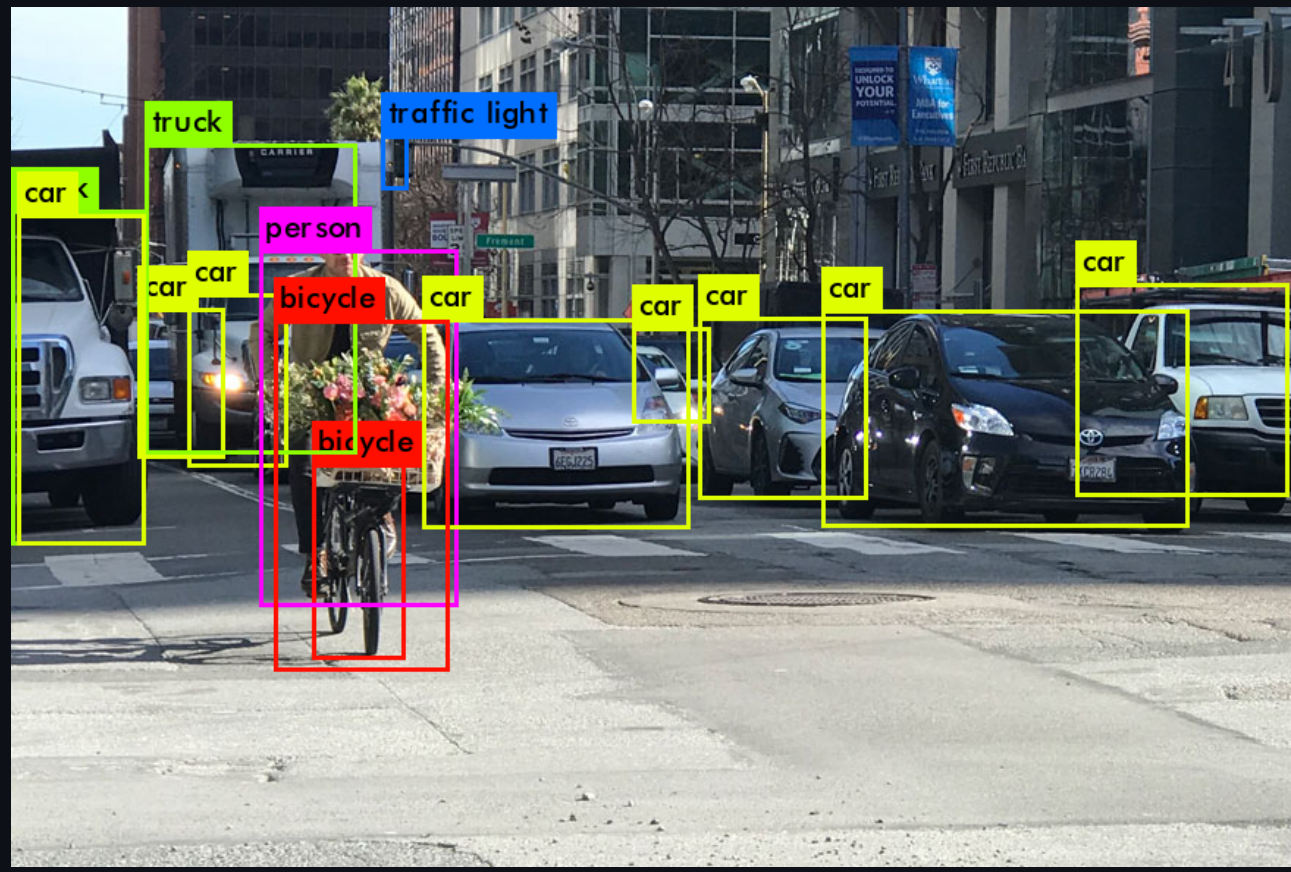
Object Detection Application

Image classification

- Dog (50%)
- ... (15%)
- ... (15%)

Object detection

- Car
  - Top: 500, Bottom: 200, Left: 50, right: 400
  - 50%
- Bicycle
  - ...
  - ...



Models

- **YOLO** (You Only Look Once)
  - Grid-based approach
  - Faster, less accurate
- **SSD** (Single Shot Detector)
  - Feature-map approach
  - Faster, less accurate (comparable to YOLO)
- **R-CNN** (Region-based Convolutional Neural Network)
  - Pixel classification
  - Slower, more accurate

Source

COCO dataset

- *Common Objects in Context*
- Large-scale image recognition dataset for object detection, segmentation, and captioning tasks.
  - Contains over 330,000 images.
  - Annotated with 80 object categories.
- https://cocodataset.org/#explore

COCO SSD

- This model detects objects defined in the COCO dataset.
- Uses SSD algorithm
- https://github.com/tensorflow/tfjs-models/tree/master/coco-ssd

Let's do it.

Setting up

- `npm create vite@latest`
- ...
- `npm install @tensorflow/tfjs @tensorflow-models/coco-ssd react-webcam`

Utilitiy files

- `./src/model.ts` 🔗
- `./src/App.css` 🔗
- `./src/utils.ts` 🔗

Main program

`./src/App.tsx`

Development with mobile

- Visit https://ngrok.com
  - Sign up
  - Sign in
- Go to `Cloud Edge` -> `Domains`
  - Create a new domain
  - Let's call it `DOMAIN_NAME`.
- Download software and extract to `Desktop`

- Open terminal and nagivate to `Desktop`
  - `cd Desktop`
- Authenticate
  - `./ngrok config add-authtoken AUTH_TOKEN`
  - `AUTH_TOKEN` *is from the website.*
- Run
  - `./ngrok http --domain=DOMAIN_NAME 5173`
- Open your `DOMAIN_NAME` in a mobile browser.
  - Do not use Line browser.