



TAMID GROUP



# EXPIRATION DATE TRACKING USING COMPUTER VISION

Introduction to Machine Learning

Final Project

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# TOPICS

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ABOUT THE  
COMPANY

2

PROBLEM

3

TASK/  
SUBTASKS

4

TOOLS

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CHALLENGES

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IMAGE  
PRE-PROCESSING

7

OBJECT  
DETECTION

8

OBJECT  
RECOGNITION

9

DEMO

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NEXT STEPS/  
CONCLUSION

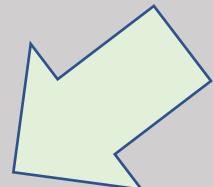
1

ABOUT THE  
COMPANY



## Name: Hashuk Inventory Ltd

We are here!!  
Track expiration  
dates!



2

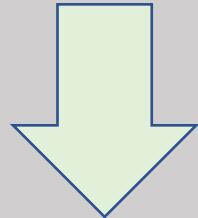
PROBLEM



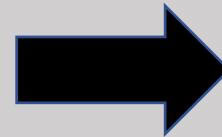
3

TASK/  
SUBTASKS

**Initial Task:** Given pictures of expiration dates in products, read them and detect if the product is expired. This is to reduce employee workload and product spoilage.



**Simplified Task:** Assume pictures are not rotated



01/05/13 H35 14:09

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TASK/  
SUBTASKS

# Image Preprocessing

# Object Detection

Generate More  
Data

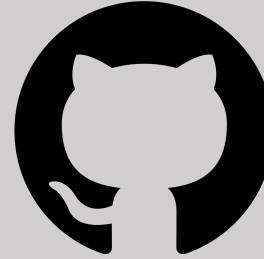
Text  
Recognition



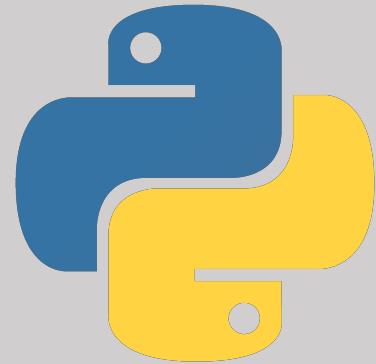
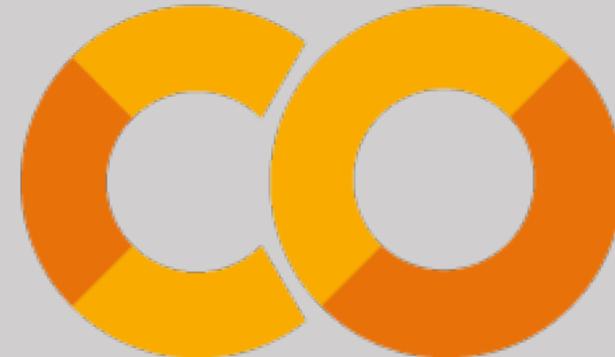
OpenCV



Tesseract



GitHub



python™



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CHALLENGES

Lack of data

Image  
Processing  
(define  
different  
arguments)

Sort Text

"Understand"  
text

Image Format

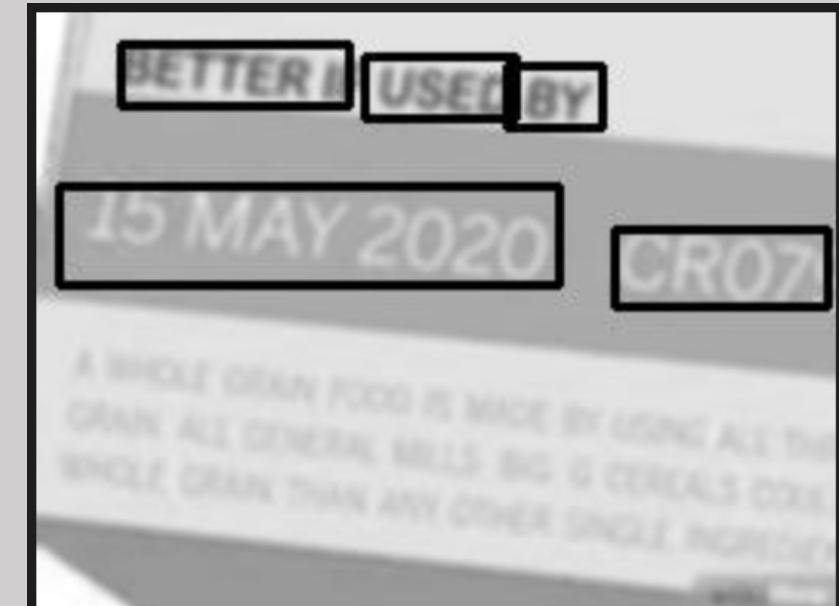
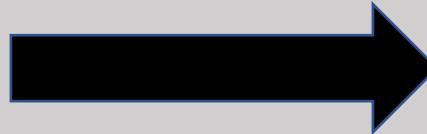
Front End  
Development

```
image = cv2.imread(f'uploads/{name}') # example image
gray = cv2.cvtColor(image, cv2.COLOR_RGB2GRAY)
arr = cv2.adaptiveThreshold(gray, 255, cv2.ADAPTIVE_THRESH_MEAN_C, cv2.THRESH_BINARY_INV, 11, 10)
arr = cv2.GaussianBlur(arr, (7, 7), 0)
kernell = np.array([[0,-1,0], [-1,5,-1], [0,-1,0]])
arr = cv2.filter2D(src=arr, ddepth=-1, kernel=kernell)
```



# OpenCV EAST model

```
def east_detect(image):
    ...
    return orig, boxes
```



```
def read_text(arr, boxes):
    results = [] # read all of example
    for box in boxes:
        (H, W) = arr.shape[:2]
        h = (H // 32) * 32
        w = (W // 32) * 32
        (newW, newH) = (w, h)
        rW = W / float(newW)
        rH = H / float(newH)

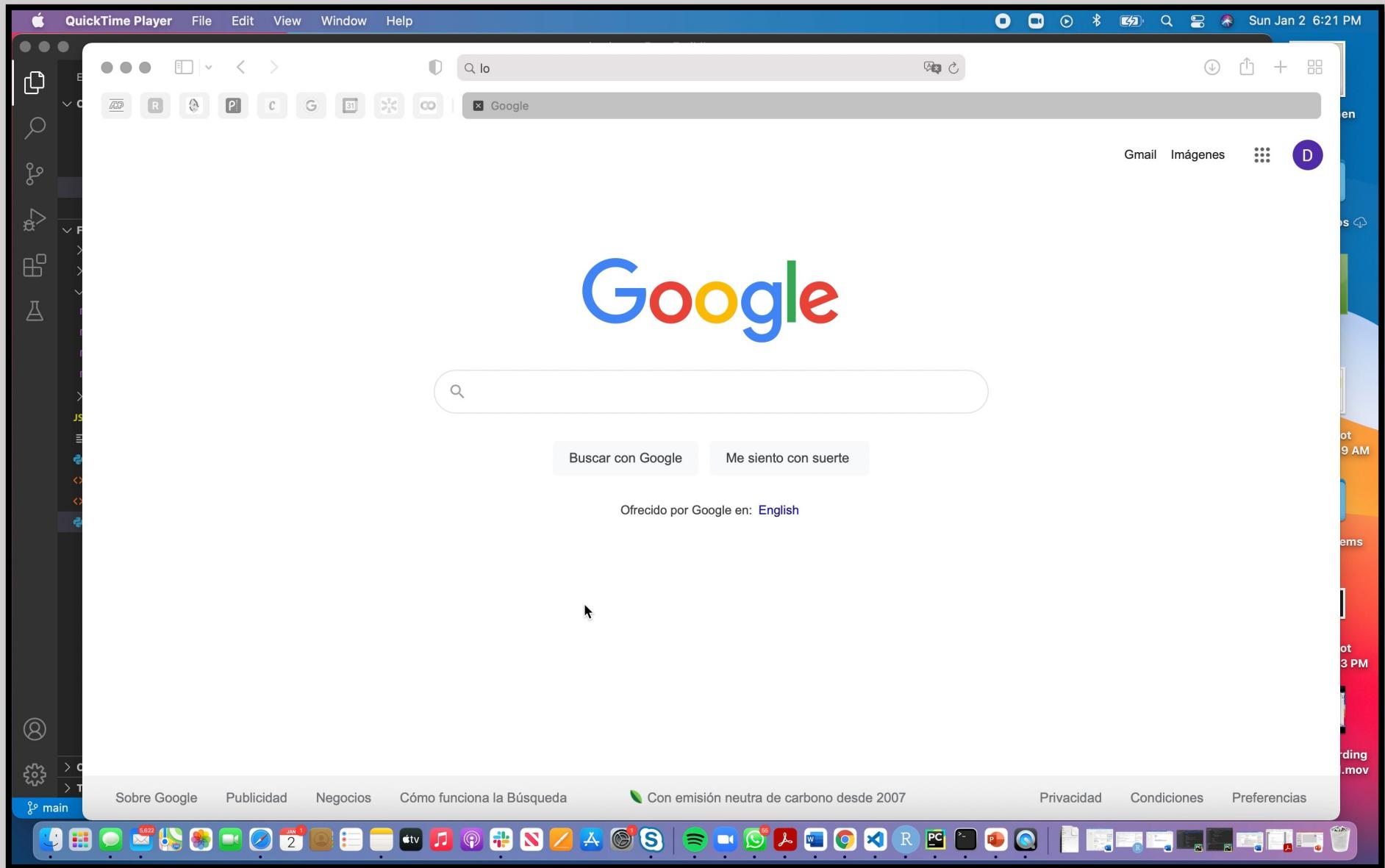
        startY = int(box[1] * rH)
        startX = int(box[0] * rW)
        endY = int(box[3] * rH)
        endX = int(box[2] * rW)

        roi = arr[startY:endY, startX:endX]

        text = pytesseract.image_to_string(roi, lang='eng', config='--psm 6')
        results.append(text)
    results = [x.strip() for x in results]
    results = " ".join(results)
    return results
```

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DEMO



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NEXT STEPS

Add  
Extra  
Layer to  
Model

Measure  
CER  
accuracy  
value

Work  
with  
Image  
Rotation

Improve  
Image  
Processing

Understand  
Expiration  
Date

Improve  
UI

**THANK YOU ! ! !**  
**Any Questions?**



# LINKS

- Github: <https://github.com/debbiecohen/MLProject.git>
  - Download it
  - Run the upload.py file
  - Open your browser port 8888
- Google Collab:  
<https://colab.research.google.com/drive/1UNQbLT0dGQISggLBQ56AfY41iCLhyWIK#scrollTo=9pQxuZz5DkOo>