CSCI 5722 Problem Set 1

Total: 20pts

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Due: 1/24/23

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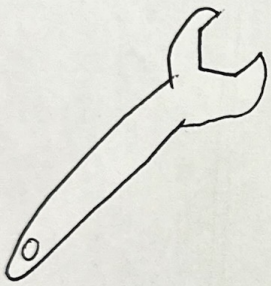
Q1. About Yourself (3 pts)

In the space below, sketch 3 objects that best represent yourself.

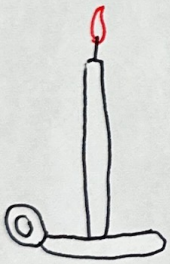


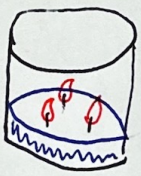
Q2: Challenges in Computer Vision (2 pts)

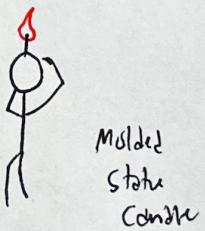
Illustrate the following with your "original" sketches.

a. VIEWPOINT VARIATIONS

b. INTRA-CLASS VARIATIONS (3 variations per class)







Q3: Illumination Variations (2pts)

Take 4 photos of an object in your room under different lighting conditions. Paste them below. Maximize illumination variations, while keeping scale and viewpoint constant.

1.

2.

3.

4.

Q4: Low, Mid, High-level Vision (3 pts)

In the space below, create an original sketch to illustrate the 3 levels of computer vision tasks

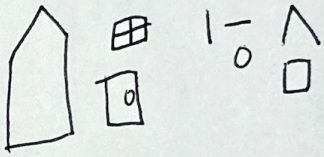
Low

Denoise / Reshape

THE

Mid

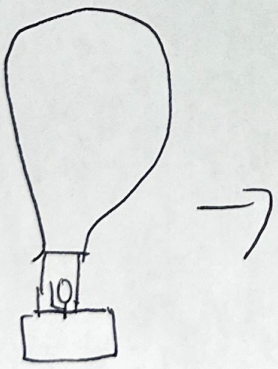
Share Detect / Share Patterns



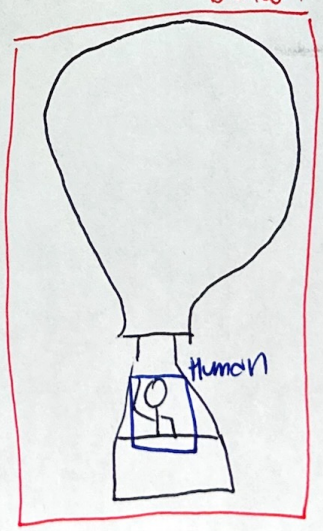
High

Classification

Classification



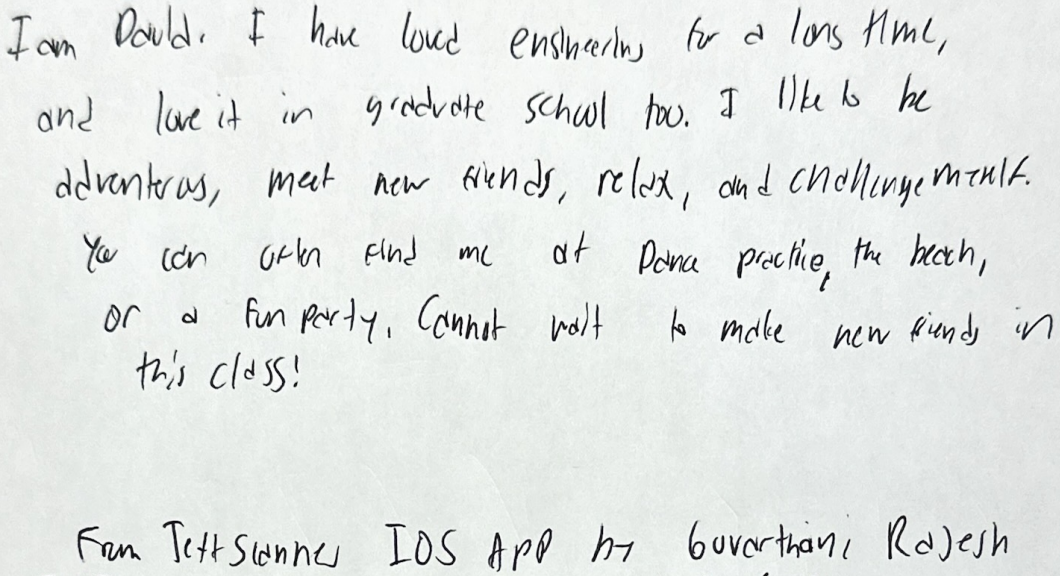
Balloon



Q5: OCR TEST (3 pts)

Hand write 50 words about yourself in your native language. Run OCR. Paste the result. Highlight errors.

a. Hand written text (2)



From TextScanner IOS App by Guvarthani Rajesh

b. OCR result with errors highlighted (1)

Q6. Object Recognition Test (4 pts)

Install an object recognition app and test it around your home. Find examples of the following.

Name of the app: ~~Seeme~~ Iryss

a. "Almost" correct

SCREENSHOT

Ground Truth Label:

Shoe

Predicted Label:

~~Vfeed~~ Running Shoe

b. Very wrong but funny

SREENSHOT

Ground Truth Label:

Back pack

Predicted Label:

Neck Brace

Q7: Python / Numpy (3 pts)

Compute these using Numpy

Let $A = \begin{bmatrix} 4 & 2 & 3 & 7 \\ 3 & 5 & 2 & 1 \\ 1 & 9 & 4 & 2 \end{bmatrix}$, $B = \begin{bmatrix} 2 & 7 & 6 \\ 1 & 3 & 2 \\ 4 & 5 & 1 \end{bmatrix}$

$(AA^T)^5 = \begin{bmatrix} \quad \end{bmatrix}$

$(A^TA)^2 = \begin{bmatrix} \quad \end{bmatrix}$

$(BA - (A^TB)^T)^4 = \begin{bmatrix} \quad \end{bmatrix}$