Orientation + Face Detection Intro

TJ CV Officers

September 15, 2021

1 Introduction

Welcome to Computer Vision Club! Here, members learn the theory and applications of computer vision and computer graphics, sharpen their skills through competitions, and conduct computer vision research. We meet every Wednesday B block in Room 200. No experience is required to attend!

2 Officers

- Captains: Sagar Gupta, Ron Nachum
- Teaching Coordinators: Arya Grayeli, Vishal Kotha
- Sponsor: Dr. Gabor

If you have any questions, feel free to email us at **tjcomputervision@gmail.com** or message the officers via Facebook. Also make sure to join our Facebook group at **https://www.facebook.com/groups/tjcomputervisionclub** and check our website **https://activities.tjhsst.edu/computervision/** regularly for updates, past lectures, etc.! The website has a google form you can fill out to be put on our mailing list.

3 Lectures

In the fall, we will mainly focus on human and computer vision theory, such as the camera model, feature extraction, object detection, and motion. In the spring, we will explore broader, more complex topics such as AI-based image processing, computational photography, and computer graphics. At the end of the year, we will have a few lectures on the most recent advances in vision and graphics and conclude with guest lectures.

4 Competitions

4.1 In-House

We plan to host more regular in-house competitions through Kaggle Classroom this year to reinforce the lectures. Competitions can be accessed along with the respective lectures on the website. Each competition begins the day of the lecture and ends at 11:59:00 PM the following Tuesday. Rankings from these contests may factor into officer eligibility for next year. We highly encourage that you participate in these contests - they are a great way to apply what you have learned.

4.2 Kaggle Contests

Kaggle is a data science competition platform open to the public. There are many contests directly involving computer vision, and many more where using computer vision techniques can greatly increase your performance. They are a great learning experience and we recommend that you create an account if you don't have one already.

5 Research

Computer Vision Club encourages its members to pursue research in vision and graphics and participate in science fair competitions. The officers have extensive combined experience in research and programming. Whether you're new to programming/looking to add vision and graphics to your projects/wanting to formalize your research, we are happy to help with whatever questions or requests you may have.

6 Intro to OpenCV

6.1 What is OpenCV?

OpenCV provides a very powerful framework for projects involving images and videos. It provides low-level computer vision functions, such as masking, blurring, and transforming images, edge detection, and basic image segmentation, as well as a statistical machine learning library (Decision trees, KNN, SVMs). OpenCV is compatible with multiple programming languages, and multiple platforms, including Numpy, Tensorflow, Keras, and PyTorch.

6.2 Installation

Make sure that python and pip are already installed. For Windows, install with **pip3 install opencv-python**. For Linux, use **sudo pip install opencv-python**. In any python program, this package would then be imported using **import cv2**.