***Davis Data Science Club***

*Spring 2023*

*Sign Language Detection in Python using Tensorflow*

**Reference:**

Real Time Sign Language Detection: <https://youtu.be/pDXdlXlaCco>

Install Tensorflow: <https://youtu.be/dZh_ps8gKgs>

Note: Will follow the above references *deeply* for the setup and training models, then upload our own images for detection.

\*\*Will require a real time camera (webcam) for this project\*\*

**Concept:** Computer Vision

**In-use:** Python, Tensorflow Object Detection Model, Deep Learning, Trello (to assign tasks and coordinate)

**Target:** Detect 26 alphabets in American Sign Language in real time using a webcam and using Images

**Difficulty Level:** Intermediate

**To-Do:** Build and train a model that detects 26 alphabets in American Sign Language

**Extension in future:** Action Recognition for Sign& Export model to Tensorflow JS for integration in ReactJS Apps

**Meeting Times:** Meet once a week for at least 30-45 minutes can be in-person or online; meeting time to be decided later through when2meet:

***My best available times:*** Tuesday afternoon onwards & Thursday Morning; weekends maybe

**8-week plan:** **(Tentative)**

| **Date:** | **Week:** | **Start/In-Process Tasks** | **Completed Tasks** | **Team Members (TBD)** |
| --- | --- | --- | --- | --- |
| 04/18 | 1 | Clone Repo; Collect & Label images (can require more time and get pushed by a few days or a week) |  |  |
| 04/25 | 2 | Create Label Map & Generate TFRecord | Finish collecting and labeling Images (can require more time and get pushed by a few days or a week) |  |
| 05/02 | 3 | Model Configuration & Updating it | Label Map & Generating TFRecord |  |
| 05/09 | 4 | Train model | Model Configuration & Updating it |  |
| 05/16 | 5 | Detecting in real-time | Loading and Training Model;  Detecting in real-time |  |
| 05/23 | 6 | TBD |  |  |
| 05/30 | 7 | TBD |  |  |
| 06/06 | 8 | TBD |  |  |

26 Alphabets Chart: <https://deafchildren.org/2019/06/free-asl-alphabet-chart/>

What’s Covered:

1. Labelling Images for Object Detection
2. Training Tensorflow for Sign Language
3. Detecting Sign Language in Real Time

Steps:

1. Clone repo
2. Collect Images - code
3. Setup labelImg
4. Label Images
5. Update labelmap
6. Train model
7. Update checkpoint
8. Detect

Tasks:

* Everyone has to clone repo on their pc
* Collect Images - code : will mostly be provided by me, just for convenience since everyone has to start collecting images themselves
  + However, in the code will have to make a minor changes according to the alphabet they are collecting images for; that includes changes in label list and number of images

\*\*The tasks will have to be done in the following order\*\*

\*\*Some can be done simultaneously and collaboratively by different members\*\*

1. Setup Labelling:
   * 26 alphabets : {a,b,c,.....,z,}
   * Collect and label 10 images for each alphabet
   * Each person would have 4-6 alphabets
2. Create Label Map and generate TFRecord for Train and Test
   * Will be using 80/20 for training and testing the model
3. Copy Model Config to Training Folder and Update Config for Transfer Learning
   * Have to update the configuration according to ‘our’ project
4. Train model - **EVERYONE** has to train on personal pc - will take a long time according to our number of steps and the number of objects
5. Detect in real-time - **EVERYONE** has to train the model