CAPSTONE PROJECT

SIGN-LINGUAL

BY SIMREN BASRA

SIGN-LINGUAL: AN OVERVIEW

- Over 300 different sign languages are spoken by more than 72 million people worldwide.
- Great disparity between signers and non-signers.
- To bridge the gap between signers and non-signers, my idea is to develop a machine learning sign language interpreter.

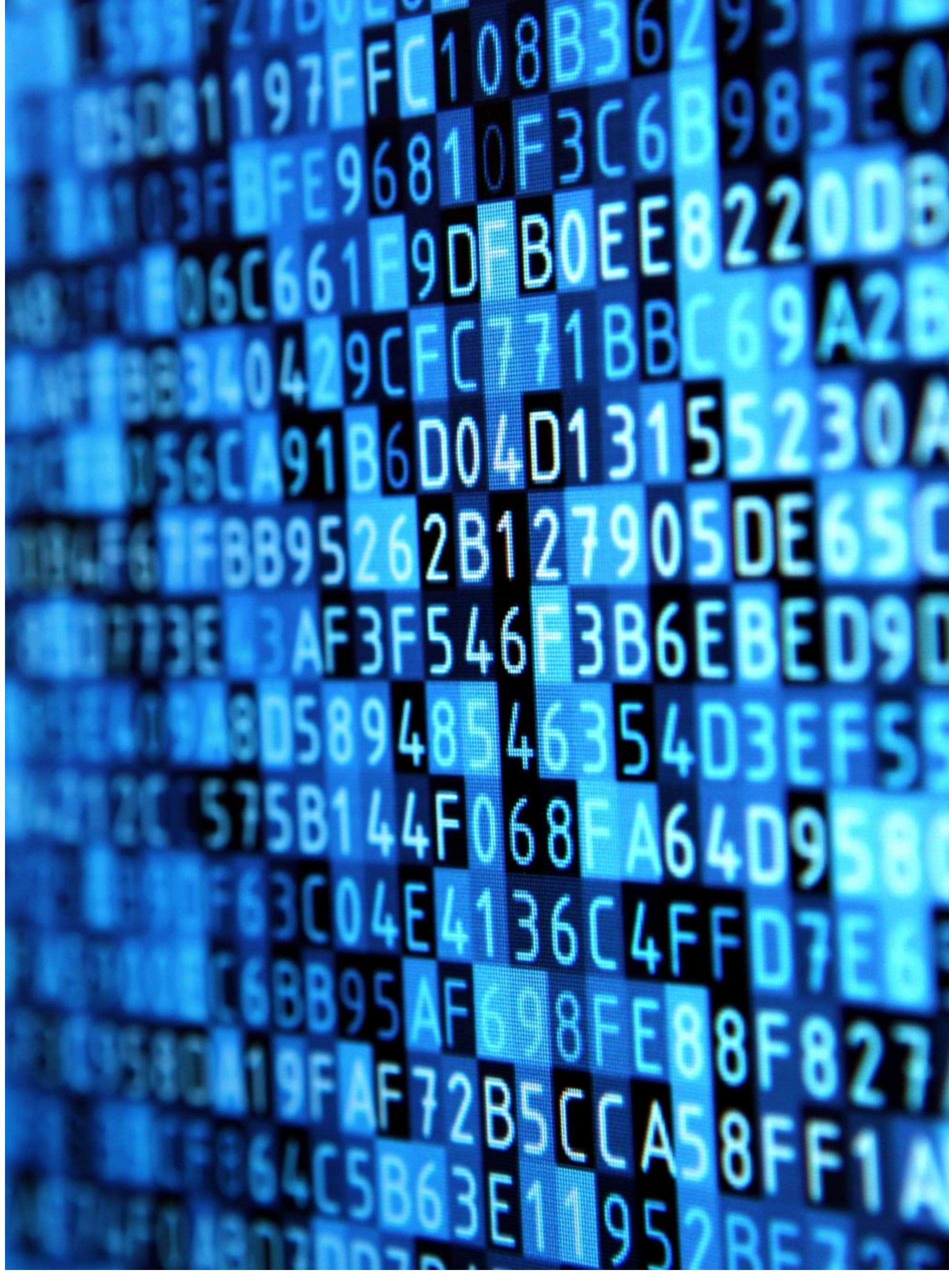
PROPOSED VISION

- Initially use the simpler MNIST Sign Language Dataset to train a model to classify sign language images for all letters of the alphabet except J and Z.
- Evaluate the model accuracy and performance
- Advance to WLASL (Word-Level American Sign Language) dataset where instead of images I will be working with video-based data.

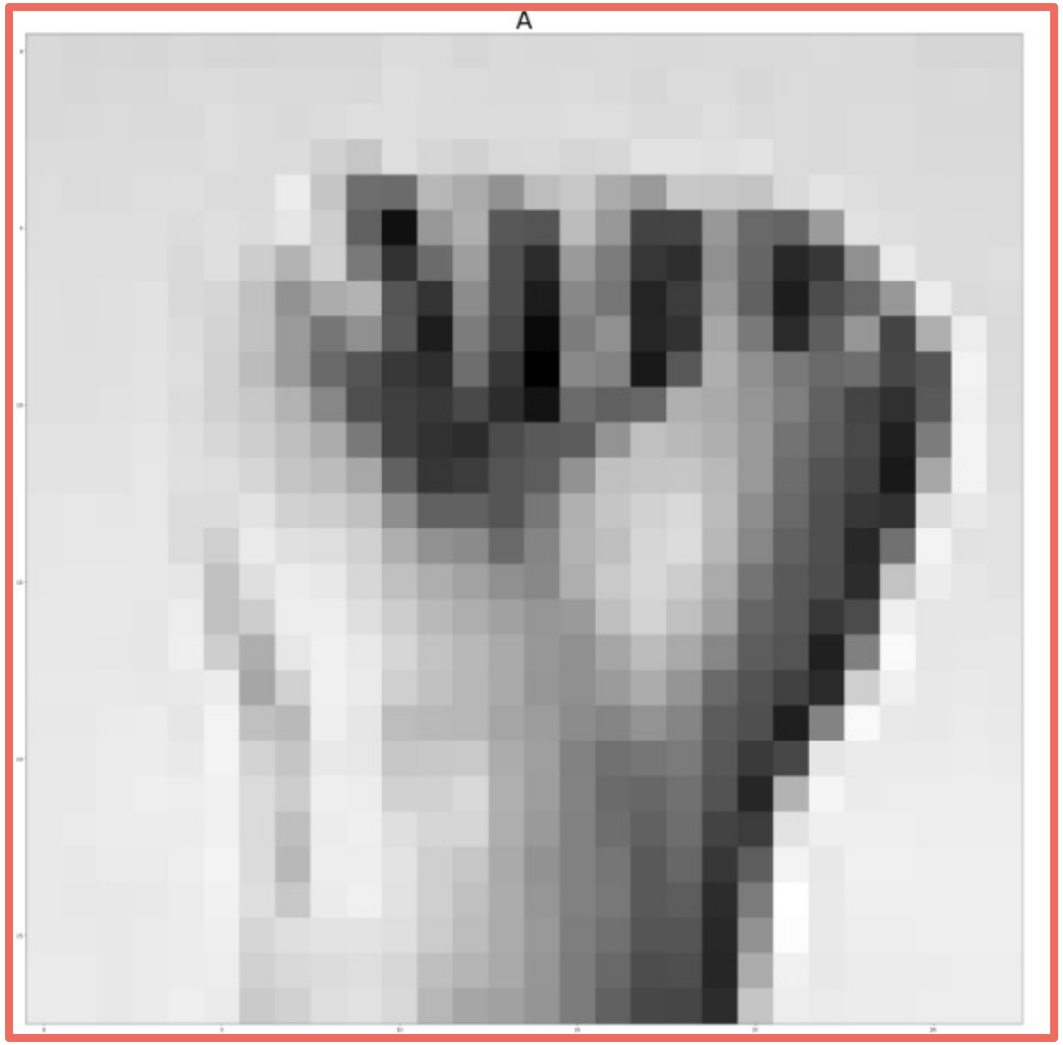
DATASET OVERVIEW

MNIST Sign Language Dataset:

- ~1400 images per letter (class)
- No data for letters J and Z
- Each image consists of 784 pixels (features)

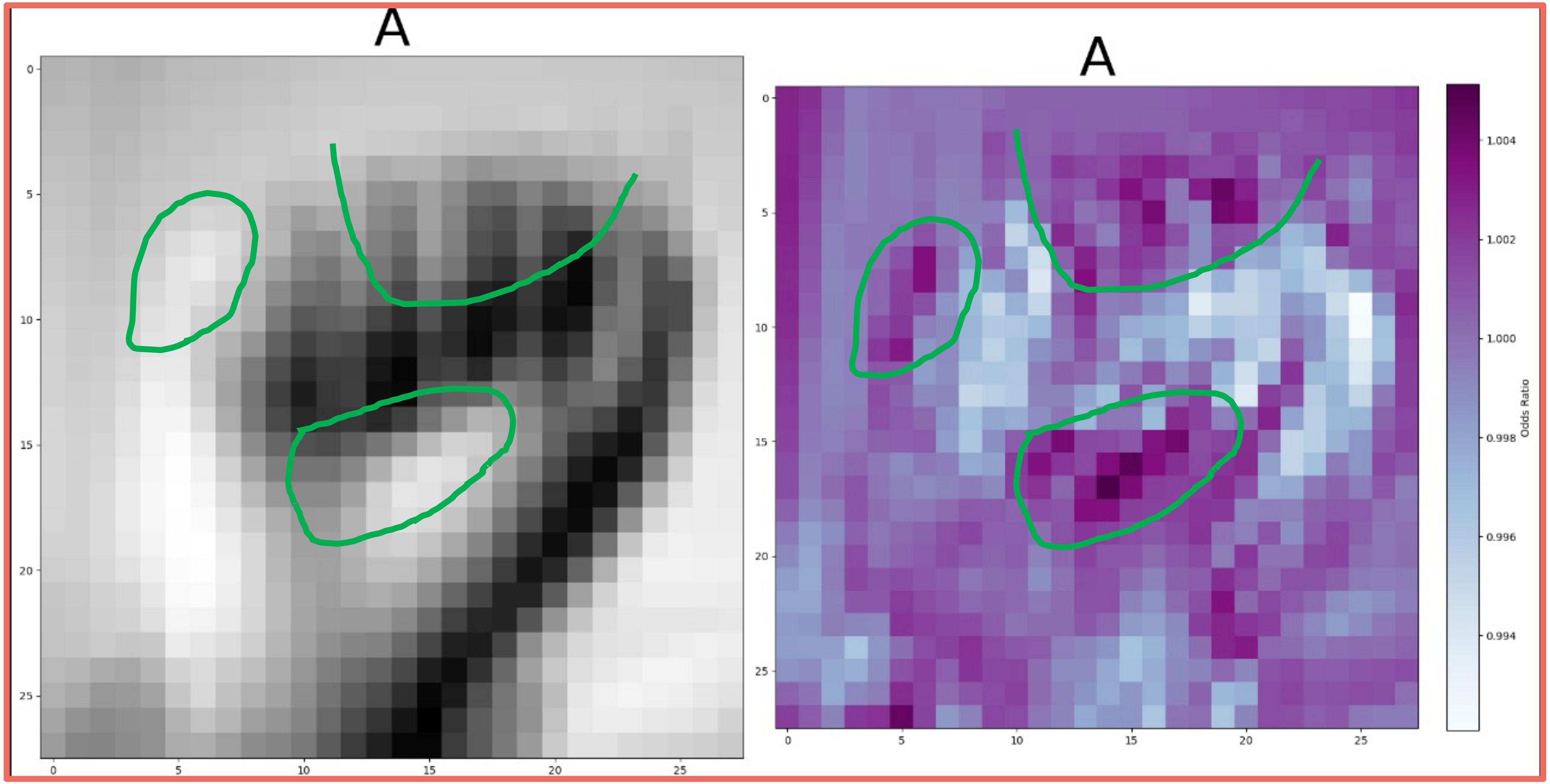


INSIGHTS



- Pixel intensity for greyscale images ranges from 0 (black) to 255 (white)
- A single image is presented as an 1D array of 784 elements – each element represents the pixel intensity of a single pixel.
- To visualise the image, the 1D array is reshaped to have the dimensions (28,28), each element in the new reshaped array represents the pixel intensity of a given pixel.

INSIGHTS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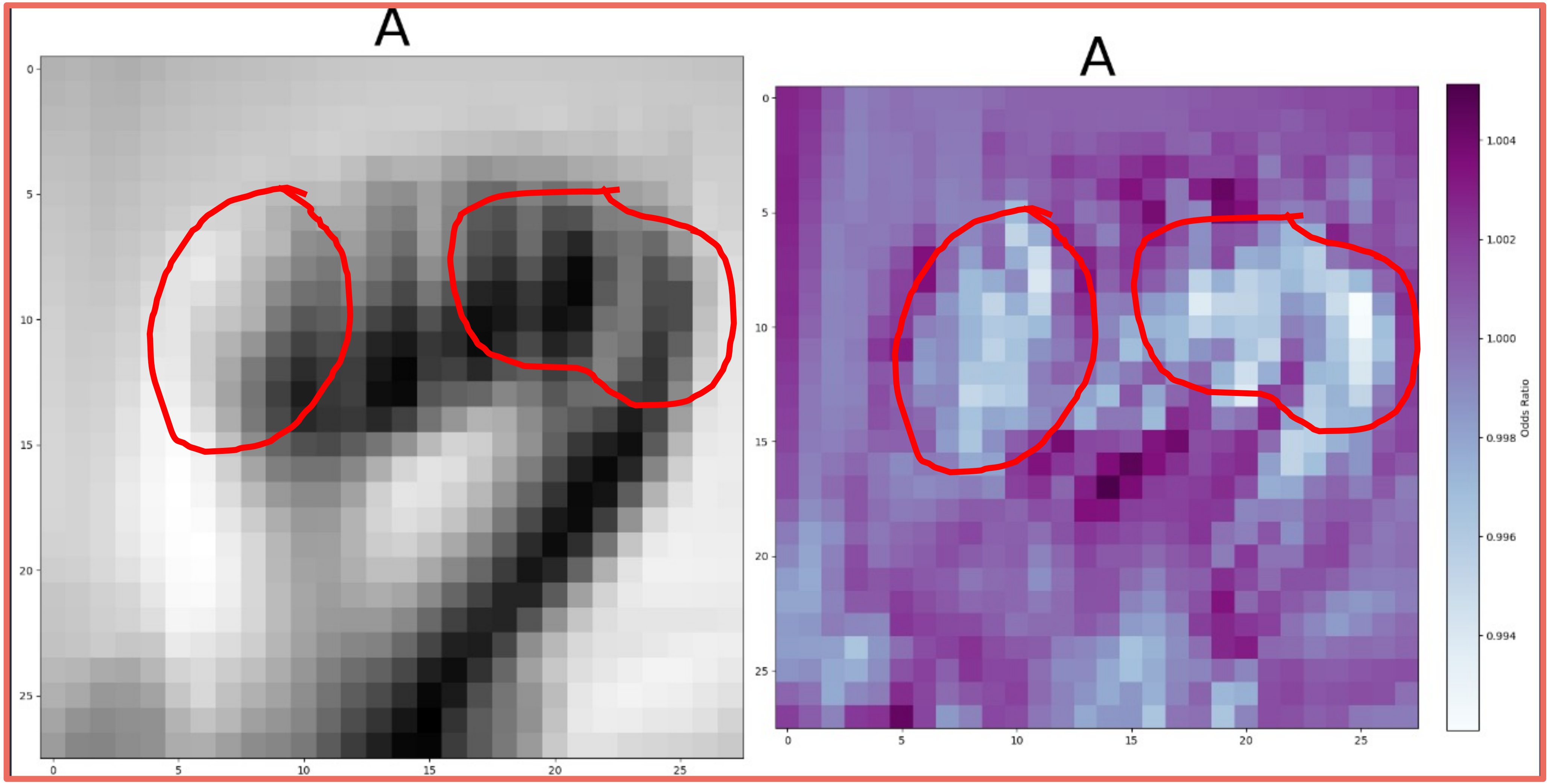
Odds Ratio

INSIGHTS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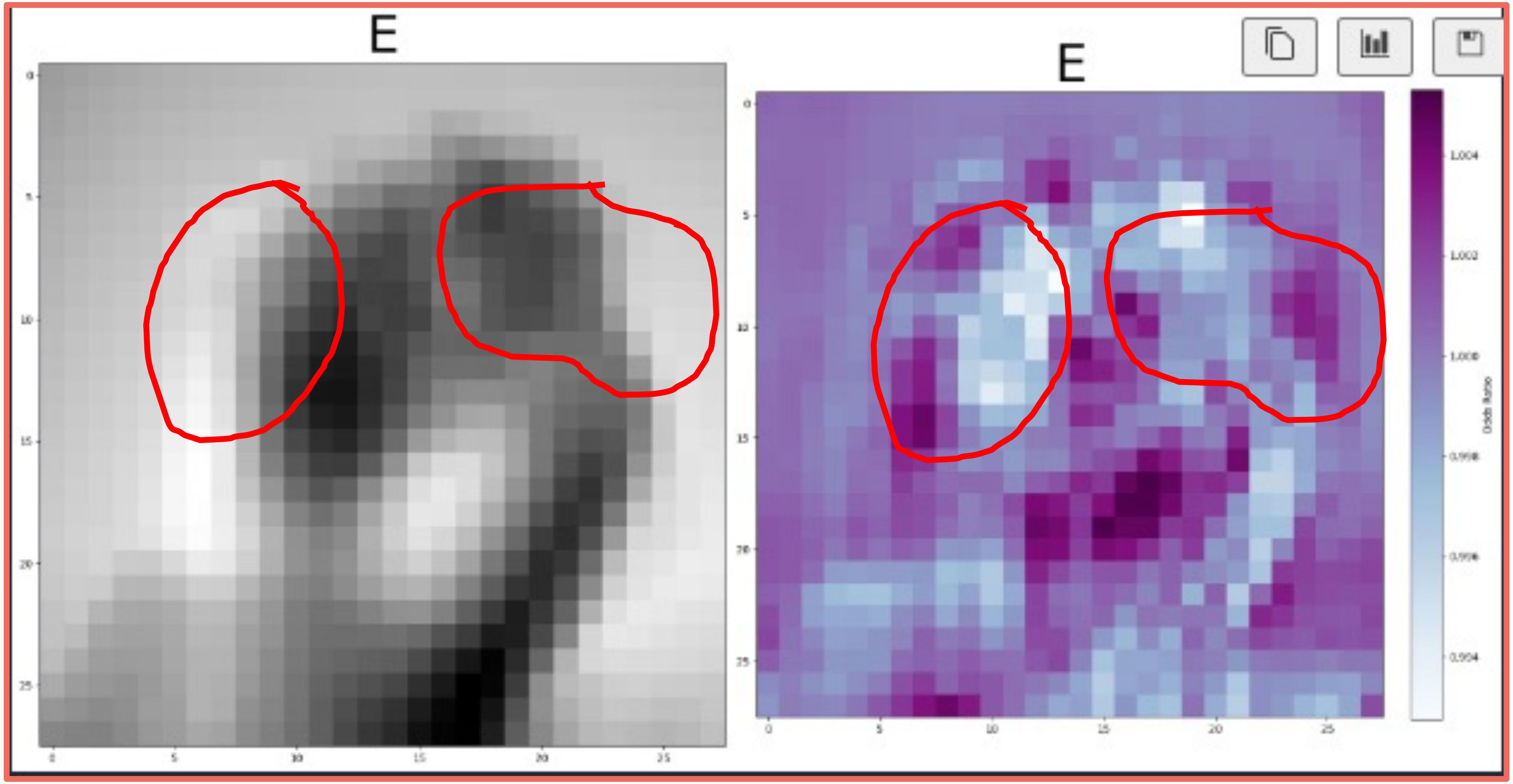

NEXT STEPS

- **Testing the model** : Use images of myself signing letters to assess ability of the model to generalise to new unseen data where format is slightly different.
- **Explore alternate models:** Experiment with different machine learning models/approaches to classify data and compare performance to my current model.
- **Exploration of WLASL Dataset:** Start familiarising myself with contents of the data. Extract frames from the videos to use as input data for a classification model.