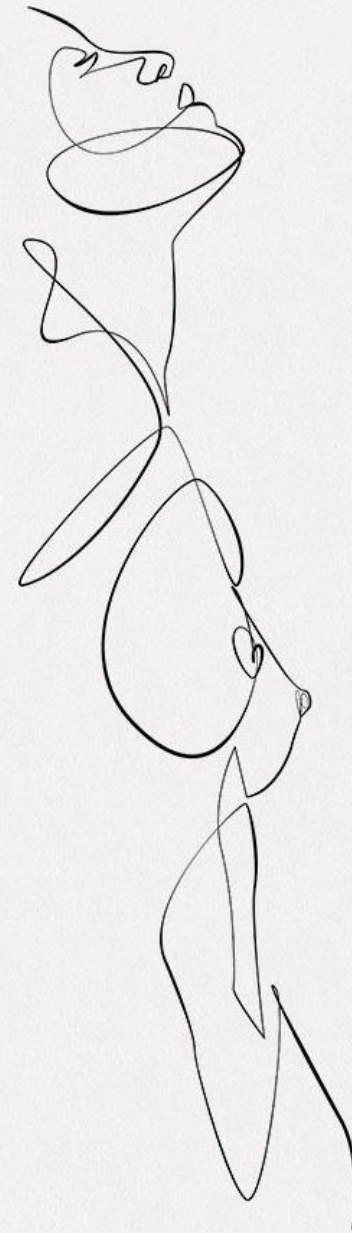
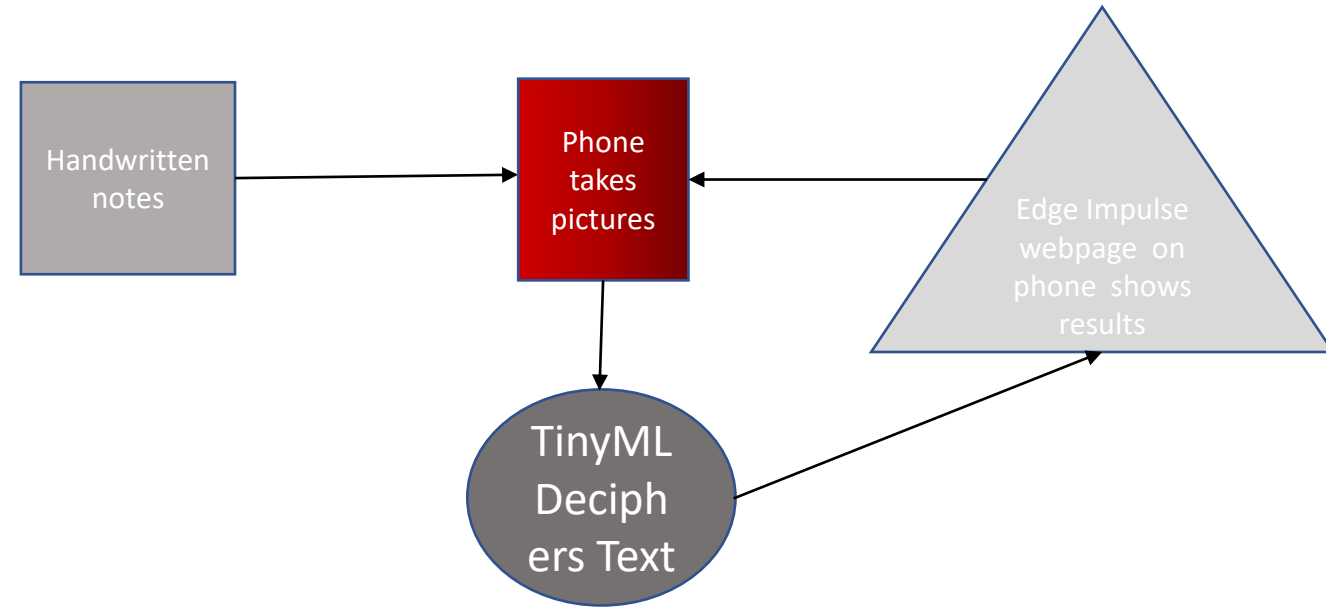
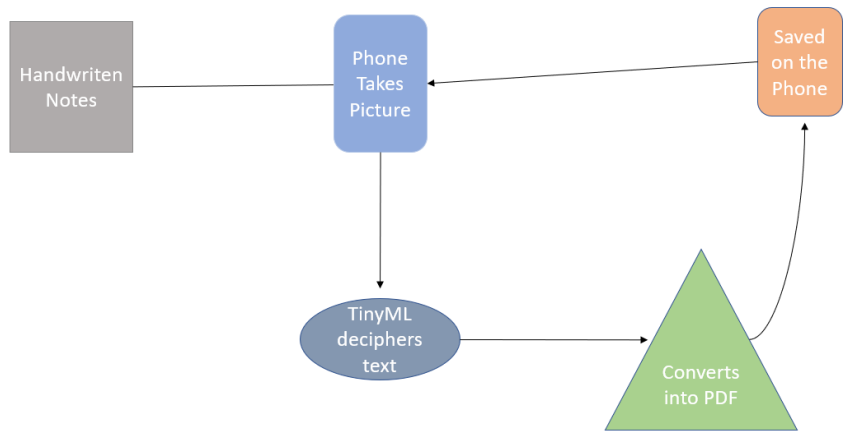


From Paper to Screen

Prototype



Architecture



Machine Learning Technique

- Using Edge Impulse

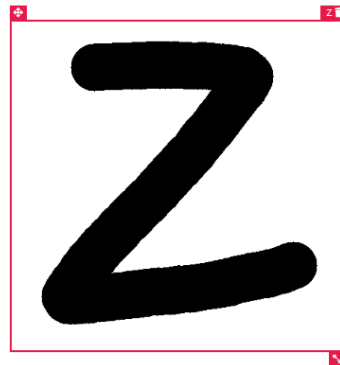
Alphabet

Fomo(Faster Objects, More Objects) Mobile NetV2

Confusion Matrix

Data: Images

Labelling Boxes



- Jupyter Notebook
CNN Neural Network

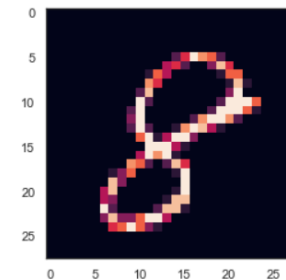
Numbers

Confusion Matrix

Data: CSV File

Reconstructing Images
through pixels

```
In [48]: random_seed=2  
# Split the train and the validation set for  
X_train, X_val, Y_train, Y_val = train_test_  
  
In [49]: # Some examples  
g = plt.imshow(X_train[0][:,:,0])
```

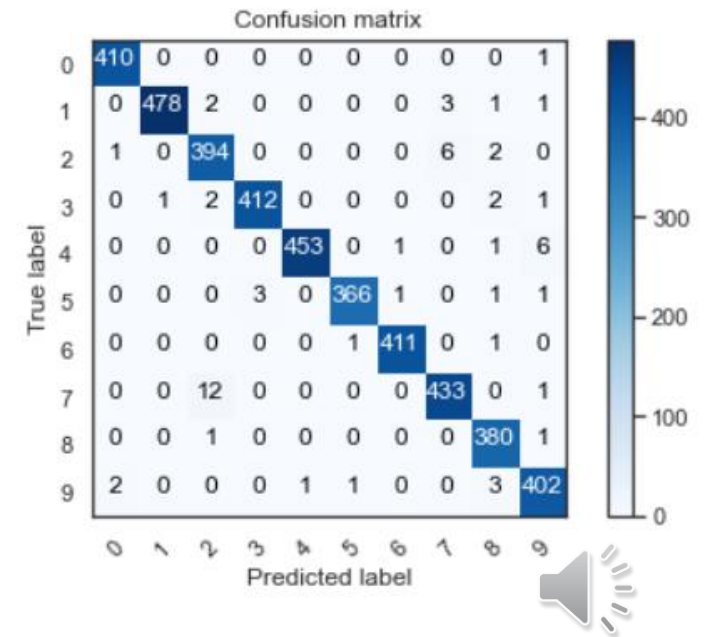


Machine Learning Technique

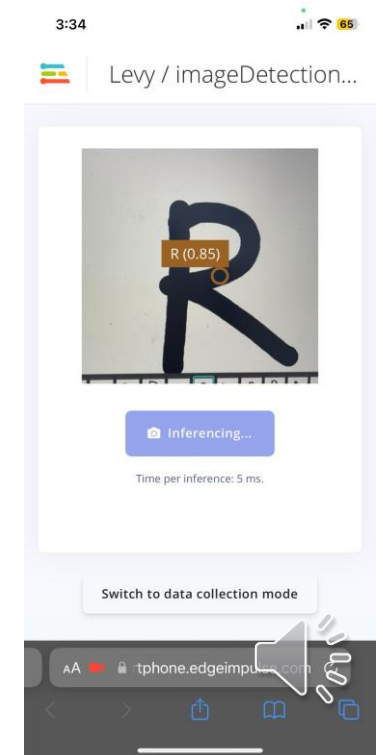
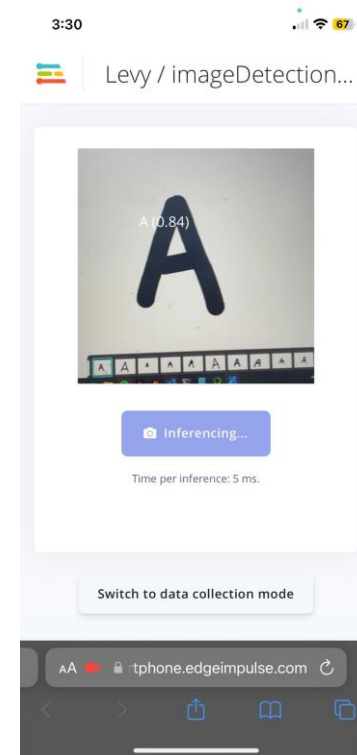
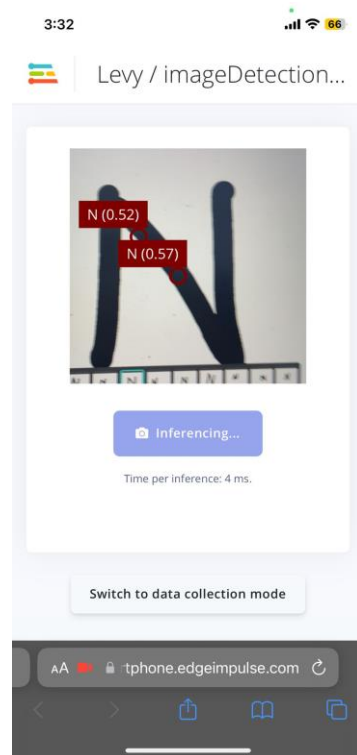
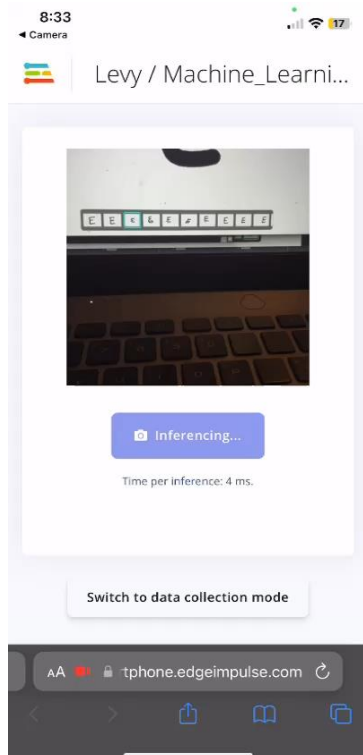
- Using Edge Impulse Alphabet Performance



- CNN Neural Network Python Numbers Performance



Edge Impulse Phone deployment



Risks, Limitations & Unexpected

- Risks: The mayor risk is confusion between the 26 classes especially in the real world where Word are so close to each other
- Limitations: To build a more accurate prototype I need a larger database and I was on the limit of what Edge Impulse allowed to process without paying
- Unexpected: Textures, lighting and distances between objects play a major part in detecting objects
- Accuracy Improvement
- Uploading on neural network to Edge Impulse



References

- **Dataset:** Yassineghouzam. (2017). Introduction to CNN Keras - 0.997 (top 6%). *Kaggle*.
<https://www.kaggle.com/code/yassineghouzam/introduction-to-cnn-keras-0-997-top-6/input>
- **Dataset:** *The Chars74K image dataset - Character Recognition in Natural Images*. (n.d.). Chars74K. Retrieved May 1, 2023, from <http://www.ee.surrey.ac.uk/CVSSP/demos/chars74k/>
- *Detect objects with bounding boxes - Edge Impulse Documentation*. (n.d.). Retrieved April 16, 2023, from <https://docs.edgeimpulse.com/docs/tutorials/object-detection>
- *Building custom processing blocks - Edge Impulse Documentation*. (n.d.). Retrieved April 16, 2023, from <https://docs.edgeimpulse.com/docs/edge-impulse-studio/processing-blocks/custom-blocks>

