CS 4795 Final Project Proposal

Benjamin Talbot

3574678

Subject Description

Subject: Handwritten Digit Recognition (CNN)

-> simple, educational, extendable

If time permits: Handwritten Character Recognition

Extension: Number/Word Recognition, Interactive Application

Relevant bibliography

Neural Networks and Deep Learning (Nielsen, Michael, 2015): http://neuralnetworksanddeeplearning.com/

Saad Albawi, Tareq Abed Mohammed, and Saad Al-Zawi. **Understanding of a convolutional neural network**. In *2017 international conference on engineering and technology (ICET)*, pages 1–6. Ieee, 2017.

Wenfei Liu, Jingcheng Wei, and Qingmin Meng. **Comparisions on knn, svm, bp and the cnn for handwritten digit recognition**. In *2020 IEEE International Conference on Advances in Electrical Engineering and Computer Applications (AEECA)*, pages 587–590. IEEE, 2020.

Keiron O'Shea and Ryan Nash. **An introduction to convolutional neural networks**. *arXiv preprint arXiv:1511.08458*, 2015.

Samay Pashine, Ritik Dixit, and Rishika Kushwah. **Handwritten digit recognition using machine and deep learning algorithms**. *arXiv preprint arXiv:2106.12614*, 2021.

Jianxin Wu. **Introduction to convolutional neural networks**. *National Key Lab for Novel Software Technology. Nanjing University. China*, 5(23):495, 2017.

Relevant bibliography (cont.)

MNIST Dataset: http://yann.lecun.com/exdb/mnist/

NIST Special Dataset 19: https://www.nist.gov/srd/nist-special-database-19

MNIST CNN Walkthrough: https://learner-cares.medium.com/handwritten-digit-recognition-using-convolutional-neural-network-cnn-with-tensorflow-2f444e6c4c31

MNIST CNN Example: https://keras.io/examples/vision/mnist_convnet/

Interactive App: https://github.com/Prajwal10031999/Handwritten-Digit-Recognition-CNN-Flask-App-

Interactive App: https://github.com/nedeljkovignjevic/handwritten-digit-recognition

GitHub Repository

Repository link:

https://github.com/Benjamin-Talbot/Final-Project

Dataset: MNIST and NIST Special Database 19

Thank You!

Questions?