

Kevin's Research Outline

- Researched machine learning and deep learning concepts
- Read detailed descriptions on general neural networks as well as convolutional neural networks (CNNs)
- Performed some classification practice with the Handwritten Digits and Fashion MNIST datasets using different CNN models (i.e. experimenting with different layers)
 - Handwritten Digits
 - * approx 98.4% test accuracy with an Adam-optimized model, using sparse categorical cross-entropy, and consisting of 6 layers: Conv2D (3-by-3 convolution matrix), MaxPooling2D (2-by-2 pooling matrix), Flatten (converts to 1D), Dense (128 output nodes, ReLU activation), Dropout (20% chance of data being dropped), and Dense (10 output nodes, softmax activation)
 - * approx 99.2% test accuracy with an Adadelat-optimized model, using categorical cross-entropy, and consisting of 8 layers: Conv2D (32 output nodes, ReLU activation, 3-by-3 convolution matrix), Conv2D (64 output nodes, ReLU activation, 3-by-3 convolution matrix), MaxPooling2D (2-by-2 pooling matrix), Dropout (25% chance of data being dropped), Flatten, Dense (128 output nodes, ReLU activation), Dropout (50% chance of data being dropped), Dense (10 output nodes, softmax activation)
 - Fashion
 - * approx 90.7% test accuracy with an Adam-optimized model, using categorical crossentropy, and consisting of 10 layers: Conv2D (64 output nodes, ReLU activation, 2-by-2 convolution matrix), MaxPooling2D (2-by-2 pooling matrix), Dropout (30% chance of data being dropped), Conv2D (32 output nodes, ReLU activation, 2-by-2 convolution matrix), MaxPooling2D (2-by-2 pooling matrix), Dropout (30% chance of data being dropped), Flatten(), Dense (64 output nodes, ReLU activation), Dropout(50% chance of data being dropped), Dense (10 output nodes, softmax activation)