About Me

Education
- Florida State University
- Major in Computer Science
- Minor in Physics
- Third Year Rising Senior

Prior Coursework
- Calculus I & II
- Discrete Math I & II
- Linear Algebra
- Statistics
- Data Structures I & II

Concepts Learned
- Pycharm
- Anaconda
- Newton
- Numpy
- Transformers
- TensorFlow
- PyTorch
- Keras
- Convolutional Neural Networks
- Convolutional Neural Networks
Keras Tutorial

MNIST Dataset

Model Parameters
- Batch Size: 1000
- Epochs: 10
- Activation Function: ReLu
- Dropout: 0.5

Confusion Matrix
- Shown on next slide

Test Loss & Accuracy
- Test Loss: 0.091
- Test accuracy: 97.15%

- Kernel Size: (3, 3)
- 2 Conv2D Layers (32, 64)
- Loss Function: Cross Entropy
- Optimizer: Adam
- Learning Rate: 0.0001

![Validation loss history](image)

![Validation accuracy history](image)
## Assignment 1

### CIFAR-100 Image Classification with Keras

<table>
<thead>
<tr>
<th>Model One: Base</th>
<th>Model Two: MNIST</th>
<th>Model Three</th>
<th>Model Four</th>
</tr>
</thead>
<tbody>
<tr>
<td>● 17 Layers</td>
<td>● 11 Layers</td>
<td>● 15 Layers</td>
<td>● 18 Layers</td>
</tr>
<tr>
<td>● Test Loss: 1.841</td>
<td>● Test Loss: 3.409</td>
<td>● Test Loss: 3.143</td>
<td>● Test Loss: 1.296</td>
</tr>
<tr>
<td>● Test Accuracy: 51.6%</td>
<td>● Test Accuracy: 22.1%</td>
<td>● Test Accuracy: 34.8%</td>
<td>● Test Accuracy: 65.1%</td>
</tr>
<tr>
<td>Parameters</td>
<td>Value</td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------------------</td>
<td>------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Batch Size</td>
<td>128</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Architecture</td>
<td>Sequential Model</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Epochs</td>
<td>71</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Learning Rate</td>
<td>0.0001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Optimizer</td>
<td>Adam</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loss Function</td>
<td>Cross Entropy</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Parameters Part II

<table>
<thead>
<tr>
<th>Kernel/Filter Size, Stride, Padding</th>
<th>Activation Function</th>
<th>Size &amp; Number of Fully Connected Layers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kernel/Filter - (3, 3)</td>
<td>ReLu</td>
<td>18 layers</td>
</tr>
<tr>
<td>Stride - N/A</td>
<td></td>
<td>Conv2D: 4 layers of 256, 2 layers of 512</td>
</tr>
<tr>
<td>Padding - “same”</td>
<td></td>
<td>Batch Normalization</td>
</tr>
<tr>
<td>Data Augmentation</td>
<td>Dropout</td>
<td>Total Parameters</td>
</tr>
<tr>
<td>Improved model’s ability to generalize the data set by 5-10%.</td>
<td>0.5</td>
<td>7,526,244</td>
</tr>
</tbody>
</table>
Graph of 18 Layer Model
Assignment 1: Graphs

For the Largest Dataset Size:

- Error Metrics vs. Model Size
- Time Taken vs. Model Size

For the Largest Network Size:

- Error Metrics vs. Dataset Size
- Time Taken vs. Dataset Size

For the Largest Network & Dataset Size:

- Error Metrics vs. Number of Iterations
- Dataset Size vs. Accuracy
PyTorch Mini Assignment

Cifar-10 Dataset

Validation Accuracy History

Validation Loss History

Cifar-100 Dataset

Validation Accuracy History

Validation Loss History
Research Project

Computer Vision System to Assess Building Damages After a Hurricane - Dr. Tanvir Ahmed and Dr. Samiul Hasan

Tasks

- Read up on Provided Literature
  - Post-disaster damage classification based on deep multi-view image fusion.
  - Deep learning for post-hurricane aerial damage assessment of buildings.
- Familiarize self with DoriaNet
  - Read each json file
  - Use the file name to read the image
  - Also extract the label from json and put it in label list
- Plot Distribution and Label Count
Thank you!

Any Questions?