MNIST Handwritten Digit Recognition

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INTRODUCTION TO PROJECT

- Using the MNIST Dataset
- Model ideally looks at pictures of handwritten digits and effectively recognizes them as the correct number
- Use of pre-existing model to establish a baseline
- Goal is to improve model accuracy

TEAM APPROACH & METHODS

- Learning and implementing various techniques to improve model accuracy

- Combining methods to create a new optimized model

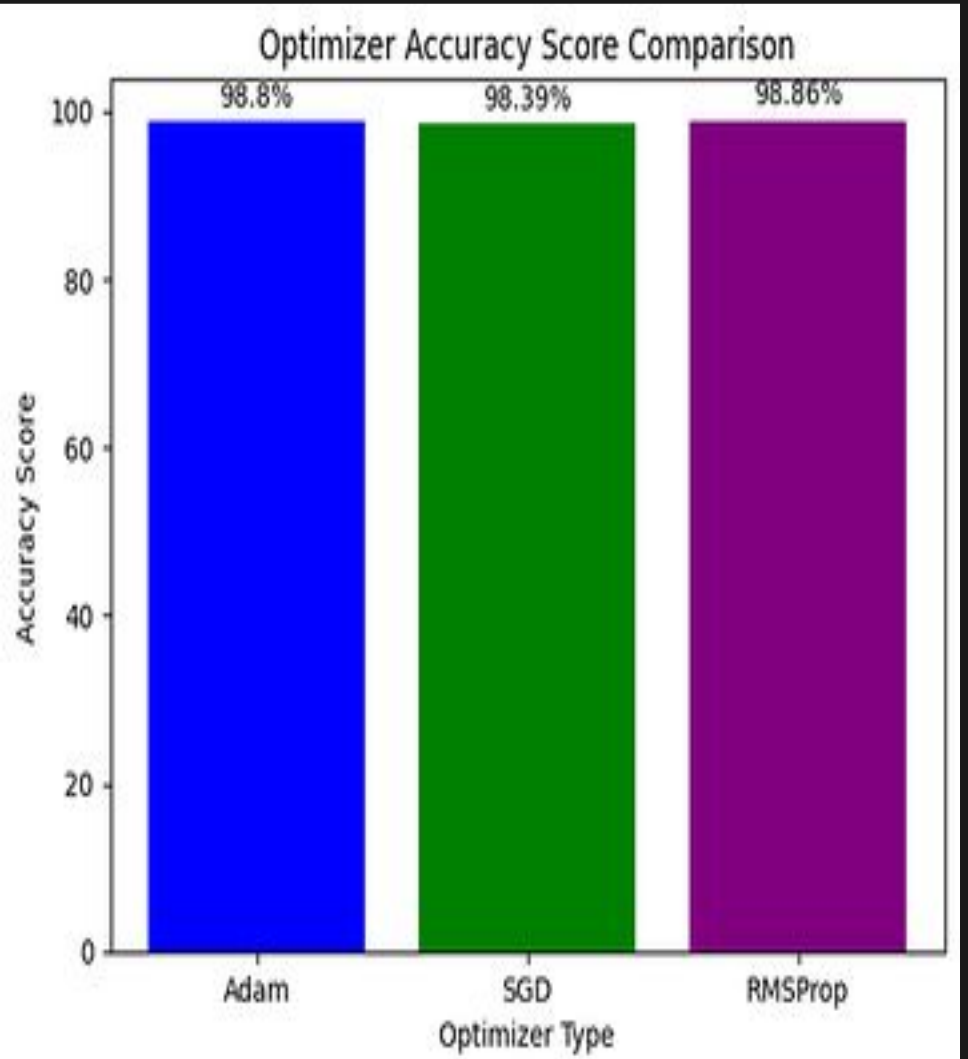
- Overall improved accuracy rate from 95% to almost 99%

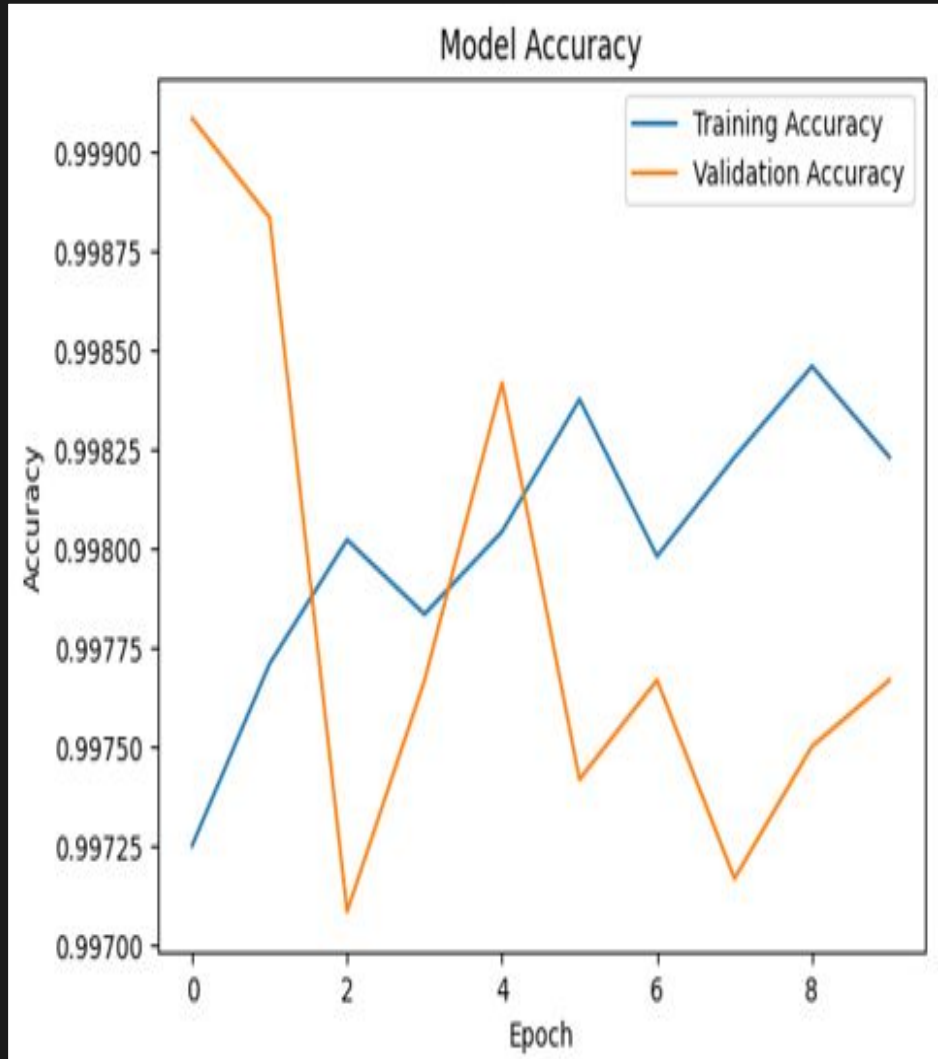
Model improvement

- Setting **strides** parameter of **MaxPooling2D** layer to **(1,1)**.
  - Smaller degree of downsampling
  - Pooling window moves one pixel at a time (in both height and width direction)
  - Capturing more features
- Setting **Dropout** to **0.05**
  - Each neuron has a 5% chance of being turned off during each training epoch
  - More neurons are kept active during training
  - Prevent overfitting the training data

METHODS & TECHNIQUES USED

- # of Epochs
- Batch Size
- Dropout
- GPU / CPU


Optimizer Accuracy Score Comparison
98.8%
98.39%
98.86%
100
80
60
40
20
0
Accuracy Score
Adam
SGD
RMSProp
Optimizer Type


Model Accuracy
Training Accuracy
Validation Accuracy
0.99900
0.99875
0.99850
0.99825
0.99800
0.99775
0.99750
0.99725
0.99700
Accuracy
0
2
4
6
8
Epoch