CSE3CI: Machine Learning

Assignment 2: Report

Student Name: James Worcester

Student Number: 2076 7086

# Task 1: Build a Neural Network WITHOUT Convolutional Layers

**Build a neural network without convolutional layers to do the classification task (hint: you will need the use of dense layers). Then, you can change the model structure (i.e., number of dense layers, number of neurons in dense layers, or activation functions), to be able to improve network performance.**

## Task 1.1, Model 1: Initial Model

### Detailed Description of Model Architecture

### Model Illustration

## Task 1.2, Model 2: Better Accuracy

### Detailed Description of Model Architecture

### Model Illustration

## Task 1.3, In-Depth Discussion on Improvements/Deterioration of NN’s Performance

# Task 2: Build a Neural Network WITH Convolutional Layers

**Build a neural network with the use of convolutional layers (you can decide other layer types you want to include in your network). Then, you can change: the number of convolutional layers, the number of filters, or activation function functions in convolutional layers, to be able to improve network performance.**

## Task 2.1, Model 1: Initial Model

### Detailed Description of Model Architecture

### Model Illustration

## Task 2.2, Model 2: Better Accuracy

### Detailed Description of Model Architecture

### Detailed Description of Optimizers/Learning Rates

### Model Illustration

## Task 2.3, In-Depth Discussion on Improvements/Deterioration of NN’s Performance

# Task 3: Change the type of Optimizer or Learning Rate you applied in the Previous Tasks

**Change the type of optimizer or learning rate that you applied in the previous tasks, and see how these changes can influence model performance (You can keep the final network structure you applied in task 2, and try at least one different optimizer setting).**

## Task 3.1, Changing Optimizer or Learning Rate for Task 1

### Detailed Description of Optimizers/Learning Rates

## Task 3.2, Changing Optimizer or Learning Rate for Task 2

### Detailed Description of Optimizers/Learning Rates

## Task 3.3, In-Depth Discussion on Improvements/Deterioration of NN’s Performance

# Task 4: In-Depth Discussion on Improvements/Deterioration of NN’s Performance Across All Three Tasks

# Task 5: Ranking of Neural Network Performance from All Three Tasks