ML Continuous Integration System

Haocheng Lin

UCL

Author Note

Supervisor: Dr. Daniel Buchan

ML Continuous Integration System

# Aims and Objectives

**Aim**: Create a platform for taking Machine Learning Code and Data as inputs for running automated tests. We will add the ML code into the repository if it passes the benchmark tests.

# Objectives

1. Review and configure the ML pipelines for training.
2. Integrate GitHub to monitor the code changes.
3. Implement a tracking method on the datasets.
4. Any changes to the code will run the ML training pipeline.
5. Optimize for the best ML model by comparing new scores with historical ML models’ scores.
6. Run automated steps (such as sending email or pushing code to servers) when ML benchmarks pass or fail targets.

# Work Plan

July – October: Planning

1. Selected the topic.
2. Conducted research on the ML Continuous Integration System.

October – November: Write-up a preliminary specification outlining my progresses.

November: Design a small-scale prototype with basic functionalities.

November – January: Extend upon the prototype into the full system.

January – February:

1. Design Tests for evaluating each task.
2. Interim report for checking the progress.

February – March: Record a video preview outlining the project.

March: Finalize the Project Report for submission.

# Expected Outcomes

## Minimum Requirements

### Code monitoring

|  |  |
| --- | --- |
| Function | Stage |
| Integrate GitHub to track the code changes. | ✅ |
| Run the ML Code whenever there are new changes made to the repository. | ✅ |

### Configuration

|  |  |
| --- | --- |
| Function | Stage |
| Configure the application via YAML text file | ✅ |

### Execute ML Code

|  |  |
| --- | --- |
| Function | Stage |
| Can run a ML pipeline on the local computer. | ✅ |

### Results Presentation

|  |  |
| --- | --- |
| Function | Stage |
| Present a visualized exhibition of the ML results and its scores via email. | ✅ |

**Downstream tasks**

|  |  |
| --- | --- |
| Function | Stage |
| Allow the user to monitor the changes across several repositories. | ⏳ |

## Perfect Solution

### Code monitoring

|  |  |
| --- | --- |
| Function | Stage |
| Allow the user to monitor the changes across several repositories. | ⏳ |

### Configuration

|  |  |
| --- | --- |
| Function | Stage |
| Provide a GUI application to help with configuring the code. | ⏳ |

### Execute ML Code

|  |  |
| --- | --- |
| Function | Stage |
| Enables running the pipeline on the different computational platforms. | ⏳ |

### Results Presentation

|  |  |
| --- | --- |
| Function | Stage |
| Present the results on a web interface alongside an email for the user. | ⏳ |