Project Charter: Rice Type Classification & Extent Prediction

Project Overview:

The project aims to leverage machine learning and deep learning techniques to predict the type of rice and estimate its extent. It involves data pre-processing, feature engineering, model training, and evaluation using both machine learning and deep learning algorithms.

Project Goals & Objectives:

* Develop accurate models for rice type classification and extent prediction.
* Explore various pre-processing techniques to enhance model performance.
* Evaluate the effectiveness of machine learning and deep learning approaches for the given tasks.
* Provide insights and recommendations based on model performance and analysis.

Project Scope:

* **Data Exploration:** Utilise Python for Exploratory Data Analysis (EDA) to understand the dataset.
* **Pre-processing:** Handle outliers using outlier treatment scheme(s), perform feature engineering, normalisation, and dimensionality reduction.
* **Model Training**: Employ supervised and unsupervised learning techniques.
* **Deep Learning:** Explore deep learning architectures for classification and regression tasks.
* **Model Evaluation:** Assess model performance using metrics such as precision, recall, ROC, AUC, RMSE, and score.
* **Documentation:** Maintain records of models, pipelines, and analysis results.

Stakeholders:

* **Project Sponsor:** Daniel Ihenacho
* **Project Manager:** Daniel Ihenacho
* **Data Scientists:** Daniel Ihenacho
* **Data Analysts:** Daniel Ihenacho
* **Rice Industry Experts:** Food Quality Department
* **End Users:** Rice Companies

Deliverables:

* Exploratory Data Analysis (EDA) Report
* Pre-process Dataset
* Train Machine Learning Models (Classifier and regression algorithms)
* Train Deep Learning Models (Classifier and regression algorithms)
* Model Evaluation Metrics Report
* Document Recommendations and Insights
* Push final project to GitHub repository

Timeline:

* **Project Start Date:** 03/03/2024
* **Project End Date:** 24/03/2024
* **Milestones:**
  + EDA report: 03/03/2024 – 09/03/2024
  + Feature Engineering: 10/03/2024 – 15/03/2024
  + Model Training and Evaluation: 17/03/2024 – 20/03/2024
  + Documentation and Reporting: 21/03/2024 – 23/03/2024
  + Push project to GitHub repository: 21/03/2024 – 24/03/2024

Risks:

* **Insufficient Data Quality:** Addressed through robust pre-processing techniques.
* **Model Overfitting:** Mitigated by cross-validation and grid searching techniques.
* **Computational Resources:** Ensure availability of adequate computing resources for deep learning experiments.

Assumptions:

* Availability of relevant datasets for rice type classification and extent prediction.
* Access to necessary computing resources and software tools.
* Collaboration and communication among project stakeholders.

Constraints:

* Time constraints for model development and evaluation.
* Limitations in data availability and quality.
* Technical challenges in implementing deep learning architectures.

Approval:

This project charter is approved by:

Daniel Ihenacho

Project Sponsor/Manager

03/03/2024