Statement of Work (SOW)

Project Title: Airplane Classification
Date: 07-02-2025
Prepared By: T. Karthik Reddy, P. Sreeja, B. Ritika, V. Vyshali, Y. Pranav, Merajuddin, G. Rohan and A. Sathwika.

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1. Introduction

This Statement of Work (SOW) outlines the objectives, scope, deliverables, and responsibilities for the "Airplane Classification using Yolov8, Yolov11, and Multi-Modal Classification Performances" project. This project aims to classify aerial objects into four categories: civilian aircraft, military aircraft, drones, and unidentified flying objects (UFOs). Initially, we are working with 60,000 images for each class, totaling 240,000 images, to train and evaluate our models. The project involves gaining in-depth knowledge of the YOLOv8 and YOLOv11 algorithms, including their parameters and performance optimization techniques. Additionally, we will explore the impact of multi-modal data on classification accuracy.

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2. Scope of Work

Project Description:

The project involves training and evaluating YOLOv8 and YOLOv11 models for airplane classification. Additionally, multi-modal classification approaches will be explored by integrating data from various sources such as RGB images.

Objectives:

1. Implement and compare YOLOv8 and YOLOv11 for airplane classification.
2. Analyze the impact of multi-modal data on classification performance.
3. Optimize model performance and evaluate metrics such as accuracy, precision, recall, and F1-score.
4. Develop a comparative study on the strengths and limitations of YOLO-based and multi-modal classification approaches.

Key Activities:

1. Prioritizing key objectives.
2. Data collection and preprocessing.
3. Studying YOLOv8 and YOLOv11 models.
4. Implementing the models.
5. Integrating multi-modal data sources for classification.
6. Training and evaluation of models.
7. Performance comparison and fine-tuning the models.
8. Documentation and usage of software tools learned in the labs.

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3. Deliverables

- **Deliverable 1:** Data collection and preprocessing report (Due: 07-02-25)
- **Deliverable 2:** Learning algorithms (Yolov8) and model training (Due: 02-03-25)
- **Deliverable 3:** Parameter tuning and Multi-modal classification performance analysis report (Due: 30-03-25)
- **Deliverable 4:** Final project documentation and presentation (Due: 28-04-25)

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4. Timeline and Milestones

Provide a high-level timeline with key milestones.

Milestone	Description	Due Date
Dataset Preparation	Data collection and preprocessing	07-02-25
Model Training	Learning algorithms, model training, and parameter tuning	02-03-25
Multi-Modal Evaluation	Integration of multi-modal data sources and performance evaluation	30-03-25

Milestone	Description	Due Date
Final Review and Documentation	Comprehensive analysis, fine-tuning, documentation, and presentation	28-04-25

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5. Roles and Responsibilities

- Outline the key roles and their responsibilities within the project.
  Team Members: T. Karthik Reddy - Dataset Preparation & Backend, P. Sreeja - Dataset Preparation & Multi-modal data on classification, B. Ritika - Model Finetuning, V. Vyshali - Model Training, Y. Pranav - Yolov8 & Yolov11, Merajuddin - multi-modal data on classification , G. Rohan - Documentation and Performance evaluation A. Sathwika - Documentation and model tuning.
- Client Contact: Software Engineering course, Mahindra University

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6. Budget and Payment Terms (For now you can ignore this)

~~Detail the project budget, including payment schedules, terms, and conditions.~~

- ~~**Total Budget:** [Insert Amount]~~
- ~~**Payment Schedule:** [Insert payment milestones and dates]~~
- ~~**Terms:** [Insert any special payment terms]~~

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7. Assumptions and Constraints

Assumptions:

- Availability of necessary datasets for training and testing.
- Access to sufficient computational resources (GPU, cloud services, etc.).
- Proper documentation and research papers for reference.

Constraints:

- Computational limitations might impact the training time.
- Data availability and preprocessing challenges.
- Time constraints due to course deadlines.

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8. Approval Signatures

Client:

Name: _____Classifiers_____

Title: _____Airplane Classification_____

Signature: _____

Date: _____07-02-2025_____

Service Provider:

Name: _____

Title: _____

Signature: _____

Date: _____