

AI Class Project: Research, Code, and Paper Submission

Project Title

Exploring an AI Algorithm on a Unique Dataset

Overview

This project will provide hands-on experience in applying an AI algorithm to a unique dataset. Over two days, you will conduct research, write code, analyze your findings, and package everything into a concise paper. You are expected to describe the algorithm you selected, explain the code used, and discuss the results and insights derived from your analysis. The project is structured into four phases over two days, with a single final deliverable: a well-organized paper that integrates your research, code, and results.

Project Structure

Day 1

Morning (Research and Dataset Selection)

1. Research AI algorithms and their applications. Choose one algorithm that you are either comfortable with or eager to explore.
2. Identify a unique dataset (do **not** use common datasets such as Iris or similar). The dataset should be relevant to the AI technique you selected and manageable within the two-day project timeframe. You may source datasets from platforms like Kaggle, the UCI Machine Learning Repository, or other open data sources.
3. In your paper, provide a brief introduction to the AI algorithm and the dataset you selected, explaining why this algorithm fits the data.

Afternoon (Algorithm Implementation - Writing Code)

1. Write code to implement your chosen AI algorithm on the dataset. Python libraries such as `scikit-learn`, `TensorFlow`, or `PyTorch` can be used, but make sure you understand the algorithm and can explain it.

2. Test and tune your model as necessary. Focus on understanding the process rather than perfecting the results.
3. In the paper, include a section where you explain the major functions and logic of your code.

Day 2

Morning (Analysis and Discussion)

1. Analyze the output of your AI model. Create visualizations or metrics to support your findings (e.g., confusion matrix, accuracy, loss, etc.).
2. Reflect on the performance of the algorithm. Did the dataset present any unique challenges? Were the results as expected? Include this analysis in your paper with concrete examples.
3. Write the *Results* section of your paper, explaining what happened when you applied the algorithm to the dataset.

Afternoon (Writing and Submission)

1. Finalize your paper. Structure it into the following sections: **Introduction**, **Methodology** (dataset and algorithm), **Code Explanation**, **Results**, and **Conclusion**. Ensure all code and key results are well-integrated into the paper, with proper citations.
2. The paper should be 4-6 pages long, including visualizations and code snippets, and must be clear and concise.
3. Submit the final paper by the end of the day.

Reminders

- Do **not** use overly common datasets such as Iris, Titanic, or MNIST. The objective is to practice applying AI techniques to a dataset that is less widely used, allowing for exploration of unique challenges and insights.
- Focus on understanding the process and learning from it rather than obtaining perfect results.

Deliverable

- One paper that includes the following sections:
 1. **Introduction**: A brief introduction to the algorithm and dataset.
 2. **Methodology**: Explanation of the AI algorithm and dataset.

3. **Code Explanation:** Include and explain key parts of your code.
4. **Results:** Analysis and discussion of the results.
5. **Conclusion:** Summary of findings and reflections.

Grading Criteria

- **Clarity and Organization:** Is the paper well-structured and easy to follow?
- **Depth of Research:** Does the paper show a clear understanding of the AI algorithm?
- **Implementation and Code:** Is the code correctly implemented and well-explained?
- **Analysis and Discussion:** Are the results critically analyzed, and do they reflect thoughtful engagement with the project?