**Project Management Plan (PMP)**

Project Title: Classifying MR Images and Detecting Tumors using ANNs in Image Processing, and The Contribution of Ensemble Techniques to Accuracy Rate

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1. **Project Scope**

• This project aims to achieve absolute accuracy in tumor detection by utilizing Artificial Neural Network (ANN) models for image classification.

The project focuses on the classification of MR images and aims to enhance the accuracy of ANN models using ensemble techniques.

1. **Project Objectives:**

• The main objectives of this project include:

• Classifying MR images using artificial neural networks.

• Investigating the impact of ensemble techniques on accuracy rates.

1. **Literature Research:**

• Research for this project should encompass topics such as how MR images are examined in the medical field, MR image classification, optimization of artificial neural networks, and ensemble techniques.

1. **Project Constraints:**

• Time, the duration spent on training models.

• Data set, the need for a high-quality and functional dataset suitable for models and the project.

• A system with at least 8 GB of RAM and a minimum 2.7 GHz Intel Core i5 processor.

• Software requirements include Python 3.11 and/or later.

1. **Project Organization:**

• There are two people involved in this project: a developer and an analyst.

• Project Leader and Developer: Şükrü Bora Karakuş

• Data Specialist and Analyst: İsmail Eza

• Şükrü Bora Karakuş is responsible for tasks such as creating and training models and examining metric values, İsmail Eza is responsible for the procurement and preparation of the dataset and displaying metric values.

1. **Stakeholder List**

• In this project, there are only two stakeholders, a developer, and an analyst.

1. **Project Life Cycle and SDLC Model**

7.1 Requirement Analysis Phase:

7.1.1.Objective

• To comprehensively identify and make understandable all requirements for the project.

7.1.2.Activities

• Investigating real-life examples to research what is needed.

• Creating requirement documents.

7.2. Feasibility Study Phase:

7.2.1.Objective

• Evaluating the technical and strategic feasibility and constraints of the project.

7.2.2.Activities

• Assessing technical and operational risks considering constraints.

• Providing technical documentation and technical support sources for the project.

7.3. Design Phase:

7.3.1.Objective

• Determining the technical structure and design of the project.

7.3.2Activities

• Examining the designs of Artificial Neural Network models.

• Creating a plan for Ensemble techniques.

7.4. Coding Phase

7.4.1.Objective

• Implementing the designed models and techniques.

7.4.2.Activities

• Creating and training Artificial Neural Network models.

• Implementing and coding Ensemble techniques.

7.5.Testing Phase

7.5.1.Objective

• Testing the accuracy of trained models and techniques.

7.5.2.Activities

• Testing accuracy on test datasets.

• Analyzing metric data and making error corrections.

7.6. Installation/Deployment Phase

7.6.1Objective

• (If desired) Moving the project to a live environment.

7.6.2. Activities

• Making developed models ready to be moved live in .h5 format.

7.7. Maintenance Phase

7.7.1.Objective

• (If desired) Addressing potential errors in the live environment and adding new features when necessary.

7.7.2.Activities

• (If desired) Updating models for compatibility with new datasets.

1. **Project Milestones**

* Requirements Analysis (2 Weeks)
* Feasibility Study (1 Week)
* Design Phase (3 Weeks)
* Implementation (Coding) (4 Weeks)
* Testing and Validation (2 Weeks)
* Documentation and Reporting (Throughout the Project)

1. **Project Methodologies and Standards**

9.1.Methodologies

* Artificial Neural Network (ANN) Development:
* Train Artificial Neural Networks tailored to models and objectives.
* Implement the best deep learning models for optimal and high accuracy rates.

9.1.1Application of Ensemble Technique:

* Systematically apply ensemble methods to increase accuracy rates.

9.2.Standards

9.2.1.Coding Standards

* Adhere to specific standards for code readability and reusability.
* Follow naming conventions for understandable documentation.

9.2.2.Real-World Compliance

* Ensure compliance with relevant medical data and standards.

9.2.3.Aim to Improve Accuracy

* Regularly test and evaluate applied techniques for model accuracy.

9.2.4.Continuous Improvement

* Continuously enhance and research until the accuracy rate approaches the desired levels.

9.3.Documentation

* Implement reporting processes cleanly and comprehensively.
* Provide detailed documentation for models, methodologies, and results.

1. **Work Breakdown Structure (WBS)** If you can’t see -> [diagram on the web](https://t.ly/D_p-g)
   1. Development and Analysis
   2. Introduction the Project and Setting objectives.
   3. Literature Review and Requirement Analysis
      1. Literature Review (Real World Research)
      2. Requirement Analysis
      3. Feasibility Study
   4. Design
      1. Selection of ANN Models
      2. Planning of Ensemble Techniques
   5. Implementation
      1. Creation and Training of ANN Models
      2. Implementation and Optimization of Ensemble Techniques.
   6. Testing
      1. Testing the accuracy of Models
      2. Examination of Metric Values.
2. Reporting
   1. Prepare Documents of projects
   2. Visualize metrics
3. Review and Project Closure
   1. Code Review
      1. Code Review for ANN Models
      2. Code Review for ensemble techniques
   2. Performance Testing
      1. Performance Testing of Models

metin, diyagram, paralel, plan içeren bir resim

Açıklama otomatik olarak oluşturuldu

1. **Project Schedule**

metin, ekran görüntüsü, sayı, numara, yazı tipi içeren bir resim

Açıklama otomatik olarak oluşturuldu

1. **Budget and Cost Management Plan**

* Financially, only the hardware and software needs specified in the 4th item are necessary for this project.

1. **Closure Criteria**

• Successfully training all Artificial Neural Network (ANN) models with high accuracy rates.

• Successful implementation and testing of ensemble techniques.

• Achieving better success rates with models developed using ensemble techniques compared to models without ensemble.

• Recording the project progress, documenting individual success rates of each model, and noting any issues encountered.

• Creating comprehensive and understandable project documentation.

• Ensuring that models meet the success criteria defined during the testing phase.

• Metric values reaching or closely approaching the desired thresholds.

1. **References**

* <https://www.guru99.com/software-development-life-cycle-tutorial.html>
* h[ttps://www.lucidchart.com/pages/examples/work-breakdown-structure-software](https://www.lucidchart.com/pages/examples/work-breakdown-structure-software)
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