

PANIC DISORDER DETECTION

1: Project Initialization and Planning Phase

The “project initialization phase” for Panic Disorder Detection involves defining the project's scope, goals, and stakeholders. Key deliverables include identifying the tools and technology for data collection, such as wearable devices or surveys. In the ****planning phase****, the focus shifts to creating a timeline, allocating resources, and selecting machine learning or diagnostic models. A detailed risk management plan and ethical considerations for handling sensitive health data are also outlined. Finally, milestones for data acquisition, model development, and testing are established.

Activity 1: Define Problem Statement

"Panic disorder is often underdiagnosed or misdiagnosed due to its episodic nature and overlapping symptoms with other mental health conditions. This project aims to develop an accurate and timely detection system that can identify early signs of panic disorder using data-driven methods, such as physiological signals and behavioral patterns. The goal is to enhance early diagnosis, improve treatment outcomes, and reduce the impact of the disorder on individuals' daily lives."

Panic disorder detection Problem Statement Report: [Click Here](#)

Activity 2: Project Proposal (Proposed Solution)

This project aims to develop a system that detects panic disorder by analyzing physiological data (e.g., heart rate, breathing patterns) and behavioral signals using machine learning. The objective is to create a reliable tool for early diagnosis and intervention, improving treatment outcomes for individuals. The methodology includes data collection via wearables, model development, testing, and real-world implementation. The expected outcome is an accessible and accurate detection system for healthcare professionals and individuals.

Panic disorder detection Project Proposal Report: [Click Here](#)

Activity 3: Initial Project Planning

The initial project planning for the “Panic Disorder Detection” system involves defining the scope and goals, which focus on developing a tool for early diagnosis and intervention using physiological and behavioral data. Key stakeholders, including healthcare professionals, data scientists, and patients, will be identified to ensure the project aligns with user needs. Resources such as wearable sensors, machine learning tools, and skilled personnel will be allocated to carry out the project efficiently. A 6-month timeline will be established, covering phases such as design, data collection, model development, testing, and deployment. To mitigate potential risks, including data privacy concerns and model accuracy, a risk management plan will be implemented. Success metrics, such as detection accuracy and user satisfaction, will be defined to measure the effectiveness of the project upon completion.

Panic disorder detection Project Planning Report: [Click Here](#)

Milestone 2: Data Collection and Preprocessing Phase

The ****data collection and preprocessing phase**** focuses on gathering physiological data, such as heart rate, skin conductance, and breathing patterns, through wearable sensors and surveys to capture behavioral patterns related to panic disorder. This raw data is then cleaned and processed to remove noise, inconsistencies, and outliers, ensuring it is accurate and reliable for analysis. Key steps include normalizing the data, handling missing values, and transforming it into a structured format suitable for machine learning models. This phase ensures high-quality input data, which is essential for effective model training and improving the system’s accuracy. Properly preprocessed data lays the foundation for successful detection and prediction of panic disorder symptoms.

Activity 1: Data Collection Plan, Raw Data Sources Identified, Data Quality Report

The ****Data Collection Plan**** involves acquiring physiological data from wearable devices (e.g., heart rate monitors) and behavioral data through user surveys. Identified raw data sources include sensor readings from wearables, medical records, and user-reported symptoms. A ****Data Quality Report**** will assess the completeness, accuracy, and

consistency of the collected data, ensuring that noise and outliers are managed. This will ensure that the dataset is clean, reliable, and ready for model development.

Panic disorder detection Data Collection Report: [Click Here](#)

Activity 2: Data Quality Report

The ****Data Quality Report**** evaluates the accuracy, completeness, and consistency of the collected data, identifying and addressing any errors, missing values, or inconsistencies. This ensures the dataset is reliable and suitable for machine learning model development..

Panic disorder detection Data Quality Report: [Click Here](#)

Activity 3: Data Exploration and Preprocessing

****Data Exploration**** involves analyzing the collected data to identify patterns, trends, and any anomalies or missing values. During ****Preprocessing****, the data is cleaned, normalized, and transformed into a structured format, ensuring it is ready for machine learning model training. This step improves data quality and ensures accurate results in the detection system.

Panic disorder detection Data Exploration and Preprocessing Report: [Click Here](#)

Milestone 3: Model Development Phase

The ****Model Development Phase**** focuses on selecting and implementing appropriate machine learning algorithms to detect panic disorder symptoms from the processed data. This includes training models using techniques such as decision trees, neural networks, or support vector machines, followed by hyperparameter tuning for optimal performance. The phase concludes with initial testing to evaluate model accuracy and effectiveness in identifying panic disorder patterns.

Activity 1: Feature Selection Report

The ****Feature Selection Report**** identifies the most relevant variables from the dataset that significantly contribute to predicting panic disorder symptoms, enhancing model performance and reducing complexity.

Panic disorder detection Feature Selection Report: [Click Here](#)

Activity 2: Model Selection Report

The ****Model Selection Report**** evaluates various machine learning algorithms based on performance metrics such as accuracy, precision, and recall in detecting panic disorder symptoms. It recommends the best-performing model, supported by comparative analysis and validation results, ensuring it meets the project's objectives.

Panic disorder detection Model Selection Report: [Click Here](#)

Activity 3: Initial Model Training Code, Model Validation and Evaluation Report

The ****Initial Model Training Code**** implements the selected algorithm on the training dataset, optimizing parameters and assessing performance metrics during training. The ****Model Validation and Evaluation Report**** summarizes the results, highlighting the model's accuracy, sensitivity, and specificity on validation data, ensuring its reliability for detecting panic disorder.

Panic disorder detection Model Development Phase Template: [Click Here](#)

Milestone 4: Model Optimization and Tuning Phase

The ****Model Optimization and Tuning Phase**** focuses on refining the selected machine learning model by adjusting hyperparameters and applying techniques such as

crossvalidation to enhance performance. This process aims to minimize overfitting and improve accuracy, ensuring the model generalizes well to new, unseen data.

Activity 1: Hyperparameter Tuning Documentation

The ****Hyperparameter Tuning Documentation**** outlines the specific hyperparameters adjusted during the optimization process, including their ranges and selected values. It also details the tuning methods used, such as grid search or random search, and summarizes the impact of these adjustments on the model's performance metrics.

Activity 2: Performance Metrics Comparison Report

The ****Performance Metrics Comparison Report**** presents a detailed analysis of various models evaluated during the selection phase, comparing key metrics such as accuracy, precision, recall, and F1-score. This report highlights the strengths and weaknesses of each model, guiding the final selection for panic disorder detection.

Activity 3: Final Model Selection Justification

The ****Final Model Selection Justification**** outlines the rationale for choosing the specific machine learning model based on its superior performance metrics, including high accuracy and recall in detecting panic disorder symptoms. It emphasizes the model's ability to generalize well on validation data and its robustness against overfitting. Additionally, the selected model aligns with project goals, offering a balance between complexity and interpretability for healthcare applications.

Panic disorder detection Model Optimization and Tuning Phase Report: [Click Here](#)

Milestone 5: Project Files Submission and Documentation

For project file submission in Github, Kindly click the link and refer to the flow. [Click Here](#)

For the documentation, Kindly refer to the link. [Click Here](#)

Milestone 6: Project Demonstration

In the upcoming module called Project Demonstration, individuals will be required to record a video by sharing their screens. They will need to explain their project and demonstrate its execution during the presentation.