



## Department of Computer Science

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University of Gujrat

### *EnviroCast: Smart Environment Monitoring System*

#### Submitted By:

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## DECLARATION

I certify that project title \_\_\_\_\_  
is under my supervision with students of \_\_\_\_\_,  
Faculty of Computing & Information Technology, University of Gujrat, Pakistan, worked  
under my supervision.

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Dated: \_\_\_\_\_

# FINAL YEAR PROJECT PROPOSAL

## ***Abstract***

This proposal presents "EnviroCast: Smart Environment Monitoring," a comprehensive system designed to monitor and forecast various environmental parameters such as temperature, humidity, air quality index (AQI), and particulate matter. The project combines cutting-edge sensor technology, data processing, and machine learning techniques to provide real-time insights and predictive analytics for environmental conditions. It outlines the system's background, key modules, advantages, and potential challenges, discussing the tools and technologies to be employed and future enhancement directions.

## ***1. Introduction***

This proposal aims to develop and present a final year project outlining a comprehensive system for real-time monitoring and forecasting of environmental parameters. It defines functional and non-functional requirements, scopes the project's timeline, and highlights the methods, tools, and platforms to be utilized.

## ***2. Project Title:***

EnviroCast: Smart Environment Monitoring System

## ***3. Project Overview statement:***

The advancement of smart technologies is crucial in addressing environmental concerns. The proposed "EnviroCast" system aims to offer real-time monitoring and predictive analytics for parameters like temperature, humidity, AQI, and particulate matter. By integrating advanced sensors, machine learning algorithms, and user-friendly interfaces, the project seeks to provide insights into conditions for various applications. This proposal contextualizes the project, introduces core modules, discusses potential advantages and drawbacks, and outlines pathways for future advancements.

## ***4. Targeted Audience:***

"EnviroCast" caters to a diverse audience including urban planners, environmental agencies, and individuals interested in maintaining optimal conditions for health, planning, and decision-making.

## ***5. Project Goals & Objectives:***

Goals:

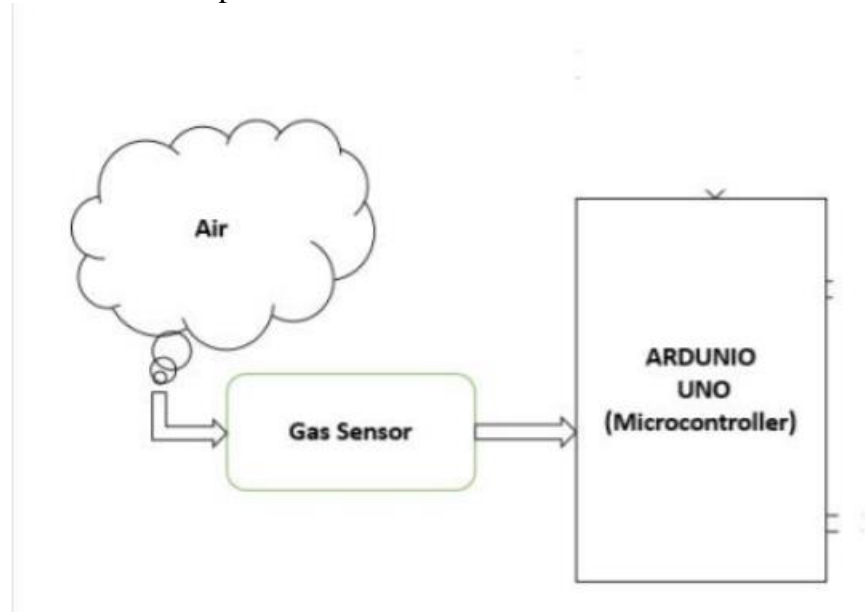
- Develop a comprehensive environment monitoring and forecasting system.
- Provide accurate real-time data on environmental parameters.
- Implement machine learning models for predictive analytics.

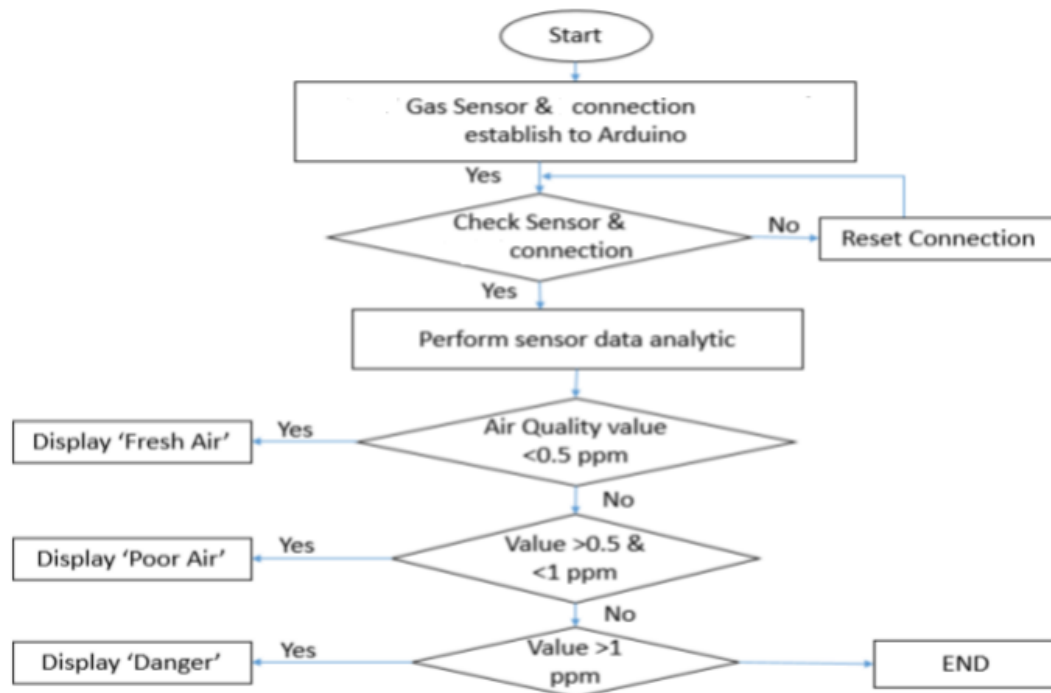
Objectives:

- Integrate sensor hardware for seamless data collection.
- Process and preprocess sensor data to derive meaningful insights.
- Implement machine learning algorithms for predictive modeling.
- Design an intuitive interface for data visualization and user interaction.
- Evaluate and refine models for accuracy and reliability.

## ***6. Application Architecture:***

The system requires sensors for temperature, humidity, AQI measurement, and particulate matter. The Flutter framework will be used for mobile application development, Python for machine learning, data processing, and analysis. The system will operate on an Arduino platform.





## 7. Hardware and Software Specification:

Hardware:

- IoT sensors (e.g., particulate matter sensors)

Software:

- Python
- Jupyter Notebook
- IoT platforms (e.g., Arduino, Raspberry Pi)
- Machine Learning libraries (e.g., scikit-learn)

## 8. Estimated Cost:

- IoT sensors: PKR 35,000
- Development hardware and software: PKR 10,000
- Miscellaneous expenses: PKR 5,000
- Total Estimated Cost: PKR 50,000

## 9. Tools and technologies used with reasoning:

- Arduino for data collection
- Various sensors for temperature, humidity, AQI measurement.
- Flutter framework for mobile application development.
- Python for machine learning, data processing, and analysis.
- Git for version control and collaboration.

## 10. Project milestones and deliverables

- Sensor integration and data collection setup.
- Data preprocessing and feature extraction.
- Machine learning model development for prediction.
- Mobile application design and implementation.
- Model evaluation and refinement.
- System testing, documentation, and final deliverables.

Gantt Chart:

Tasks	Week 1-3	Week 4-12	Week 13-16	Week 17-25	Week 26-28	Week 29-30
Milestone 1	Sensor Integration and Data Collection Setup					
Milestone 2		Data Preprocessing and Feature Extraction				
Milestone 3			Model Development			
Milestone 4				Mobile Application Design and Implementation		
Milestone 5					Model Evaluation and Refinement	
Milestone 6						System Testing, Documentation and Final Deliverables

## 11. Work division among Group members

The division of responsibilities among the team members is outlined as follows:

- **Sheraz Ahmed:**
  - Role: Sensor Integration and Data Preprocessing
  - Integrate sensors into the system.
  - Ensure proper hardware connectivity and communication.
  - Develop code for real-time data collection and preprocessing.
- **Hassan Tahir:**
  - Role: Machine Learning Model Development
  - Research and develop machine learning models for parameter prediction.
  - Train and fine-tune models using collected sensor data.
  - Implement model evaluation metrics.

- **Meerab Irfan:**

- Role: Mobile Application Design and Development
- Design the mobile application interface for data visualization.
- Integrate sensor data and predictions into the mobile app.
- Develop user-friendly controls for user interaction.

By distributing responsibilities based on strengths and skills, the team aims to ensure efficient progress and successful completion of the "EnviroCast: Smart Environment Monitoring" project. Collaboration among team members will be maintained for a seamless integration of all components.