Wireframe Documentation

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1. Introduction

This document provides a detailed explanation of the wireframe designed for Intelligent IoT Data Management.

2. Purpose of the Wireframe

The wireframe illustrates the layout and flow for users to upload, process, visualize, and analyze IoT time-series data. It focuses on usability, performance, and seamless integration of core features such as time selection, stream selection, normalization, anomaly detection, correlation analysis, and visualization.

3. Page Overview

3.1 Dashboard View

Sections:

- Header Bar:
    - Title: “Intelligent IoT Data Management”
    - Logo and navigation panel
- Upload Panel:
    - Buttons to upload CSV/JSON files
    - Preview pane showing first 10 rows
    - Error messages for invalid formats
- Time Frame Selector:
    - Start and End Time input fields
    - Slider to choose time window
    - Button: “Apply Window”
- Data Stream Selector:
    - Checkbox list of detected streams
    - Minimum of two selections required
    - Dynamic updates on selection

- Normalization Panel:
    - Toggle for “Min-Max Normalization”
    - Checkbox for handling missing values and outliers
    - Button: “Normalize”
- Anomaly Detection Section:
    - Dropdown menu with algorithms: Z-score, MAD, Isolation Forest
    - Button: “Run Detection”
    - Output: Table of detected anomalies
- Correlation Analysis Panel:
    - Button: “Run Correlation”
    - Output: Heatmap, Correlation Line Graphs
    - Auto-refresh on stream/window update
- Visualization Panel:
    - Interactive plots using Plotly
    - Options: Line, Bar, Area
    - Download buttons: PNG, SVG
    - Annotations toggle

4. User Flow Description

1. Upload Data → Preview Display → Time and Stream auto-detection
2. Select Time Window → Segment data → Preview segmented outputs
3. Choose Streams → At least 2 for correlation
4. Apply Normalization → Prepare data for analysis
5. Run Anomaly Detection → Visual + Tabular output
6. Perform Correlation Analysis → Visual correlation matrices
7. Explore Visualizations → Download or annotate plots

5. Conclusion

The wireframe is aligned with the functional requirements of the project and represents a user-centered interface for conducting data science operations on IoT datasets. It provides intuitive navigation and a responsive, real-time analysis experience for users.