

Data Flow Diagram (DFD)

Electric Motor Temperature Prediction using Machine Learning

1. Introduction

This document describes the Data Flow Diagram (DFD) for an Electric Motor Temperature Prediction system using Machine Learning. The system predicts motor temperature based on real-time sensor data such as voltage, current, speed, torque, and ambient temperature.

2. Level 0 DFD (Context Diagram)

- External Entity: Sensor System (provides real-time motor data)
- Process: ML Temperature Prediction System
- Output: Predicted Motor Temperature
- Data Storage: Historical Motor Dataset

3. Level 1 DFD (Detailed View)

- 1. Data Collection: Sensors collect voltage, current, speed, torque, ambient temperature.
- 2. Data Preprocessing: Cleaning, normalization, handling missing values.
- 3. Feature Engineering: Feature selection and transformation.
- 4. ML Model Training: Train regression model using historical dataset.
- 5. Model Evaluation: Validate model accuracy using test data.
- 6. Prediction Module: Generate real-time motor temperature prediction.
- 7. Data Storage: Store predictions and updated sensor data.

4. Data Flow Description

Sensor Data → Data Collection Module → Preprocessing Module → Feature Engineering → ML Model → Temperature Prediction Output → Database Storage

5. Conclusion

The Data Flow Diagram provides a clear representation of how data moves through the electric motor temperature prediction system. It helps in understanding system architecture, data processing steps, and model integration for accurate temperature prediction.