

# 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.