

NAAN MUDHALVAN PROJECT FILE FOR PHASE 2:

PROJECT NAME: SMART WATER MANAGEMENT

PREDICTIVE MAINTENANCE ALGORITHM:

Predictive maintenance algorithms for smart water management involve using data from sensors and equipment to predict when maintenance is needed to prevent failures or inefficiencies. Here are some key steps and algorithms commonly used:

Data Collection: Install sensors on water infrastructure components such as pumps, valves, and pipes to continuously collect data on their performance.

Data Preprocessing: Clean, preprocess, and aggregate the collected data to remove noise and anomalies, ensuring high-quality input for the algorithms.

Predictive Modeling:

- a. Regression Analysis: Use regression models to predict equipment performance based on historical data.
- b. Machine Learning: Employ machine learning algorithms like Random Forest, Support Vector Machines, or Gradient Boosting for more complex predictions.
- c. Neural Networks: Deep learning models, like recurrent neural networks (RNNs) or long short-term memory (LSTM) networks, can capture temporal patterns in data.

Threshold Monitoring: Set thresholds for various parameters (e.g., pressure, flow rate) and trigger maintenance when these thresholds are exceeded or not met.

MACHINE LEARNING ALGORITHMS:

It plays a crucial role in smart water management by processing data from sensors and making predictions or optimization. They are;

- 1.Linear regression
- 2.Decision trees
- 3.Random forest
- 4.Support vector machines
- 5.K means clustering
- 6.Neural network
- 7.Optimizations algorithms
- 8.Graph algorithms
- 9.Bayesian networks

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