# *WATER QUALITY MONITORING SYSTEM USING RASPBERRY PI*

## MPMC PROJECT


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# OBJECTIVE

- The objective of this project is to estimate the '**potability**' of water using a raspberry pi.
- The **potability** ie. drinkability of water is determined by various factors like
  - pH
  - TDS(Total Dissolved Solids)
  - Conductivity
  - Turbidity
- The above characteristics will be measured by various sensors interfaced with a raspberry pi and sent to the cloud where a machine learning model trained on this data will predict whether the water is potable or not.

# *HARDWARE AND SOFTWARE REQUIRED*

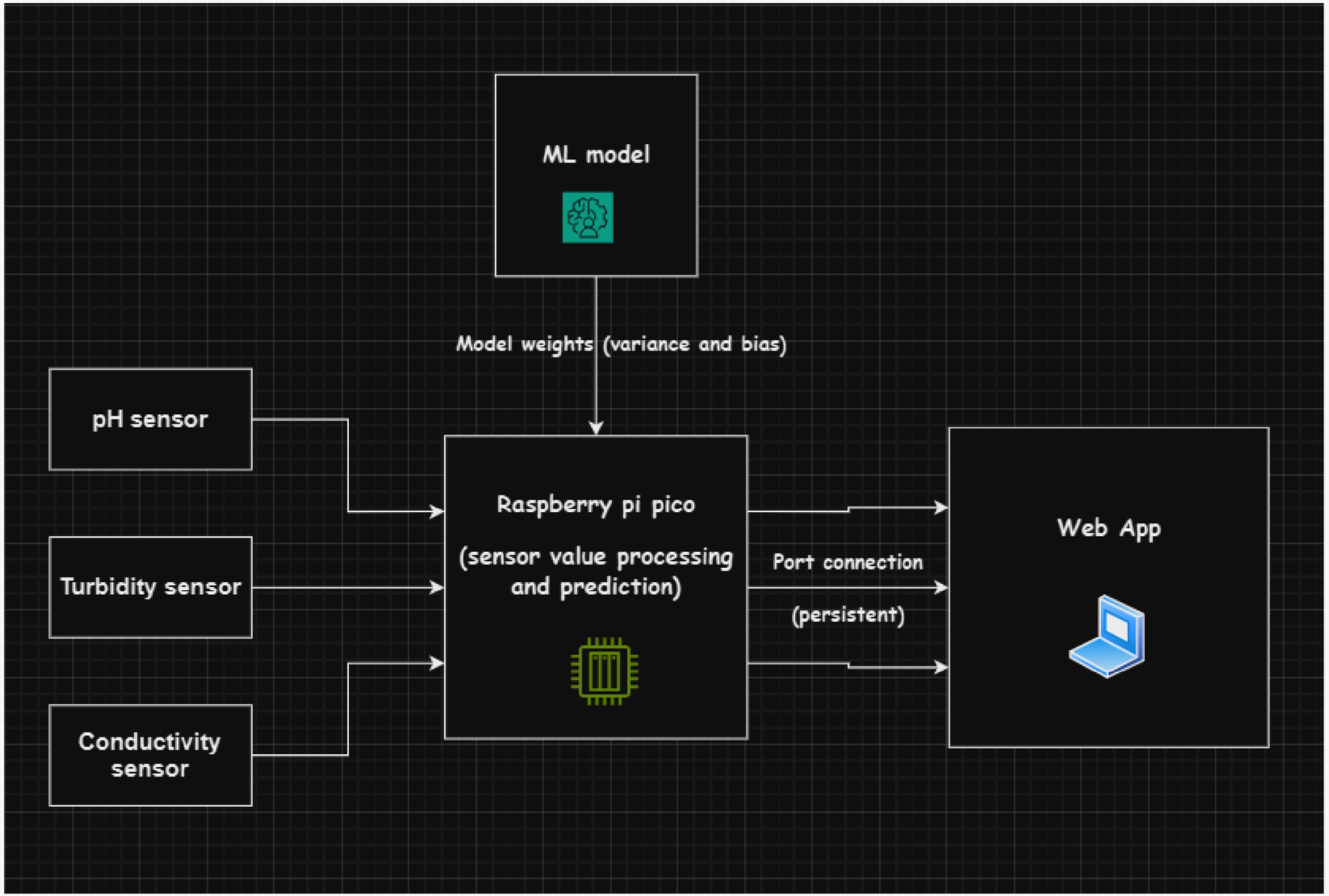
**HARDWARE :**

- pH sensor - KPE-103
- TDS Water conductivity sensor - CLS15D
- Turbidity sensor - SEN0189
- ADS1115 - 16 bit ADC

**SOFTWARE :**

- Raspberry Pi
- Micropython

# BLOCK DIAGRAM



# WORK FLOW

### Interfacing with Raspberry Pi

Connect all the sensors to a 16-bit AD, which is in turn connected to the Raspberry Pi.

### Model training

Use a pre-existing dataset to train the model to predict the potablity of water given the data collected from the sensors


### Data Collection

Use various sensors mentioned in the previous slide to collect necessary data that is required to classify the portability of water

### Data processing

Process the data stored in the cloud with necessary cleaning techniques and make it ready to feed into the model

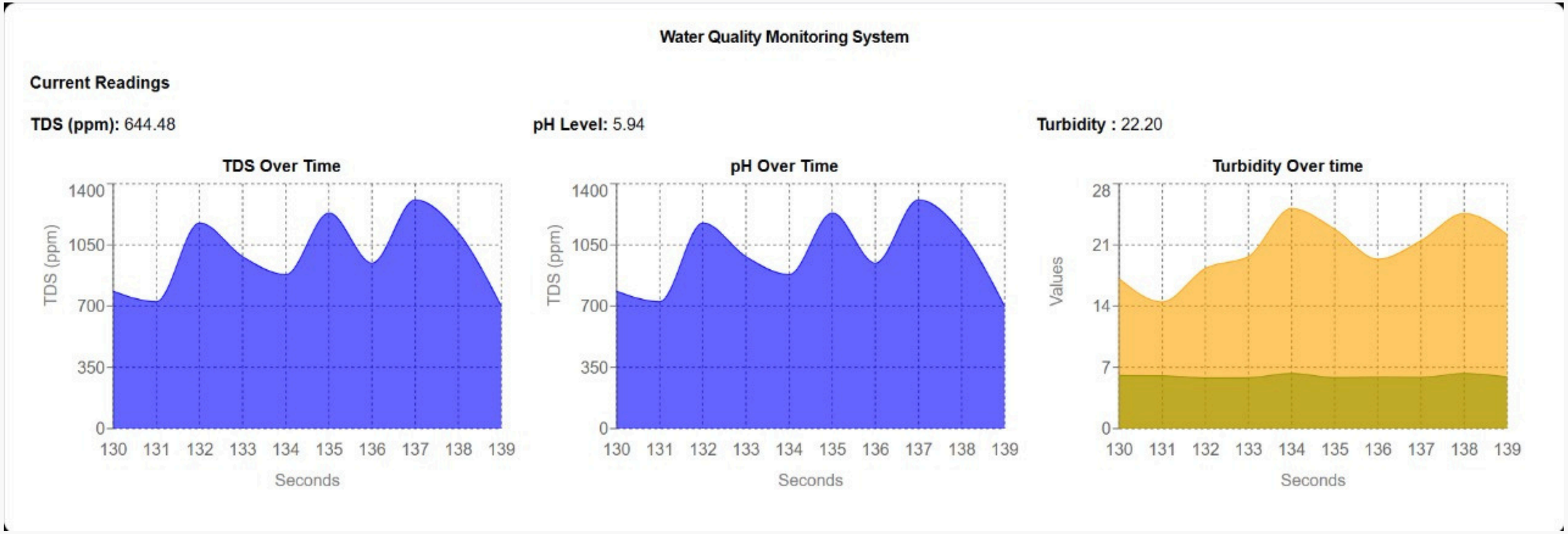
### Web Application

Create a user-friendly application which displays real-time updates and alerts about the quality of the water through an interactive dashboard

# CLASSIFICATION MODEL

- Support vector machine was used to pre-train the model using historical data.
- Trained on kaggle dataset with over 3000 records containing parameters like pH value, turbidity and conductivity values.
- Exported the model to raspberry pi using model weights - variances(x1 + x2 + x3) and bias (b)

# WEB APP


Water Quality Monitoring System
Current Readings
TDS (ppm): 644.48
pH Level: 5.94
Turbidity : 22.20
TDS Over Time
TDS (ppm)
1400
1050
700
350
0
130 131 132 133 134 135 136 137 138 139
Seconds
pH Over Time
TDS (ppm)
1400
1050
700
350
0
130 131 132 133 134 135 136 137 138 139
Seconds
Turbidity Over time
Values
28
21
14
7
0
130 131 132 133 134 135 136 137 138 139
Seconds

# *REFERENCES*


- Dataset - https://www.kaggle.com/datasets/adityakadiwal/water-potability/data
- Block Diagram - https://www.pantechsolutions.net/iot-based-water-management-system-using-raspberry-pi
- Reference Research Paper - https://r.search.yahoo.com/_ylt=Awrx.dku59lmLAQAt4y7HAx.;_ylu=Y29sbwNzZzMEcG9zAzEEdnRpZAMEc2VjA3Ny/RV=2/RE=1726766127/RO=10/RU=https%3a%2f%2fwww.ijsdr.org%2fpapers%2fIJSDR2305222.pdf/RK=2/RS=aOqzchIp8iBTPcemIcC.B2eG3Go-

*Thank you*