



AI/ML BASED IOT FRAMEWORK FOR WIDE AREA WATER QUALITY AND QUANTITY MANAGEMENT SYSTEMS

MENTOR

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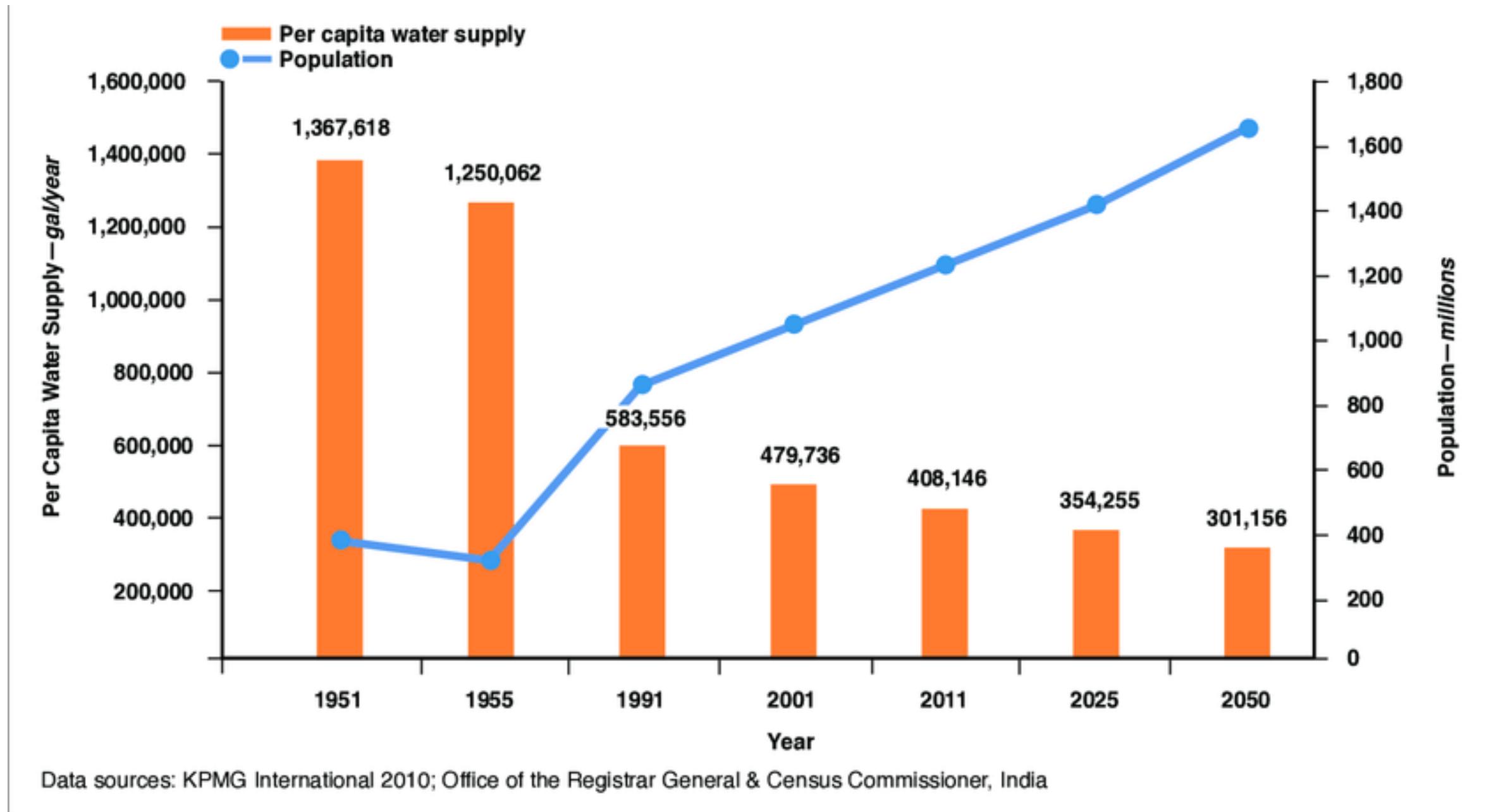
OUTLINE



- MOTIVATION
- PROBLEM STATEMENT
- LITERATURE SURVEY
- PROPOSED METHODOLOGY
- PROGRESS - HARDWARE POC,AI/ML MODEL
- FUTURE



MOTIVATION



As the global population continues to rise, the demand for freshwater increases, putting immense pressure on available resources. Simultaneously, water quality is often compromised by pollution and over-extraction, threatening ecosystems and human health. Managing water sustainably is crucial to ensuring access to clean water for future generations.

PROBLEM STATEMENT



END TO END FRAMEWORK FOR
MONITORING, USING DIFFERENT SENSORS
AND CREATING IOT AND CLOUD
PLATFORMS AND BUILDING A
RECOMMENDATION SYSTEM USING AI/ML
MODELS FOR NOTIFICATION AND
PLANNING OF WATER RESOURCES

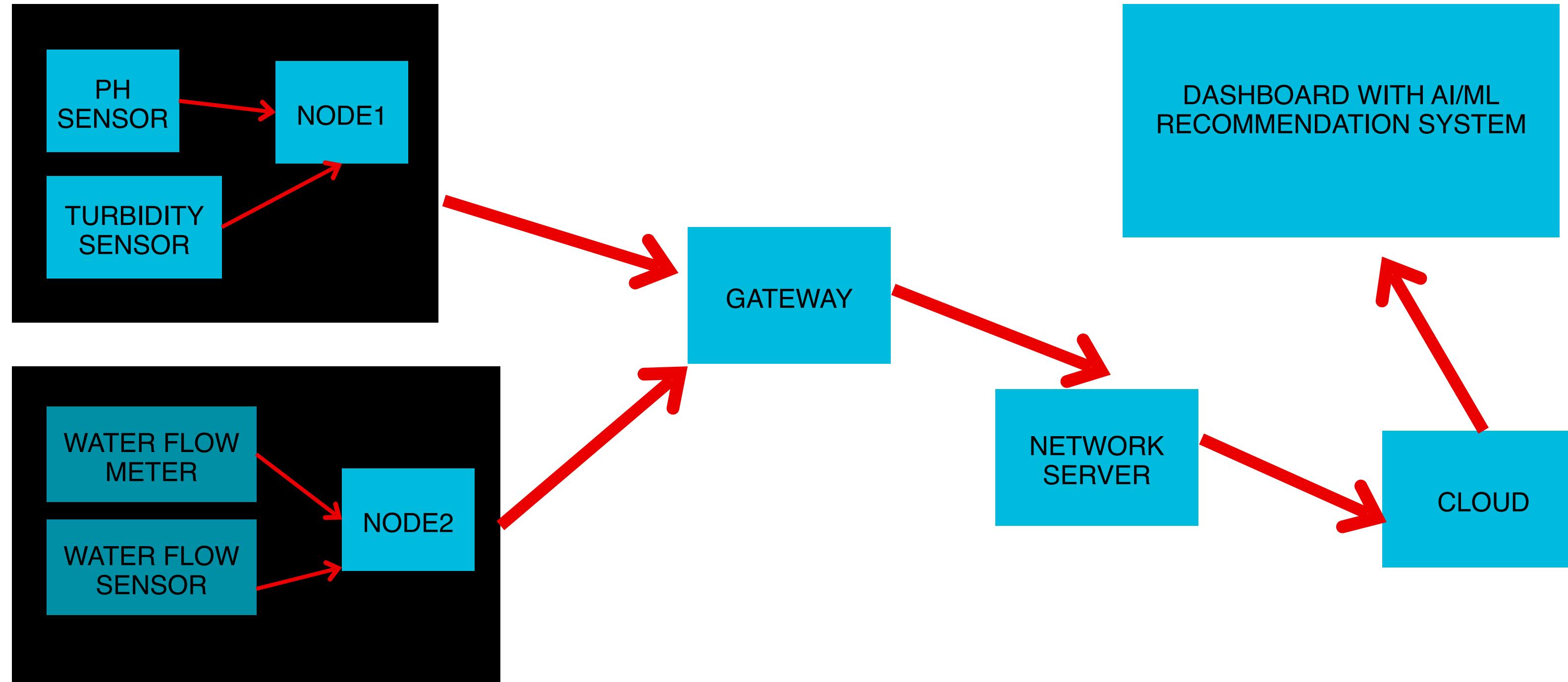


LITERATURE SURVEY



YEAR	TITLE OF THE PAPER	AUTHOR NAME	CONTRIBUTION	OBSERVATION
2022	WaterNet: A Network for Monitoring and Assessing Water Quality for Drinking and Irrigation Purposes	O. Ajayi, A. B. Bagula, H. C. Maluleke, Z. Gaffoor, N. Jovanovic and K. C. Pietersen	WaterNet leverages LoRa and machine learning for real-time water quality monitoring and classification.	It lacks automated corrective actions and struggles with real-time environmental changes.
2017	Internet of Water Things: A Remote Raw Water Monitoring and Control System	A. C. D. S. Júnior, R. Munoz, M. D. L. Á. Quezada	The IoWT system enables real-time remote water monitoring using IoT-based sensors and cloud processing.	Dependence on 3G networks may lead to data loss and unreliable communication.
2021	IoT-Enabled Water Monitoring in Smart Cities With Retrofit and Solar-Based Energy Harvesting	N. Bawankar, A. Kriti, S. S. Chouhan and S. Chaudhari	The system retrofits analog water meters with IoT capabilities, enabling real-time water monitoring using solar-powered edge computing.	The system's dependence on Wi-Fi for data transmission may limit deployment in remote areas with poor connectivity.

PROPOSED METHODOLOGY



PROGRES S



HARDWARE POC



WATER LEVEL
SENSOR



WATER FLOW
METER



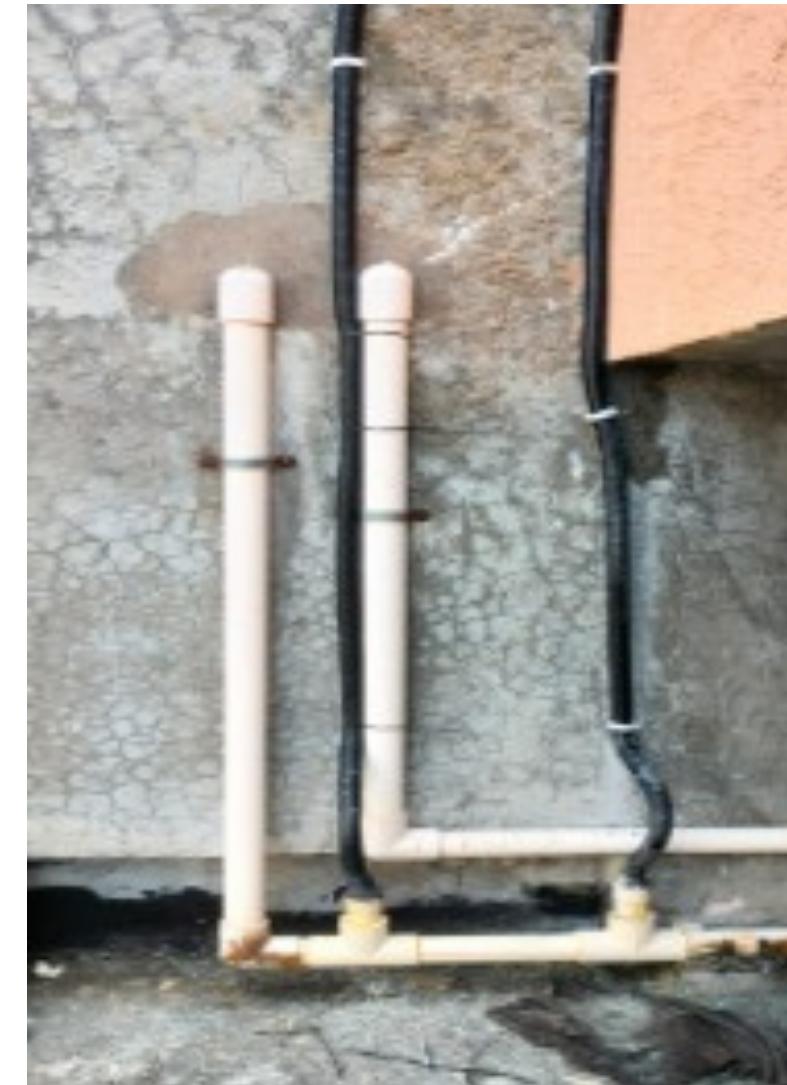
LORA
NODE



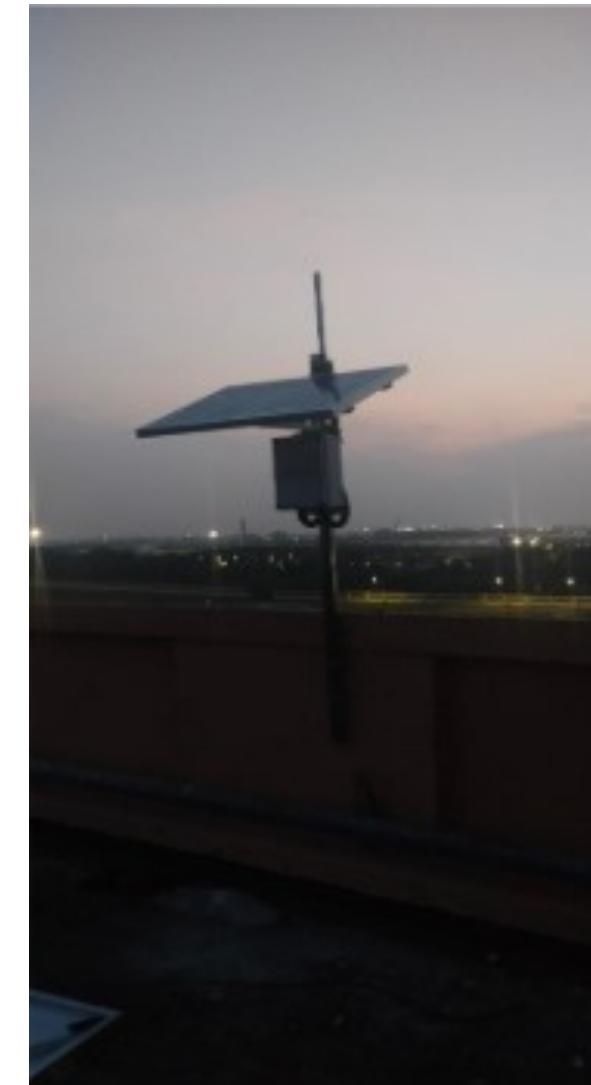
HARDWARE POC



TURBIDITY
SENSOR



PH AND DO
SENSOR



GATEW
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DATAS

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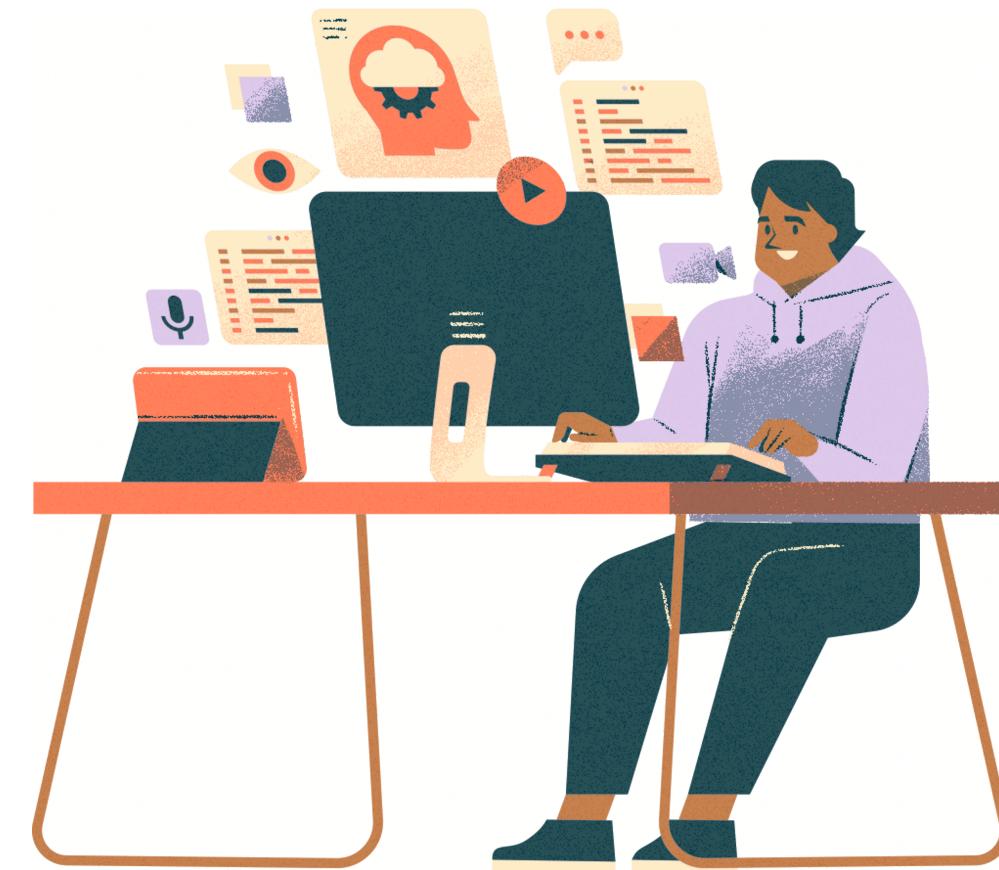
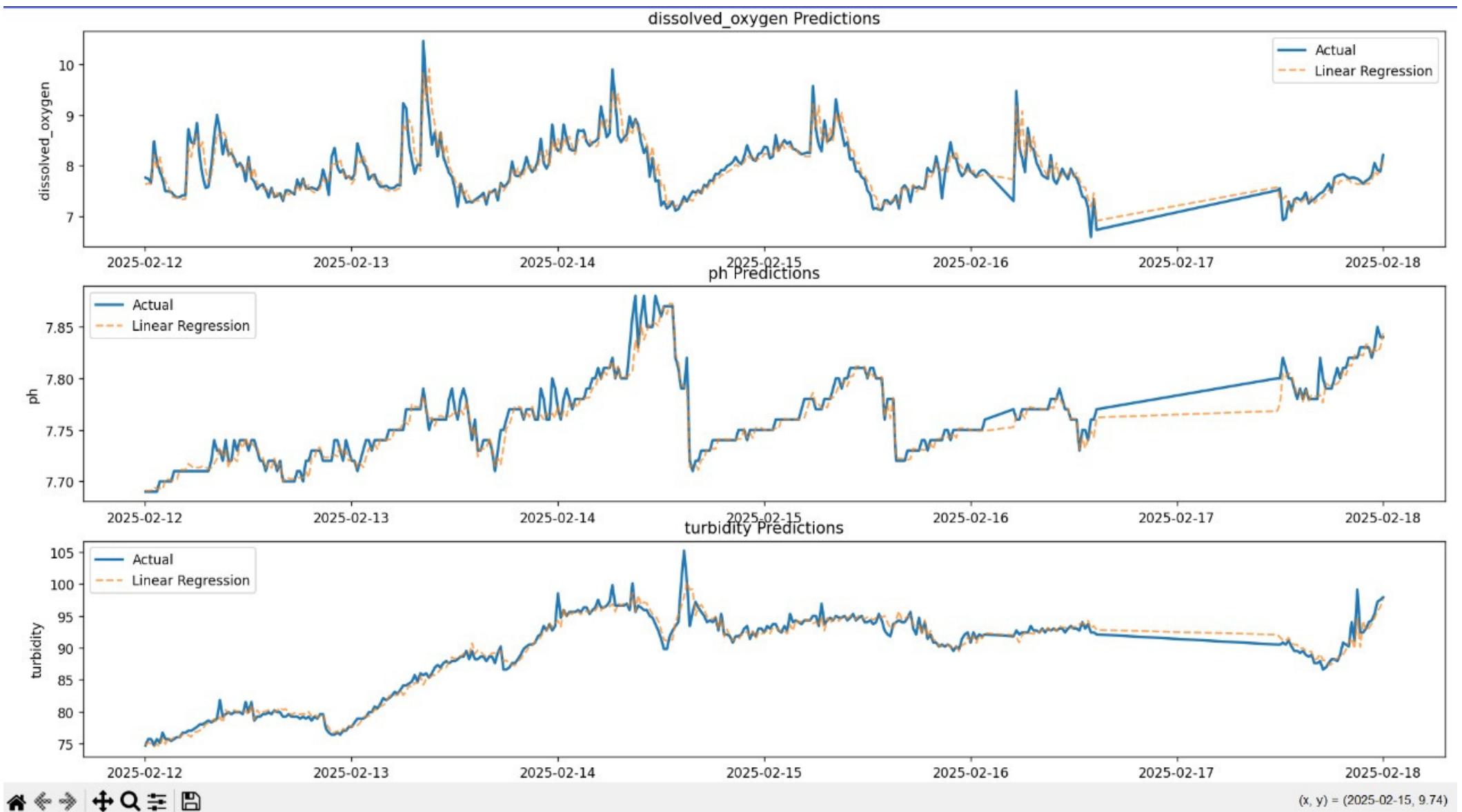
AI/ML MODEL



Serial No.	Date	Time	Device Name	batv	dissolved_oxygen	ph	turbidity
1	2/17/2025	23:59:25	IIIT water quality	3.936	8.21	7.84	97.9
2	2/17/2025	23:39:25	IIIT water quality	3.936	7.88	7.84	97.5
3	2/17/2025	23:19:26	IIIT water quality	3.936	7.91	7.85	97.2
4	2/17/2025	22:59:26	IIIT water quality	3.936	8.05	7.83	95.3
5	2/17/2025	22:39:26	IIIT water quality	3.936	7.81	7.82	94.3
6	2/17/2025	22:19:27	IIIT water quality	3.936	7.73	7.83	94
7	2/17/2025	21:59:27	IIIT water quality	3.942	7.7	7.83	93
8	2/17/2025	21:39:27	IIIT water quality	3.942	7.64	7.83	92.4
9	2/17/2025	21:19:28	IIIT water quality	3.942	7.7	7.83	92.4
10	2/17/2025	20:59:28	IIIT water quality	3.948	7.74	7.82	99.1
11	2/17/2025	20:39:28	IIIT water quality	3.948	7.76	7.82	91.1
12	2/17/2025	20:19:29	IIIT water quality	3.942	7.76	7.82	94
13	2/17/2025	19:59:29	IIIT water quality	3.942	7.75	7.82	90.2
14	2/17/2025	19:39:29	IIIT water quality	3.948	7.79	7.81	90.5
15	2/17/2025	19:19:30	IIIT water quality	3.948	7.83	7.81	90.8



AI/ML MODEL



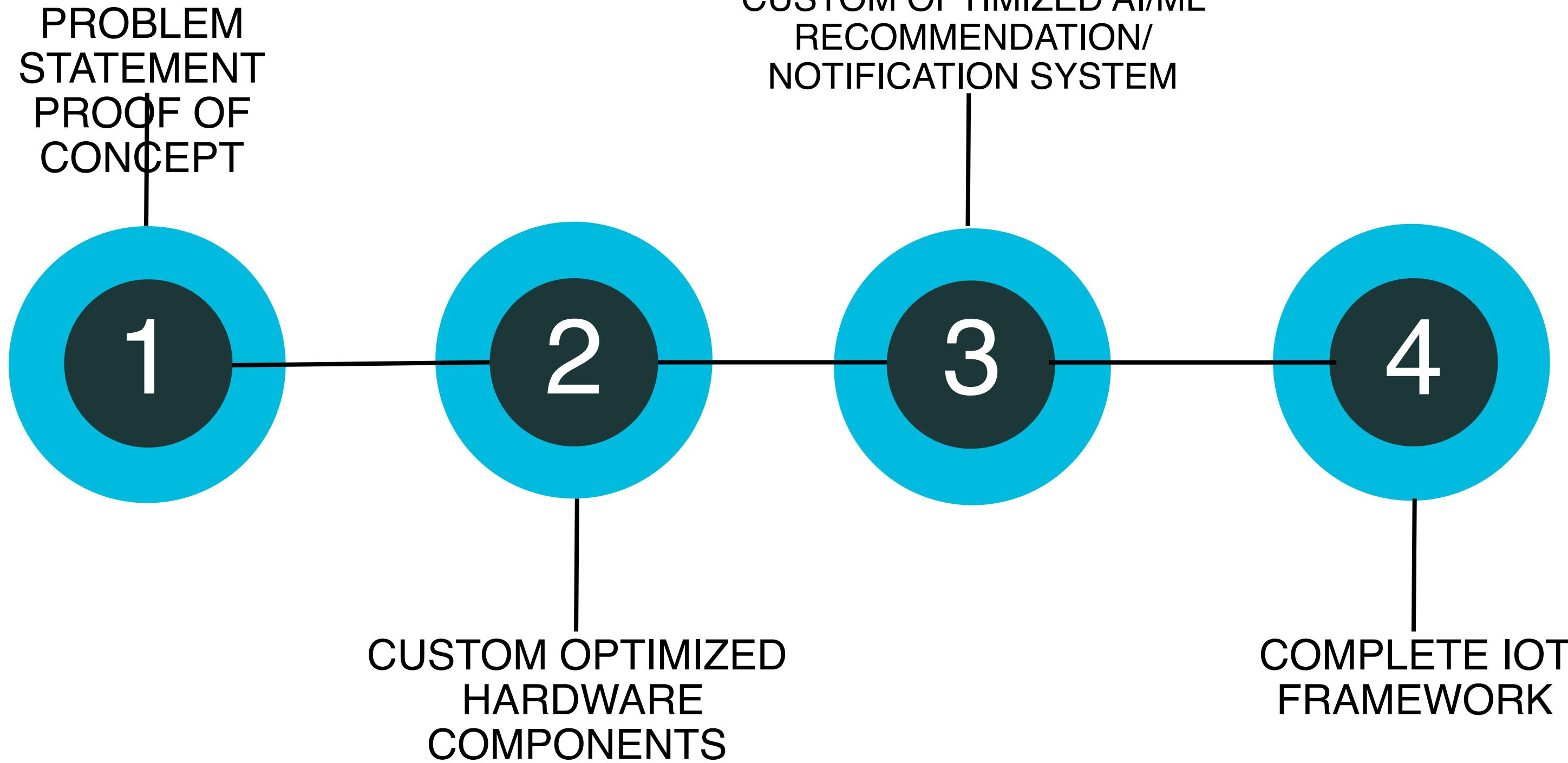
Linear Regression Performance:						
Target	MAE	RMSE	Bias	R ² Score	Accuracy (%)	
dissolved_oxygen	0.1412	0.2018	0.0141	0.8533	85.33	
ph	0.0062	0.0095	-0.0036	0.9417	94.17	
turbidity	0.6590	0.9911	-0.0470	0.9776	97.76	

REGRESSION MODEL
GRAPH



REGRESSION MODEL
PERFORMANCE

FUTURE evaluation





THANK YOU!

