IES COLLEGE OF ENGINEERING
(An ISO 9001: 2008 Certified Institution)
Chittilappilly P.O., Thrissur, Kerala - 680 551, Ph : 0487-2309966, 2309967
Fax: 2307077, E-mail: mail@iesce.info, www.iesce.info
Approved by AICTE. New Delhi & Affiliated to APJ Abdul Kalam Technological University

AI-Powered Water Quality Detection and Purification Recommendation System using Refractive Index

ABIN SANTHOSH [Reg. No. IES22CS006]
ADHITH SUNIL [Reg. No. IES22CS007]
ADHWAITH T T [Reg. No. IES22CS008]
ANITTA RAPHI E [Reg. No. IES22CS025]

Department of Computer Science and Engineering
IES COLLEGE OF ENGINEERING,CHITTILAPILLY,THRISSUR
Under the Guidance of Ms. MEETHU M B
Assistant Professor,Department of CSE

TARGETS OF THE MAIN PROJECT WORK

ACTIVITIES	STATUS	ACTIVITIES	STATUS
Domain & problem identified	Yes	Development of prod-uct	No
Literature Review	Yes	Testing	No
Objectives formulated	Yes	Obtained Result	No
Methodology / Design	No	Documentation	No
Created work plan and task allocation	No	Report submission	No

INTRODUCTION

- Water pollution from industrial and domestic waste poses serious **health risks** and **degrades water** quality.
- Regardless of **time—past, present, or future**—we must know our water before consuming it to protect health and ensure well-being.
- To consume water safely, ones must first **identify the impurities** and then choose the **right purification method**.
- The base paper reviews traditional physico-chemical analysis techniques like **pH, turbidity, TDS, and hardness**.
- Introduce **refractive index** as a novel parameter and **integrate AI** to enhance detection accuracy and suggest purification strategies.

PROBLEM STATEMENT

- Water quality monitoring is vital for safe usage, but current practices often separate pollutant detection, data analysis, and purification. This **fragmented approach** leads to delays in identifying harmful substances like TDS, turbidity, and pH, making water treatment **less effective** and increasing health risks.

LITERATURE REVIEW

SL	NAME OF THE PAPER	OUTCOME	AUTHOR AND PUBLICATION DETAILS
1	AI-Driven Transformation of Water Treatment Technology	Explored AI's role in optimizing water treatment processes and industry innovation.	Lili Jin, Hui Huang, Hongqiang Ren, Frontiers of ESE, 2025
2	Emerging Trends in Real-Time Water Quality Monitoring	Highlighted IoT and sensor-based systems for global water sanitation challenges.	Preeti Verma, Pankaj Mehta, IntechOpen, 2025

LITERATURE REVIEW (Contd.)

SL	NAME OF THE PAPER	OUTCOME	AUTHOR AND PUBLICATION DETAILS
3	Effect of Temperature and Wavelength on Refractive Index of Water	Measured refractive index variations using fiber-optic sensors for water purity analysis.	Esra Kendir, Şerafettin, Indian Journal of Physics, 2022
4	Science and Technology for Water Purification: Achievements	Surveyed advanced purification technologies including membrane filtration and adsorption	Yuanfeng Qi and Kai He, MDPI Water, 2025

LITERATURE REVIEW (Contd.)

SL	NAME OF THE PAPER	OUTCOME	AUTHOR AND PUBLICATION DETAILS
5	Recent developments in water purification	Shows that advanced water-purification technologies: hybrid oxidation systems, advanced membranes, AI-driven purification	Ramakant, Shuchi, Manvi, IJ Advanced Chemistry Research,2025
6	AI for clean water: efficient water quality prediction	Real-time prediction of multiple water quality parameters enabling optimization	Ansari et al, Water Practice & Technology, 2024

LITERATURE REVIEW (Contd.)

SL	NAME OF THE PAPER	OUTCOME	AUTHOR AND PUBLICATION DETAILS
7	Water Expert (rule-based DSS)	Hybrid rule-based expert system for water decontamination decisions	Gutenson ,Drink. Water Eng. Sci. Discuss ,2015
8	DOxy: A Dissolved Oxygen Monitoring System	Low-cost IoT system calibrated for DO sensing using pulse-oximetry in water environments	Shaghaghi, MDPI ,2024

LITERATURE REVIEW (Contd.)

SL	NAME OF THE PAPER	OUTCOME	AUTHOR AND PUBLICATION DETAILS
9	Water Quality Monitoring System Based on IoT	Arduino-based system with pH, temp, water level + automation	Dr. B. Shravan Kumar, G. Rohith, A. Sai Balaji, E. Tanishq, IJETRM, March 2025
10	Low-Cost IoT System for Turbidity Measurement	Real-time turbidity monitoring using low-cost sensors	Nur Amalina Binti Rosle, Bin Alias, IEEE, 2024

OBJECTIVES

- review key **physico-chemical** parameters such as pH, turbidity, TDS, and hardness that influence water quality and health risks.
- introduce **refractive index** as an additional parameter for enhancing the accuracy of water impurity detection.
- support informed water usage decisions by providing users with clear, actionable **purification recommendations** based on detected contaminants.

SCOPE OF PROJECT

- Foundation for future integration with **IoT-based** water monitoring networks, enabling continuous and remote data collection.
- Extended to mobile platforms, making water testing accessible through smartphones and **portable devices**.
- Opens avenues for further **research** in AI-driven environmental monitoring and smart purification systems.
- Serve as a prototype for **smart city infrastructure**, contributing to automated water safety networks.

Thank You