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

ABSTRACT

This project presents an intelligent system for detecting water quality by measuring the refractive index (RI) of a sample and comparing it with that of pure water. Deviations in RI indicate the presence of impurities or dissolved substances. By analyzing these deviations, the system estimates the type and concentration of contaminants. To enhance decision-making, an AI-based model is integrated, which learns from various impurity patterns and provides tailored purification suggestions such as activated carbon filtering, reverse osmosis, or UV treatment. This hybrid approach—combining optical sensing with artificial intelligence—offers a portable, low-cost, and real-time solution for water quality assessment and smart purification guidance, particularly beneficial for rural areas and domestic applications.

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