



Visual Assessment of Water's Purity by Utilizing Machine Learning and Computer Vision

CONTEXT

System aims to leverage the capabilities of machine learning algorithms and computer vision techniques to provide a cost-effective, efficient, and non-invasive method for monitoring water quality, which is crucial for environmental protection, public health, and industrial processes.

CHALLENGE

Develop an automated system that can accurately determine the purity levels of water samples by analyzing visual data using advanced image analysis and machine learning algorithms.

Project have some constraints as mentioned below:

- Project includes ensuring high accuracy and reliability of the purity assessments, developing an algorithm that can process visual data efficiently, the development of robust ML models that can handle variations in water samples.
- The system must be designed to work in different environmental conditions and be scalable to handle large volumes of data. Also, system is robust enough to handle a wide range of scenarios. Additionally, it should be adaptable to incorporate future advancements in technology and changes in water purity standards.



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STEPS TO DEVELOP YOUR PROJECT

1. Data collection and analysis

- Collection of large water sample images under various environmental conditions. It will also require the creation of a robust dataset that includes labeled images indicating various levels of water purity.

2. ML/DL model building

- These images will be used to train a machine learning model. The model will learn to correlate specific visual patterns and features with levels of water purity. Computer vision techniques will be employed to enhance the model's ability to discern subtle differences in the water samples.
- The machine learning component will involve the selection of appropriate algorithms, feature extraction techniques, and the optimization of model parameters.



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STEPS TO DEVELOP YOUR PROJECT

3. Optimized real time inferences

- The project will focus on optimizing the computer vision algorithms to work effectively in real-time scenarios, which is crucial for practical applications.

GOAL

- Overall, this project has the potential to revolutionize the way we assess water quality, making it more accessible, efficient, and cost-effective.
- Project's outcome has the potential to revolutionize the way water quality is monitored, offering accurate and consistent water purity assessments, its adaptability to different types of water sources, and its contribution to the field of environmental monitoring.
- It aligns with global efforts to ensure clean water access and contributes to the broader field of environmental monitoring through technological innovation. By leveraging the power of machine learning and computer vision, this project stands to make significant contributions to the field of water quality analysis.



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JUDGING CRITERIA

- Accuracy and reliability of the water purity assessments, the speed of analysis, and the system's usability.
- Should also be scalable, capable of being deployed in different settings, from small-scale household assessments to larger-scale water treatment facilities.

SUBMISSION GUIDELINES

- Introduction (Team /Individual - Names, college, graduation)
- What is the problem?
- Methodology & Approach to the solution in which show Block/flow diagram explaining steps followed to solve problem.
- Which hardware or software were used in this solution.
- Reference links, book details explaining data/solution.
- Up to 5 members per team
- Deadline: Sunday | August 11 – 11:59 PM IST