SMART INDIA HACKATHON 2024

"AI-Driven Real-Time River Pollution Monitoring and Forecasting System"

- **Problem Statement ID –SIH1694**
- **Problem Statement Title- Real-time ganga river water quality forecasting**
- **Theme- Smart Automation Dataset**
- **PS Category- Software**
- **Team ID: T-22**
- **Team Name - Mavericks**

Mavericks

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Smart River Management: Leveraging AI for Predictive Pollution Control

Our cloud-based platform integrates AI and IoT to monitor and predict river pollution. It collects data from sensors and satellite imagery, uses machine learning for predictions, and provides real-time alerts on a user-friendly dashboard.

Key Benefits:

- **Real-Time Monitoring**: Early detection of pollution.
- **Predictive Analytics**: Forecasts future pollution levels.
- **Decision Support**: Offers actionable insights.

Unique Features:

- **Advanced AI**: Improved prediction accuracy.
- **Comprehensive Data**: Integrates multiple data sources.
- **Scalability**: Adapts to various regions.
- **User-Friendly**: Intuitive interface for stakeholders.

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TECHNICAL APPROACH

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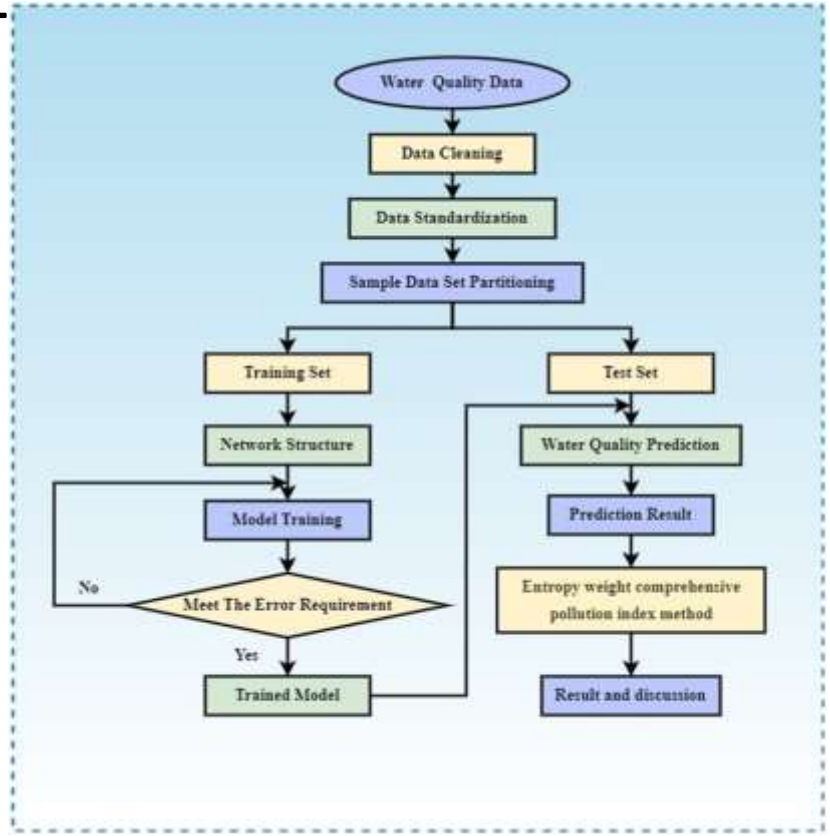
Technologies: Python, Django REST, TensorFlow, IoT Sensors and React

Methodology:

- **Data Collection**: IoT sensors for real-time river data.
- **Model Development**: Development models for pollution forecasting.
- **Deployment**: Cloud-based platform for real-time data processing and user interaction.



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FEASIBILITY AND VIABILITY

Technical Feasibility: Use of scalable cloud services and robust AI/ML models.

Challenges & Mitigations:

- **Data Quality**: Regular sensor calibration.
- **Latency**: Edge computing to reduce processing time.
- **Scalability**: Modular design for different river systems.

IMPACT AND BENEFITS

Impact: Enhanced monitoring for environmental agencies, proactive management for industries, safer communities.

Benefits:

- **Social**: Protects public health.
- **Economic**: Reduces environmental cleanup costs.
- **Environmental**: Supports sustainable water resource management.

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RESEARCH AND REFERENCES

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- AI in Monitoring: https://www.sciencedirect.com/science/article/pii/S0301479722001092
- Hydrological Models: https://iwaponline.com/hr/article/52/2/237/77887
- Real-time Data Processing: https://www.sciencedirect.com/science/article/pii/S0022169420307358
- Precipitation & Temperature: https://mausam.imd.gov.in/