

# Applying Machine Learning Techniques to Evaluate Water Quality in Reservoirs

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## Introduction

- Water in reservoirs is a vital resource for all living organisms. Various properties of water in **reservoirs**, especially its **quality**, must be assessed. Assessing the quality of water critically enables managers to **develop optimal water resources management plans**.
- **Carlson's Trophic State Index (CTSI)**, a fundamental index that was developed in 1977, is commonly used by water management agencies and organizations around the world.
- The **Taiwan Environmental Protection Administration (TEPA)** has adopted **CTSI** as the official index of water quality, accounting for its state of eutrophication, in reservoirs.
- While classical methods evaluate the Carlson's Trophic State Index from conventional variables, recent researches have sought active solutions for water management.
- AI based approaches have advantages over the traditional deterministic methods as they reduce the complexity that is associated with a large number of factors and the necessary sophistication of quantifying traditional water parameters.

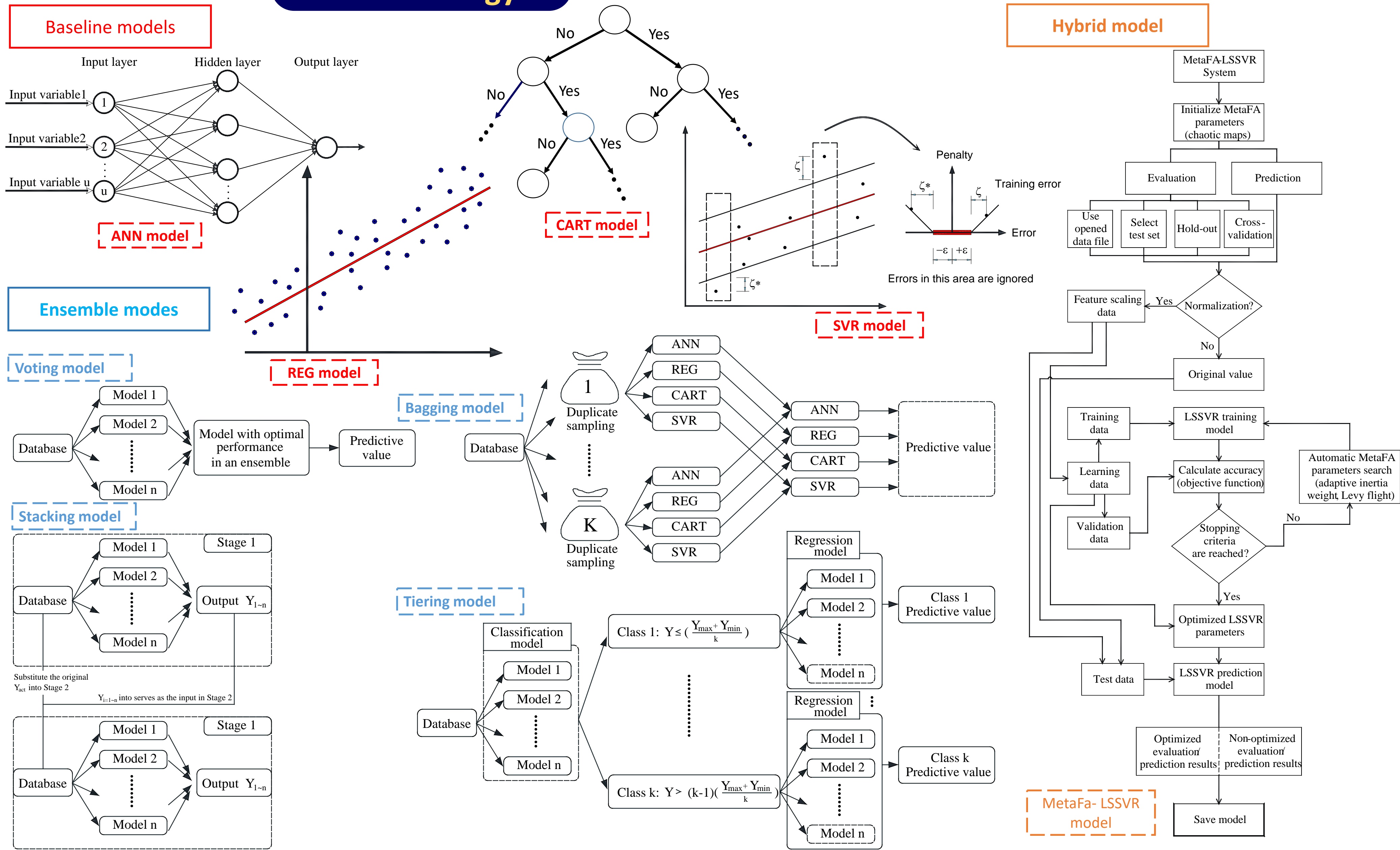
### Objectives:

- Develop a versatile water quality modeling approach, including single, ensemble, and hybrid models.
- Enable managers or water scientists who use AI for water management to choose the best analytical tools for various purposes.

## Data



## Methodology



## Conclusions and Recommendations

### Data mining applications

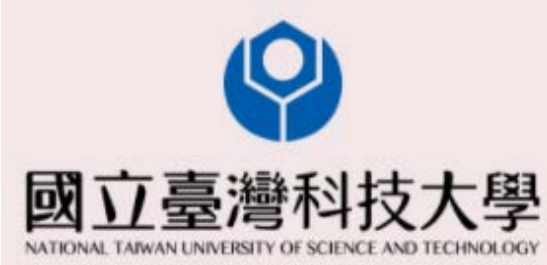
- Provide a versatile modeling system for the dataset of water quality in reservoir using multiple AI technique in several analytic tools.
- Offer a comprehensive comparison among several baseline models and sophisticated models.
- Examine the efficacy of AI application in diverse software.

### Water quality management

- Propose an alternative to the conventional approach for assessing and predicting CTSI.
- Reduce the cost and complexity of the experimental measurement in determining three traditional parameters in the CTSI formula.
- Offer diverse predictive methods to meet the specific requirements water quality managers.
- Support the experts to give the optimal solutions in water quality researches, contribute to the sustainable development of environment.

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## Results

