

Review on Water Quality Assessment using Statistical and Deep Learning Modeling

The main focus of the study will be to get the best fit model that can predict and forecast water quality in long run. The combine statistical and deep learning approach is new to the field of water quality assessment. This study will be one of the helping review on the statistical and deep learning approach that will benefit scientists, reviewers and environmentalist and will be helpful in water management of static and dynamic water bodies.

Methods:

Rivers in concern:

- i) *Buriganga*
- ii) *Hatirjheel*
- iii) *Dhaleshwari*
- iv) *Turag*

Data collection will be preliminary divided into four (4)/ three (3) sampling points putting into consideration the point of discharge close distance from industries. The distance from one sample point to another will be 20/30/40 m apart. The sampling will be focused on upstream to downstream of the river. The sampling will be done 2 days in a week. The water quality parameters will be considered in this study are:

- i) *Dissolved Oxygen (DO)*
- ii) *Temperature*
- iii) *pH*
- iv) *Electrical Conductivity (EC)*
- v) *Total Dissolved Solids (TDS)*
- vi) *Biological Oxygen Demand (BOD)*

Deep learning and Statistical Methods will be applied:

Statistical Approach:

- i) *Moving Average*

Deep Learning Approach:

- i) *Perceptron*
- ii) *CNN (Convolutional Neural Network)*
- iii) *RNN (Recurrent Neural Network)*
- iv) *LSTM (Long Short Term Memory)*
- v) *GRU (Gated Recurrent Unit)*
- vi) *XGBoost*
- vii) *Autoencoder Approach*
- viii) *Combine approach of moving average and autoencoder*
- ix) *Hybrid modeling of CNN, RNN, LSTM, GRU*

Instrument needed:

- i) *DO meter*
- ii) *pH meter*
- iii) *EC meter*

iv) Thermometer

Costing:

- i) Reading Meter purchase cost
- ii) Transport cost