

# Water Quality and Flood Detection Software

Group 20 - Dhaval Patel, Kruneet Patel, Charvi Virani, Michael Gallagher

The software system aims to detect and maintain water quality for supply management from natural water sources as well as overhead detection of floods. Its function is '*water purification and detection*' and '*monitoring the flood and forecasting*'. For this it will take data readings of certain key factors like dissolved oxygen level, temperature, pH, radiochemical and stable isotope analysis, conductivity, etc. from the water flow continuously across the state. These readings will be collected from multiple sensors and collected in a single <<Interface>> sensor. The system also tries to analyse the past weather data along with some critical factors like the temperature change in the surrounding terrain of the water body to predict the future water level and send out accurate flood warnings in advance.

The feature implemented in this scenario is data validation, which occurs before the data is sent to the main database. We also implement the 2 different GUIs for both the laboratory user and the public user based on the authorized level of their access. A UML activity diagram showing the flow of activity from both the sensor side and the user side is attached.

## **Scenario - Data Validation on Sensor end and GUI based on end-user's level**

In this scenario, we will simulate sensor input by using a GUI that will take tester input. This data is then validated against the accepted data type and format. This is to make sure that (a) the sensors are functioning properly and (b) corrupted data is not passed back to the database.

When the sensor system is first launched, there will be a GUI (<<Interface>> sensor) that will prompt for input from the tester. The tester (acting as multiple sensors that feed data to the <<Interface>>) will enter the required parameters in the text box.

When the tester submits the values, these parameters will then be validated for (a) the data type of the parameter to be passed and (b) the acceptable value range for the input parameter. Validation will be done in the above mentioned order of priority.

Upon successful passing of the validation, the system will display a prompt showing 'Validation Passed'. Upon failure, the system will display a prompt showing 'Incorrect Data Entered' along with the type of validation failed. If failure is repeated multiple times, this means the data is corrupted and a message is sent to notify the malfunctioning of the sensor.

We will also design two different GUI's based on the level of access a user is supposed to have to interact with the database. Thus, we will have two different access levels (a) Lab User and (b) Public User.

When the user system is first launched, it will ask for the type of user that you are. Then, it will display GUI and data based on the type of user selected.

### Activity Diagram - interaction between sensors, database and users based on roles

