Design document

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High level description

The software monitors real-time data on greenhouse gases and compares current data with historical data on greenhouse gases. Real-time data comes from SMEAR API and historical data comes from STATFI API.

We are planning to use C++ language, QtCreator and Qt's libraries for the project, because everybody in our group has experience of it. We will keep the libraries open, so if we realize that we need some specific library we might add that to the code.

The chart 1 will explain the high-level description and show how the classes are linked together. We selected this structure, because it's easy to keep the UI and the data handling separate from each other. Error handling is also clearly its own class.

Boundaries and interfaces

UI Front Page starts the user interface application. Function startUI() will start the user interface. It connects to the Data-component, where all the data is stored and fetched. Data is fetched through getData(), a function that gets the data. In the Data-component there are e. g. time period, station, gas type and co2-type -datas. User can also save data with savePreferences(). UI Visualize shows data visually. In Error Handling component we can handle the errors when they appear. We handle the errors in errors()-function that can detect and take care of different types of errors. SMEAR API gets the data from SMEAR's API and STATFI API from STATFI's API. Both of these have getData()-functions which uses get-request to get the data from the interfaces. STATFI or SMEAR supplies the data, and the application demands the interface through user's action.

Design solutions

We decided to put the SMEAR and the STATFI decision at the top of the front page, because it affects on what to ask next from the user.

If the user selects SMEAR, he/she will be asked about the time period, monitoring station, greenhouse gas and different ways to present the data. Different monitoring stations will be represented in different graphs, and different greenhouse gases will be represented in different lines inside those graphs.

If the user selects STATFI, he/she will be asked about the time period and dataset. Then the data will be shown in a graph. Different datasets will be represented in different lines.

If the user wants to compare the SMEAR and the STATFI data, he/she can select everything related to the data. Then the SMEAR data and STATFI data will be shown in separate graphs (meaning 2-4 different graphs, depending on how many monitoring stations have been selected).

In case user selects something that leads to some data being unavailable, it is shown as "grey" to indicate that the user cannot select it.

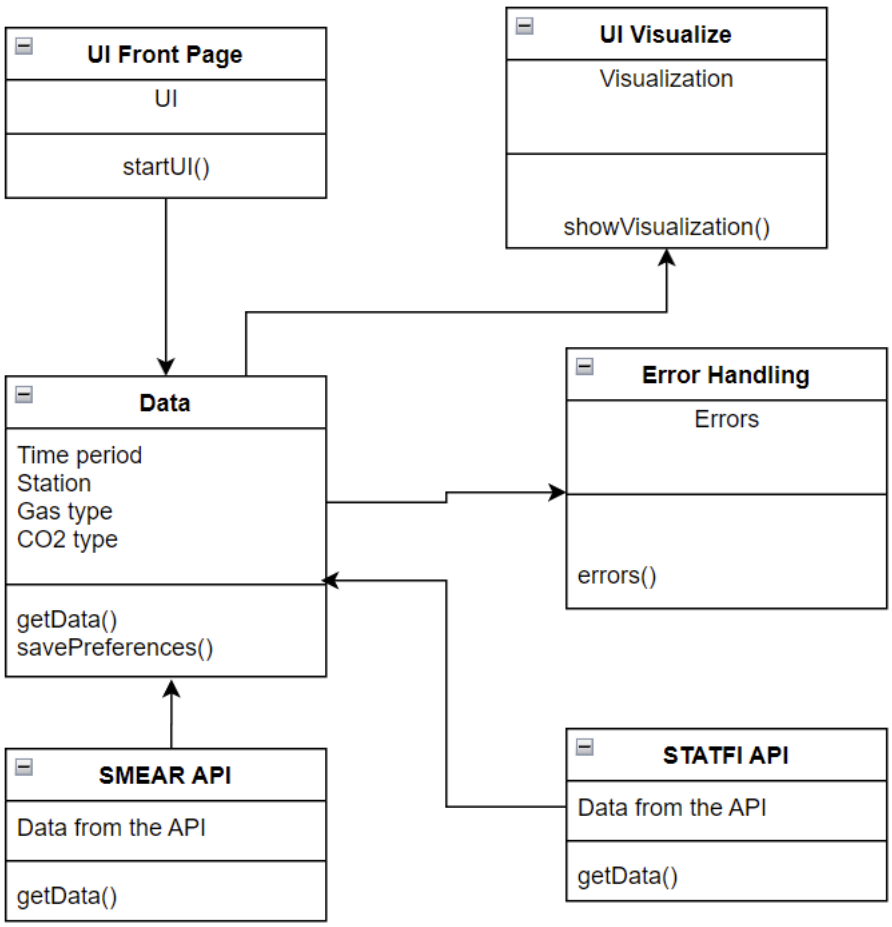
UI Front Page
UI
startUI()
UI Visualize
Visualization
showVisualization()
Data
Time period
Station
Gas type
CO2 type
getData()
savePreferences()
Error Handling
Errors
errors()
SMEAR API
Data from the API
getData()
STATFI API
Data from the API
getData()

Chart 1