GeoFilter Framework

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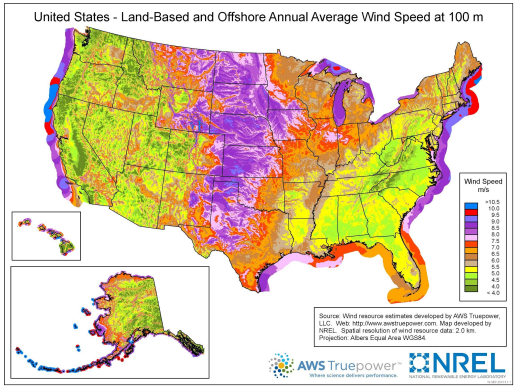
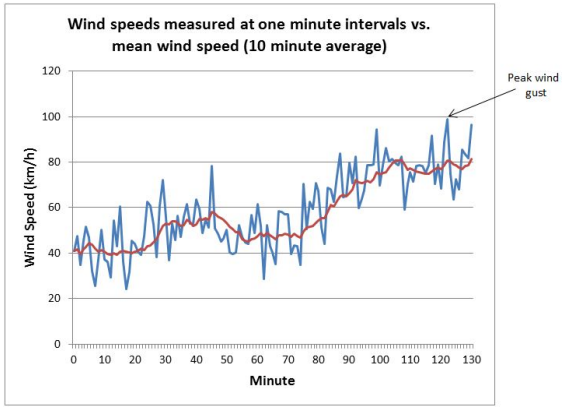
Domain Engineering

- Manipulate and analyze spatial-temporal data for visualization
- Different ways of filtering the data to see a subset of the full data
- Example Data:
  - Data Plugin reading in csv files of US Air Quality Index
    Display Plugin showing a heat map of the US Air Quality
  - Any kind of data with X and Y coordinates, and Time will suffice
    Visual Plugins can be almost anything



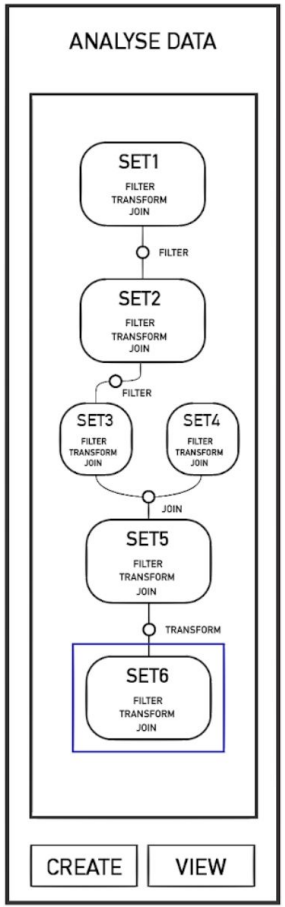


Domain Engineering - Continued

- Reusable Parts : Different methods of filtering, processing, and transforming data, allowing client to interact with the data and visualize it on the spot

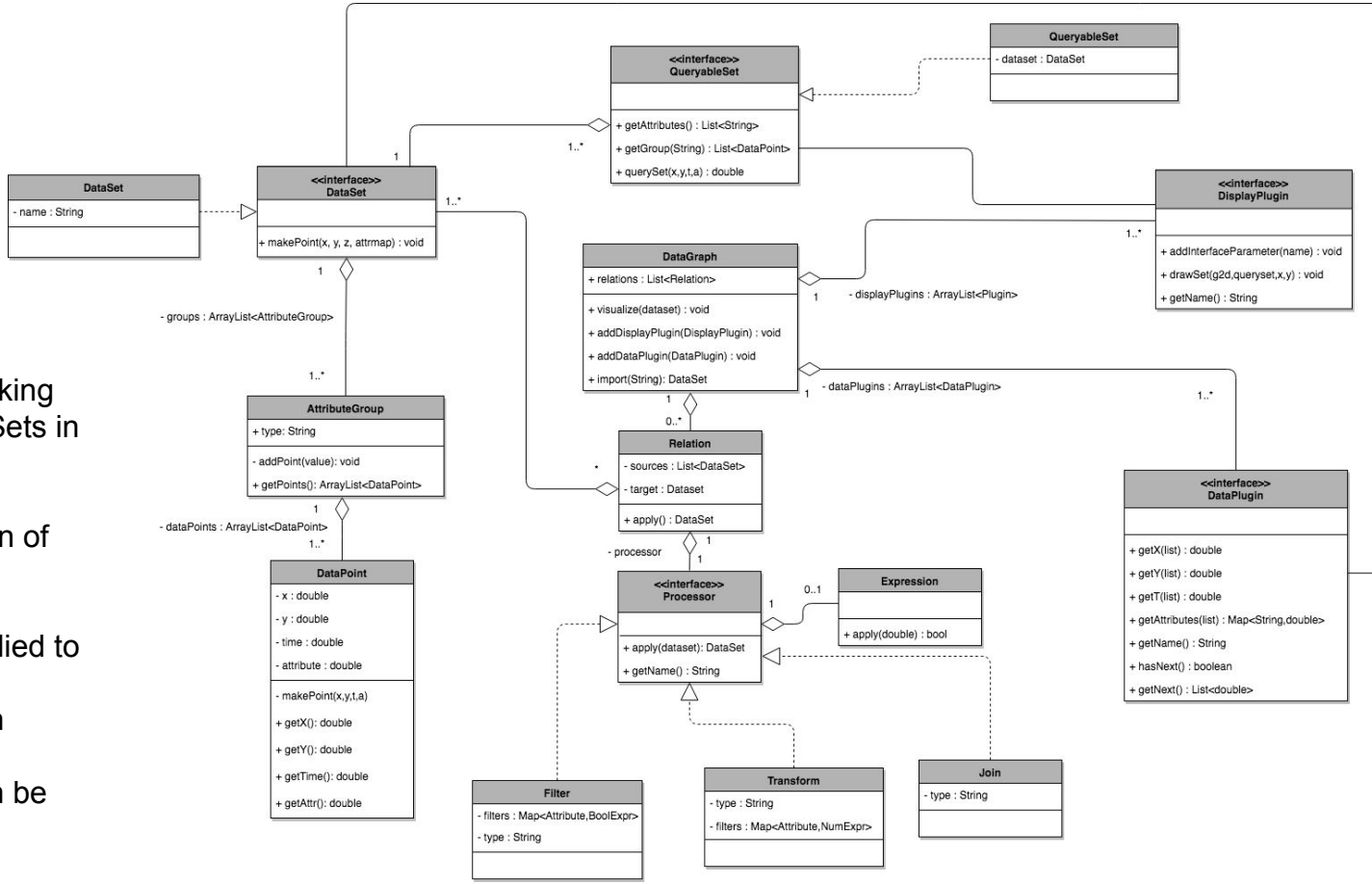
- Key Abstractions : The storage of the data, the data-processing workings

- Potential Flexibility: In addition to being flexible with plugins, there could be added functionalities to the processors to include other processing techniques, such as Fourier Transform



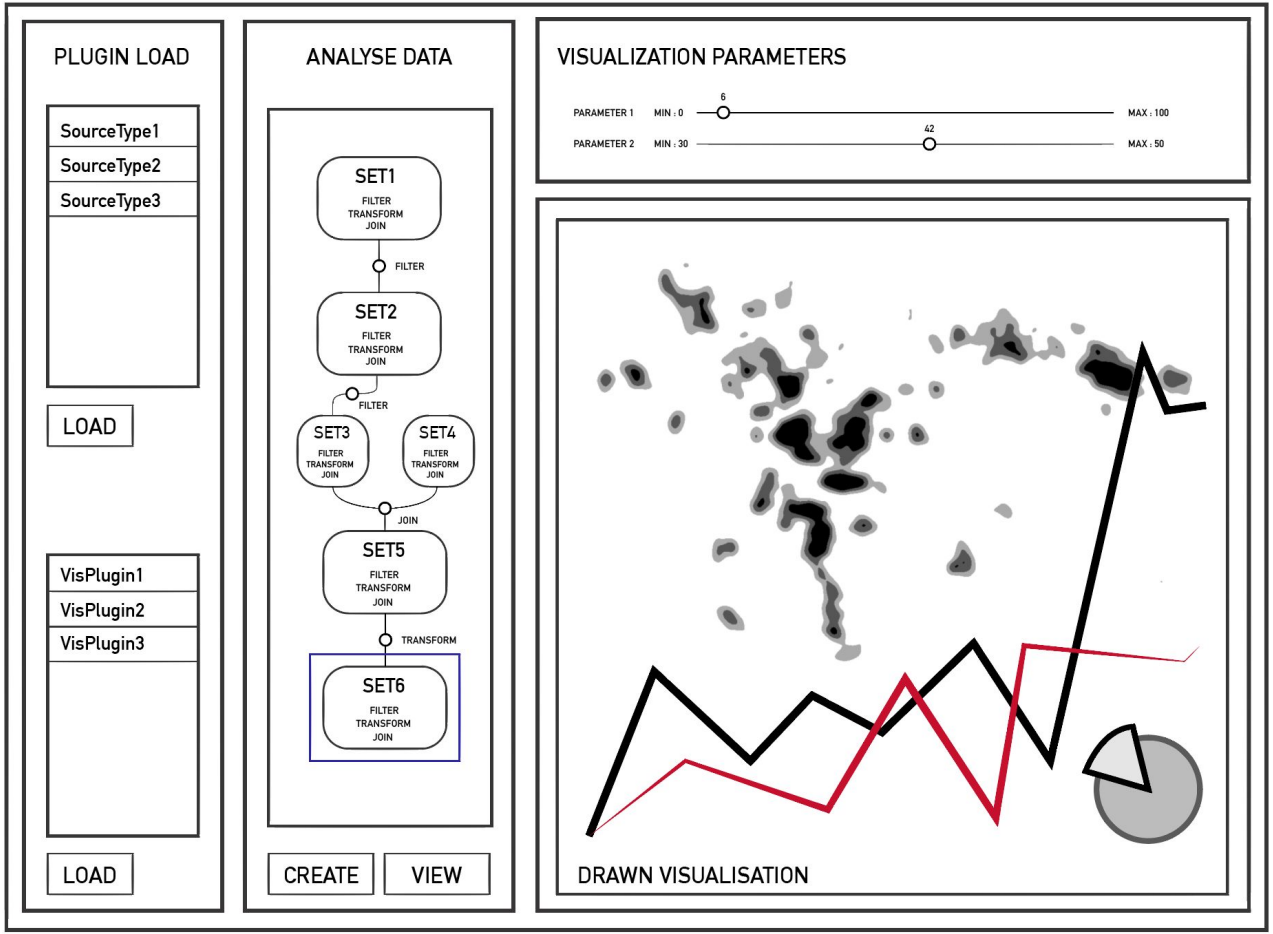
Object Model

- DataGraph provides linking between existing DataSets in framework
- Plugins create collection of data tagged with (x,y,t)
- Processors can be applied to data using arbitrary expression/composition
- Immutable DataSet can be queried to visualise



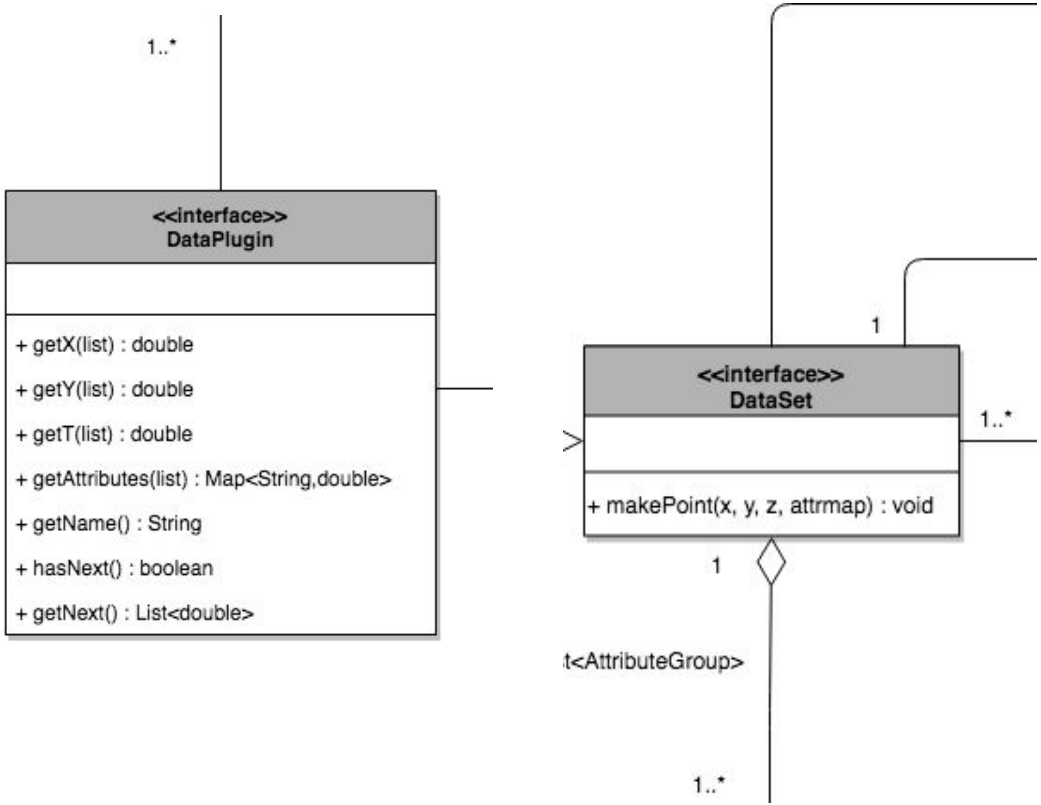
GUI

- Provides interface to register plugins dynamically
- Provides interface to graphically define data processing actions (Filter/Transform/Join)
- Provides canvas for plugins to add necessary parameters so that user can tune visuals

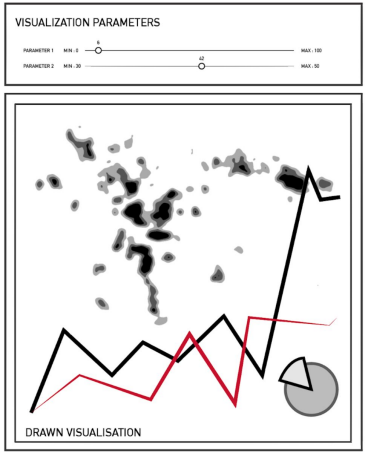


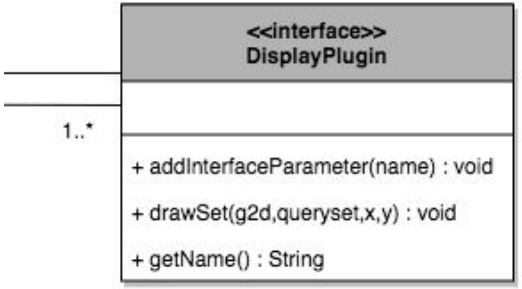
Interaction : Data Plugin

- HasNext and getNext will be used by the framework
- Provide getX, getY, getT, getAttributes method the framework can use



Interaction : Visual Plugin





- Visualisation plugin adds “sliders” to the interface, which the user can use to parameterise the current visualisation (e.g. thickness, colors, etc.)

- Visualisation can either use existing data in the set (via: getGroup(attribute)) or query a location in the set to interpolate an attribute from nearby (in location/time) data points.