

UNIMORE

UNIVERSITÀ DEGLI STUDI DI
MODENA E REGGIO EMILIA



VISUAL QUERYING AND RESULTS VISUALIZATION OVER VERY LARGE DATA STREAMS

Relatore:

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Candidato:

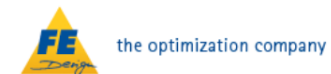
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Correlatore:

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Smart Vortex

- EU research project
- 14 partners



Smart Vortex

*Managing the complexity of highly specialized products in industrial environments requires today the ability of handling the different **Data Streams** produced in all phases of the product lifecycle. **Data Stream Management Systems** and **Stream Query Languages** represent a viable solution for processing and accessing large data streams to support analytical tasks as a basis for improving human collaboration and decision-making. However, the complexity of existing textual stream query languages often prevents unskilled users from effectively exploiting the available tools. A **Visual Query System** that allows users to graphically build queries over data streams and traditional relational data is needed. It must also provides configurable tools for the **graphical visualization of query results.***

Smart Vortex

Streams of data produced on each phase of the product lifecycle.

Data Streams:

- from sensors and analysis equipment
- of simulation and testing data
- of design data
- of multi-media collaboration data
- of higher level inferred events

The adopted Data Stream Management System:

- **SCSQ** (Super Computer Stream Query processor)
- Developed by Uppsala University

My contribution to the project

Design and implementation of a web-based, single user prototype, including:

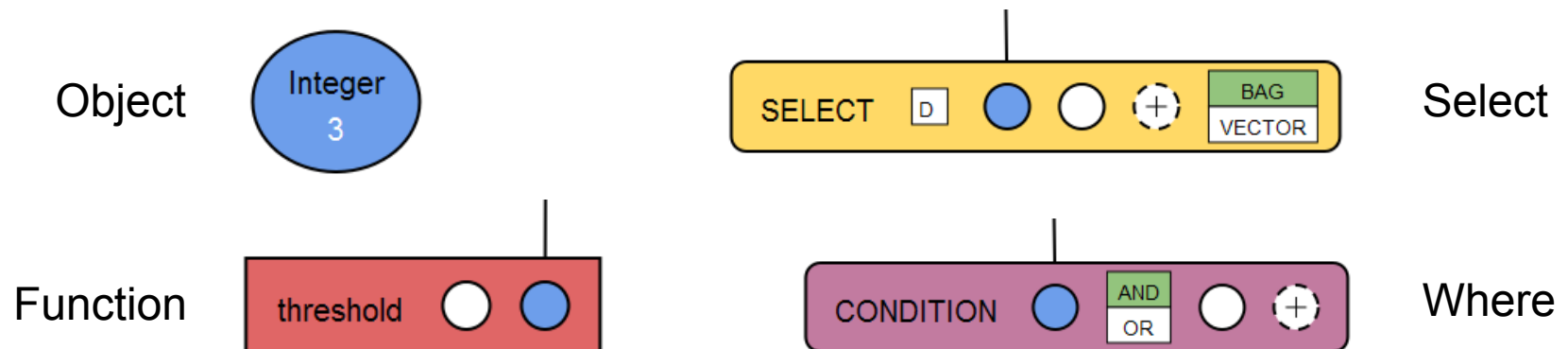
- **Visual Query Language** over Data Streams
- Visual Query **Editor**
- **Visualization** of Data Streams

Visual Query Language

Based on **SCSQL** (Super Computer Stream Query Language):

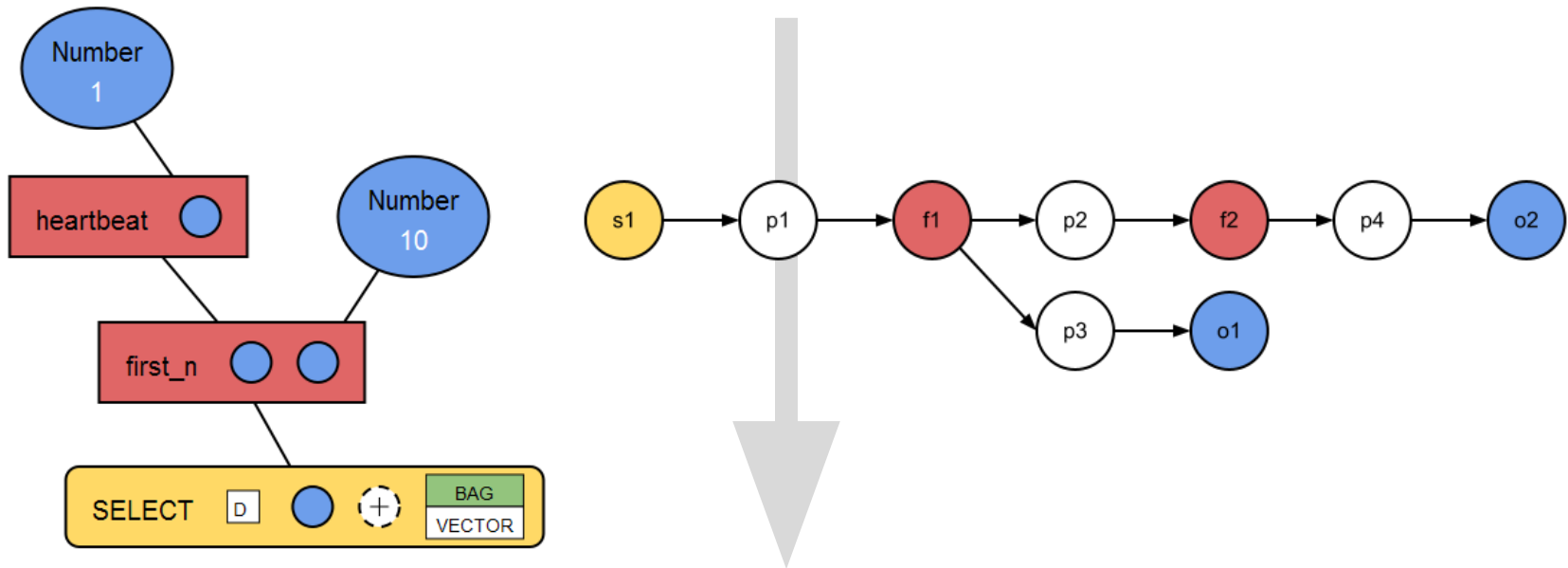
- Developed by Uppsala University
- **Functional, strong typed language**
- SELECT/FROM/WHERE Queries

Visual Query Elements:



Visual Queries Translation

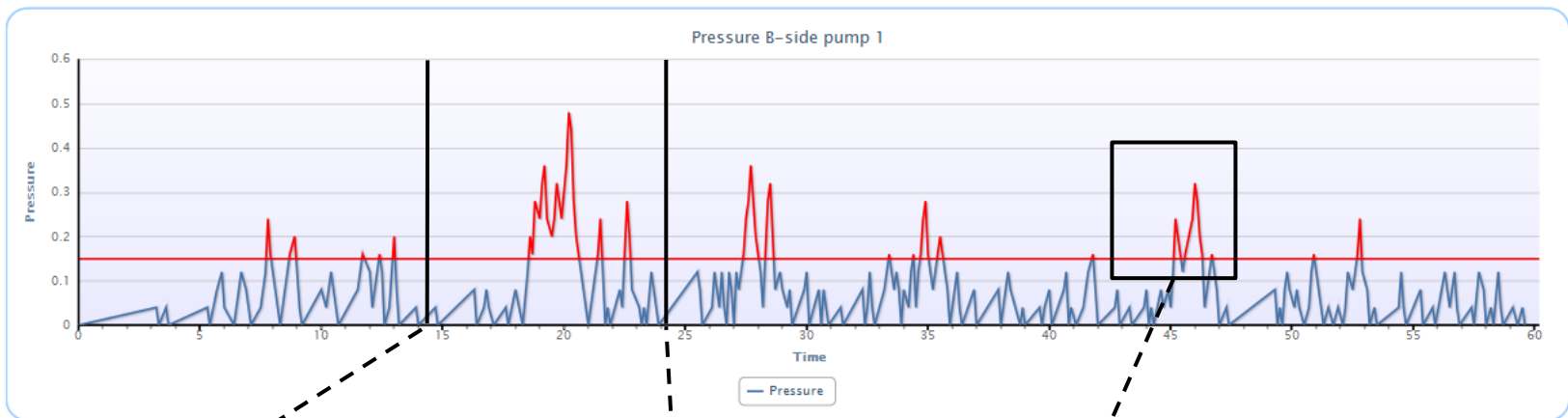
"Every 1 second, emit a progressive value, from 1 to 10."



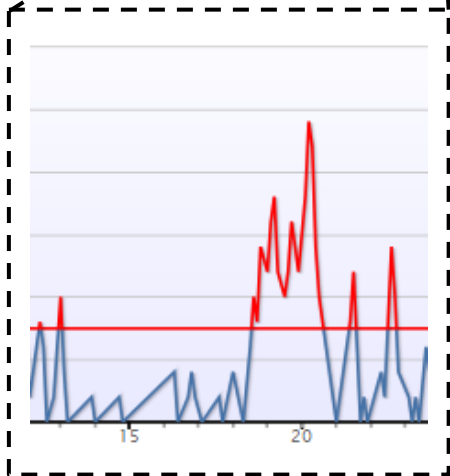
```
select first_n(heartbeat(1), 10);
```

Data Streams visualization

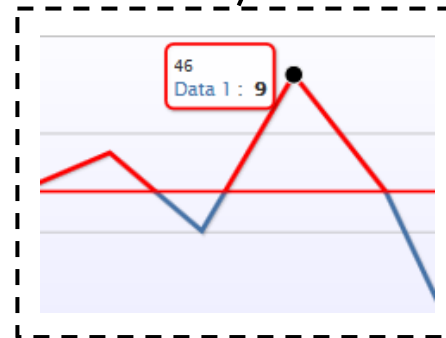
Charts



Zooming



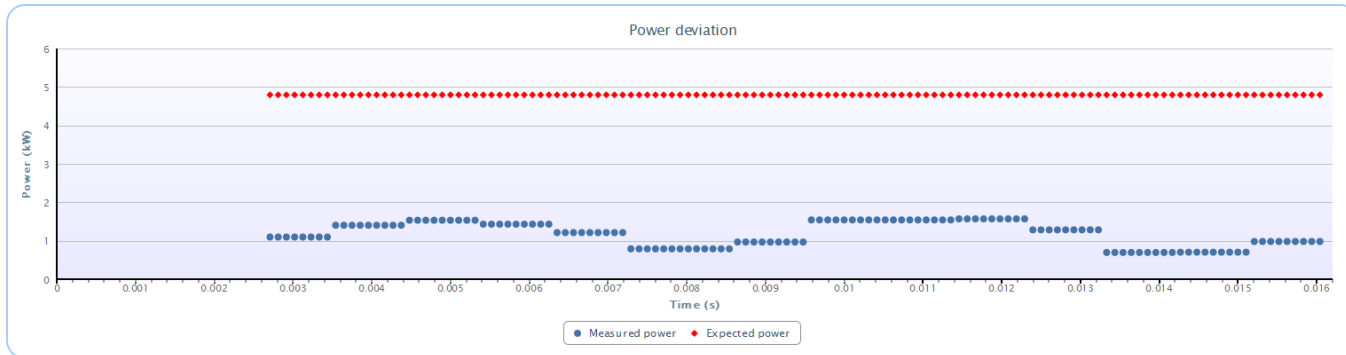
Annotating



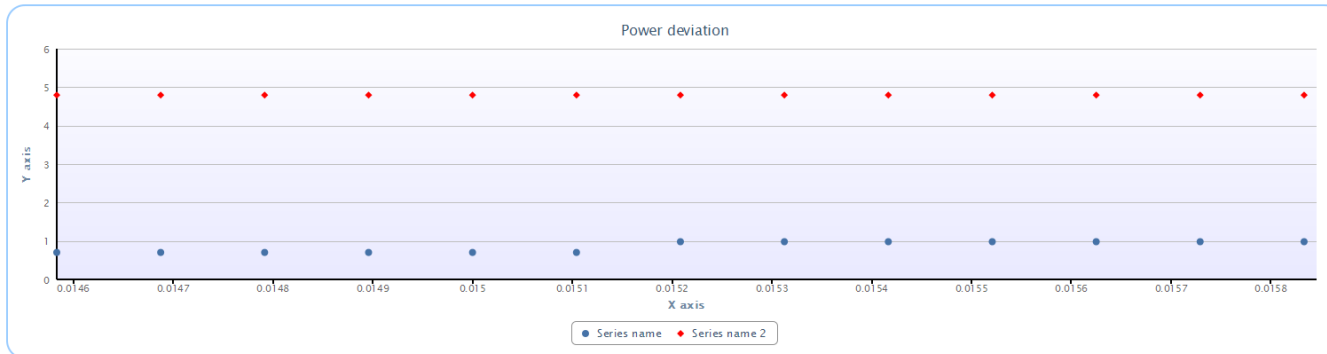
Data Streams visualization

Dashboards

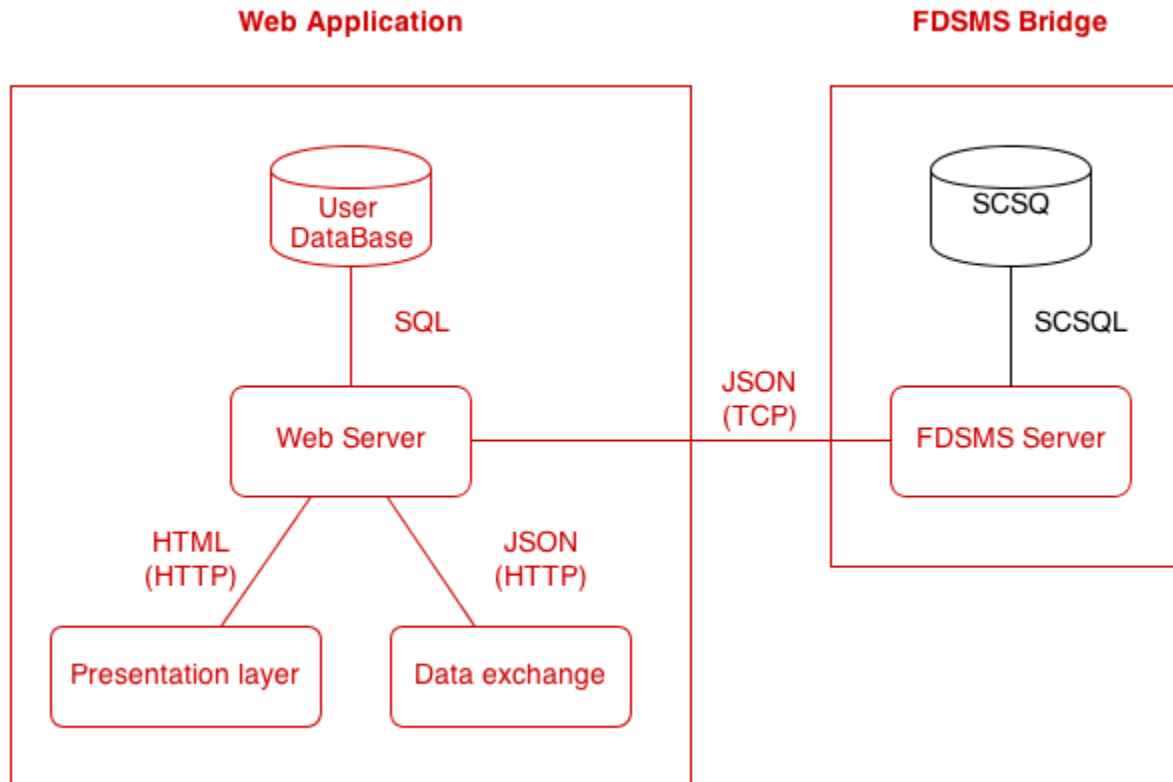
Mill A



Milling machine C



The Prototype



 = My contribution

Demo

Conclusions and Future Works

- Tool to visual query and visualize Data Streams
- Support other SCSQL constructs
- Collaboration
- More platforms
- Usability validation

Thanks.