

openUwedat

The Freedom to Process Any Environmental Observation in the Most Natural Way

> Bojan Božić, Johannes Schabauer, Gerhard Dünnebeil



Sponsors



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Link: carbotraf.eu





Introduction

- Definition of openUWEDAT
 - Data Aquistion System for Environmental Data
 - Long Time Storage and Availability
 - Analysis and Alarming
 - Application wich uses the TimeSeries Toolbox
 - TS-Toolbox is a framework
 - openUwedat is a productline of ready to use applications
- Fields of Application
 - Air Monitoring
 - Water Monitoring
 - Traffic Monitoring



Definition of a Timeseries

A time series is a sequence of <u>data points</u>, measured typically at successive points in time spaced at <u>uniform time intervals</u>.

(Wikipedia 2014)



Definition of a Timeseries Concept of a Datapoint





Definition of a Timeseries Temporal Classification





Pipe Oriented Architecture Simple Pipe





Pipe Oriented Architecture Complex Pipe





Pipe Oriented Architecture Simple Application





Pipe Oriented Architecture Source & Destination





Pipe Oriented Architecture Caching





Formula 3 Introduction

- Works between source and destination
- Describes a timeseries processor
- Comparable to regular expressions: very compact and very powerful
- Usually not longer than one line, but covers functionality of whole pages with normal programming languages
- Seamless integration to TS Toolbox



Formula 3 Primitive Operations

- Multiplication of all Values of a Timeseries with a Constant
 - @A << A[i] * 2>>
- Calculating the Sum out of two Timeserieses
 - @A @B << A[i]+B[i] >>
- Calculating the Difference of two consecutive slots
 - @A << A[i] A[i-1] >>
 - @A << A[i] A[i-1] if A[i-1] != none otherwise A[0]>



Formula 3 Working with Aggregates

- Calculating the floating mean over a logical index
 - @A << mean(A[i-3..i]) >>
- Calculating the Floating Mean over a temporal index
 - @A << mean(A]t-10mins .. t]) >> every
 10 mins



Formula 3 implementation

- Design goal: usable as a "standalone" library on major platforms (Java, .NET, "native")
- Implemented in Python
- TS Toolbox contains Formula 3 running on Jython



The Time Series Toolbox

- A set of API's and software components
- For building services and applications
- That work with time series data (record, store, process, publish ...)





Layered Architecture

- Backend components (Data Sources)
- Processing and control components
- Frontend components (Data Sinks)

SOS Frontend		Universal Data Pump	
Time Series API			
Formula 3		Caching	
Time Series API			
SOS DataSource	CSV DataSource	RRD Datasource	AnySen Datasource



Time Series Toolbox Availability

- Available under dual license: Open source (GPL) and commercial license
- Development release at: <u>http://ts-toolbox.ait.ac.at/</u>
- For more info contact: <u>gerhard.duennebeil@ait.ac.at</u>



Conclusion

- openUwedat supports
 - Multidimensional values of a certain value-type
 - Sematic multidimensionality with the concept of value-keys
 - Regular and irregular timeserieses
- Open interfaces to
 - gather data from various sensors
 - store it in various databases
 - offer other popular interfaces like OGI SOS
- Flexible dataprocessing with
 - Formula 3
 - Custom dataprocessors in any language (e.g. Java, Python)



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Dr. Bojan Božić AIT 2444 Seibersdorf bojan.bozic@ait.ac.at