

OTFVis Tutorial

MATSim User Meeting 2009

David Strippgen

21.04.2009 / TU Berlin

"You can observe a lot by watching" - Yogi Berra

Outline

OTFVis Introduction

Design

File formats

Creating files

Coordinate Systems

OTFVis usage

Starting the OTFVis

Zooming, panning

Preferences

Playback mode

Live mode

Design concepts

Some design criteria for the OTFVis

- ▶ MVC Pattern (Model-View-Controller)
 - abstract data source (data collection) from data display (visualization)
 - easy to extend with own data types
 - minimally-invasive to existing MATSIM code
 - multiple different views onto one data set
- ▶ Java's RMI (Remote Method Invocation) interface and Serializable
 - visualization can read from post-mortem dump (mvi-file)
 - read existing file formats (event files, T.veh files)
 - network connection optionally ssl-encoded
 - simple network infrastructure, easy to transfer to different connection types

Design concepts (continued...)

Some more ...

- ▶ Client-Server architecture
 - simulation can be accessed over a network
 - simulation can be run locally on desktop computer
 - reduce amount of send data to minimum
 - visualization can connect to running simulation (on-the-fly)
 - minimally-invasive to existing MATSIM code
 - multiple different views onto one data set
 - simple network infrastructure, easy to transfer to different connection types
- ▶ OpenGL
 - fast enough for large scenarios
 - take advantage of hardware support for drawing

Input file formats

File formats eaten by OTFVis

- ▶ **mvi**: a movie file containing a visualization of a simulation run
- ▶ **-convert events file**: convert events to mvi file
- ▶ **network.xml**: inspect the network file
- ▶ **T.veh**: will not talk about!
- ▶ **config.xml**: running a live simulation with the visualizer

The latter one being most fun!

How to create a mvi file

Two way to generate a mvi file:

- ▶ **config.xml**: specify in your config.xml before running simulation
- ▶ **-convert**: convert an events file to mvi at any later date

From config.xml

```
<module name="simulation">
  <param name="startTime" value="00:00:00" />
  <param name="endTime" value="00:00:00" />
  <param name = "snapshotperiod" value = "00:01:00"/>
  <!-- 00:00:00 means NO snapshot writing -->
  <param name = "snapshotFormat" value = "otfvis"/>
  <!-- otfvis, netvis, googleearth, transims -->
</module>
```

⇒ Will produce an output of "otfvis.mvi" with the simulation in 1 minute ticks.

From conversion of an event file

```
java -Xmx500m -cp MATSim.jar org.matsim.run.OTFVis -convert event-file  
network-file mvi-file [snapshot-period]
```

⇒ Will produce an output of "<mvi-file>.mvi" with the simulation in <snapshot-period> seconds.

Coordinate Systems

OTFVis is coordinate-system agnostic.

- ▶ takes whatever comes.
- ▶ that is good, if your coordinate system is length preserving.
- ▶ possibly somewhat distorted when it comes to WGS84 coordinates.
- ▶ might get you in trouble with huge spread coord values.

Starting the OTFVis

Tutorial on matsim.org!

<http://matsim.org/docs/userguide/otfvis>

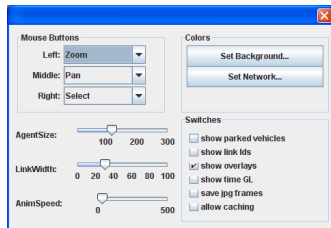
- ▶ For conversion no jogl native library is needed
- ▶ for running the vis the paths must be right
- ▶ Personal recommendation: Run it from Eclipse ;-)

Zooming, panning

The basic movement in the OTFVis

- ▶ **Left** mouse button: draw a rectangle to zoom in/out
- ▶ **Middle** mouse button: hold & drag to translate the view
- ▶ **Wheel**: zoom in/out relative to center point of view
- ▶ **Configure**: the buttons in Preferences...

Preferences dialog



You can edit:

- ▶ **Agent size** The drawing size of the agent's picture
- ▶ **Lane width** How wide is a street being drawn
- ▶ **Background/network colors:** Choose the coloring you prefer
- ▶ **Switches:** Less often used settings, these will differ from version to version

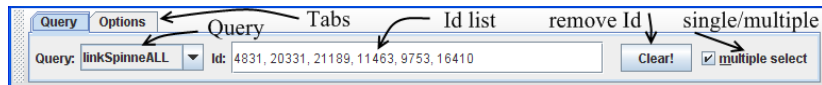
Playback mode



In the Playback of mvi files, the south-end toolbar will help you controlling the animation's playback

- ▶ **Slider** Choose the time displayed by the slider
- ▶ **Block setting** Choose a block to repeat
- ▶ **Cache loading:** Cancel cache loading if not wanted

Live mode



In the live mode, the toolbar to issue queries into the simulation is active

- ▶ **Mouse** right mouse chooses many agents/links
- ▶ **Query** Choose a query to be executed
- ▶ **ID**: Write the agent/link IDs here, or see which were selected by mouse

Questions?
Thank you for your interest!