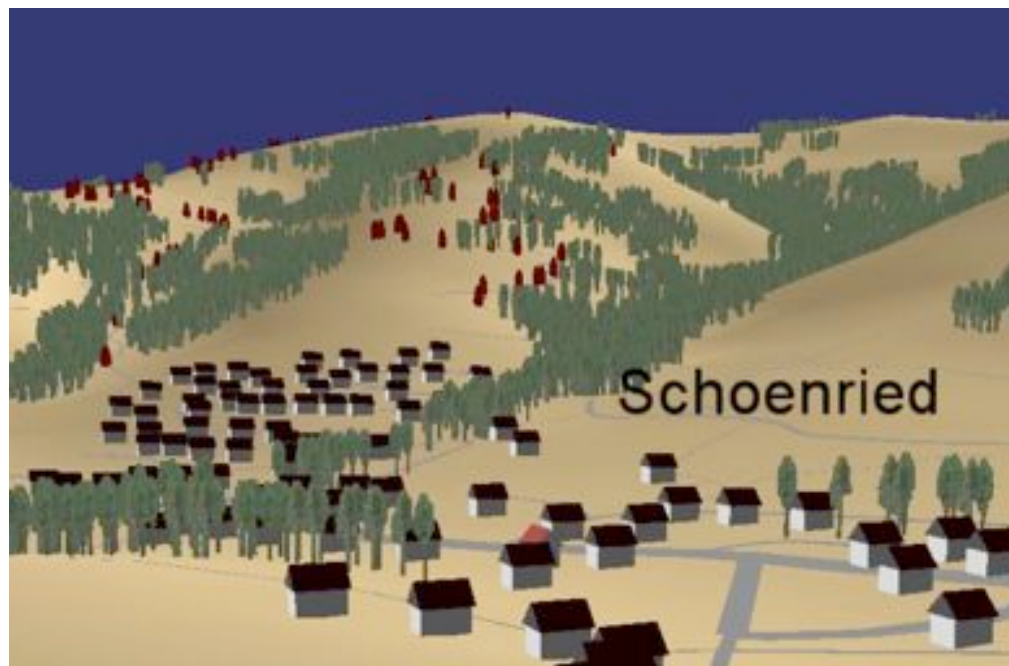


MATSim

Past, Present, Future

1999 – 2004

- Started as collection of stand-alone tools (C/C++ code) in 1999/2000.
- Traffic Simulation and Re-Planning Framework (Çetin and Raney)
- Experiments with Pedestrian Simulation (AlpSim, Zurich Mainstation; Stucki, Cavens, Gloor)
- Experiments with secondary location choice (Marchal, Altenhoff)
- Distributed Simulation with MPI (multiple CPUs, distributed memory)
- Switch from flat-file databases to XML (2003), except Events



- Demand-Modeling Framework in Java
- Databases
 - Counts DB
 - Facilities DB
 - Matrices DB
 - Person Knowledge
- Structures:
 - Controller, Strategy Manager
 - Events Handling
 - Scoring Module

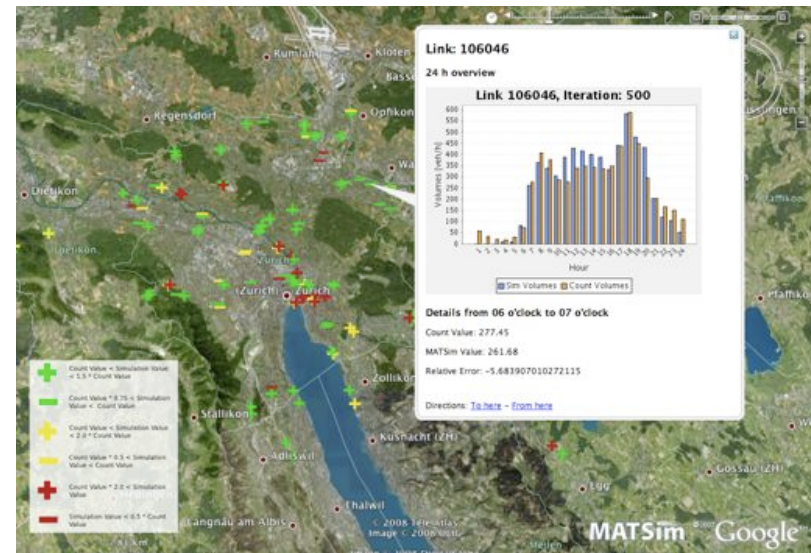
- Organization:
 - MATSim Sourceforge Project
 - Test-Cases (Unit Tests)
 - Website <http://matsim.org/>

The screenshot shows the MATSim website homepage. At the top, there is a search bar and the MATSim logo with the tagline "Multi-Agent Transport Simulation Toolkit". Below the logo, there is a navigation menu with links to Home, Documentation, Downloads, Examples, Publications, and About us. There are also logos for ETH Zurich and Technische Universität Berlin. The main content area is titled "Agent-Based Transport Simulations" and describes the toolbox and its capabilities. It lists key features such as fast dynamic and agent-based traffic simulation, support for large scenarios, versatile analyses and simulation output, a modular approach, a sophisticated interactive visualizer, open source code, and active development. On the right side, there is a "Download MATSim" button and a "START USING MATSIM" section with links to download, run examples, and build scenarios. Below that is a "PROJECT NEWS" section with recent updates and a "Read more news" link.

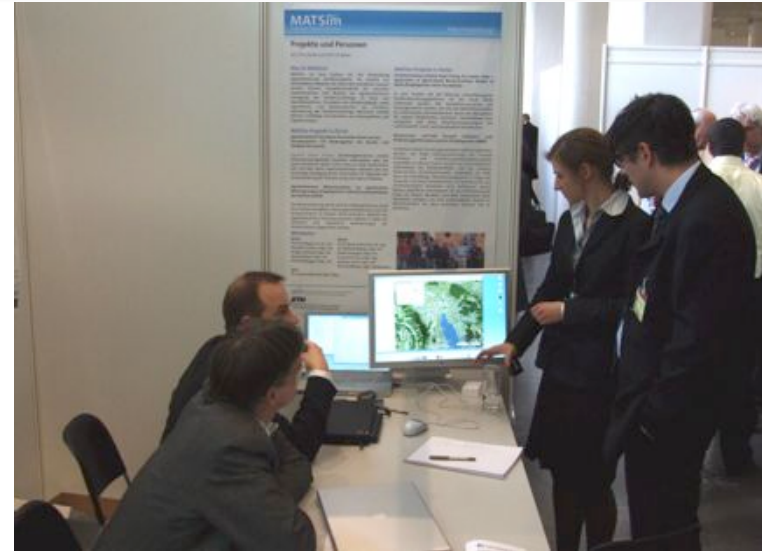
2005 – 2007

- Functionalities:

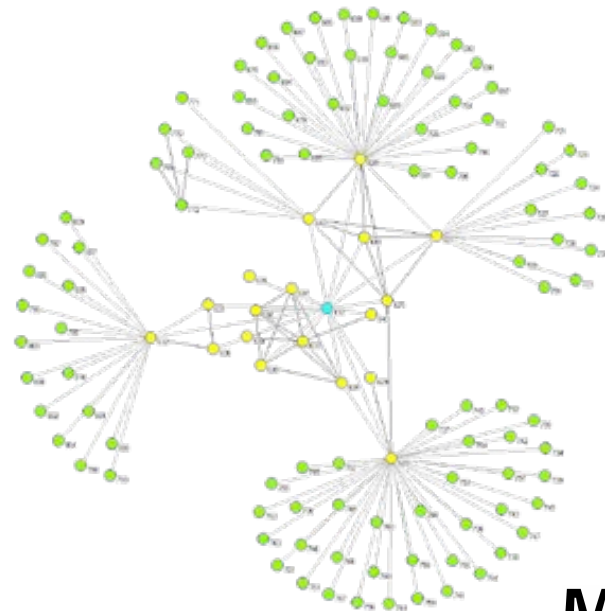
- Porting C/C++ code to Java
- Single-CPU Simulation, multi-threaded Re-Planning
- Fast A*-Landmarks Router
- Support for RoadPricing Scenarios
- Integration of C++ DEQSim and C++ Planomat
- Evacuation
- Automated analyses:
 - Integrated and vastly improved Counts-Comparison
 - Scores, Times, Histograms
 - NetVis, Transims Vis



- MATSim-Booth at Heureka 2008
- First external project (Zürich Westumfahrung)
 - Proven Zurich Scenario
- First external users and scenario (Gauteng, ZA)
- First external, commercial partners (*puls)
- First usage as planning tool in lecture (IVT) with unexperienced students
- Less traffic related projects: Influenza, *puls, Energy & Transport, Social Networks, Retailers, Car Sharing



- Major speedups to QSim
- Secondary Location Choice
- Java planomat
- New, interactive Visualizer (OTFVis)
- Pseudo Mode Choice (temporary)
- (JDEQSim)
- (Social Network)
- (GPS) (Schüssler)
- (Household DB)



Upcoming Features, Already in Work

- More sophisticated replanning-modules:
 - planomat (Time & Mode Choice)
 - Primary Location Choice
 - Activity Chain Choice (Feil)
 - Mental (Route) Maps (Dobler)
- DEQSim in Java / multi-threaded simulation
- Traffic lights (Ou, Grether)
- Additional agents / optimizations, e.g. retailers, car-sharing provider
- Public transport (Router & Simulation)
- More / flexible Events, XML-based events-files
- Improved & personalized Utility Function (Feil, Waraich)

Upcoming Features, Wished For / Planned

- More sophisticated replanning:
 - Exclude freight-traffic from reroute
 - exclude pt from time-adaptation
 - Household strategies
- Other Agents → other Replanning, other U-Functions
- More Details: Parking, Vehicle types
- Post-process analysis
 - Tighter integration into GIS-Applications (data import/export)
 - GPS (Schüssler)
- Within-day Replanning: Para transit, ...
- Facilities as standard? Facility events? Scoring, Replanning, ...?
- Optimization: performance & memory consumption

Non-Features

- More external users?
 - Mathematicians at TUB (Advest Project)
 - Toronto, Canada (Eric J. Miller)
 - Izmir, Turkey? (Yalcin Alver)
 - ?, Japan? (Wisinee Wisetjindawat)
 - Melbourne, Australia? (Stephan Winter, 2010 at earliest)
- New scenarios:
 - Padang, Lyon, ?Berlin, ?Japan, ?Toronto, ?Izmir, ?Melbourne

Challenges (1/2)

- Growing developer community
 - Provide Support
 - Communication (mailing lists, forum, wiki, ...?)
 - Stabilize API
 - Meetings / Seminar:
 - More space, more topics, more attendees (from different countries)
 - Conference, Convention?
 - Ensure code quality (“core” vs. “contributed”)
 - Ensure scenario quality (do the additional replanning modules really help to improve scenarios? And do external users use MATSim how they should?)

Challenges (2/2)

- Publicity
 - How much publicity do we want?
E.g. we could announce the Gauteng-Scenario as “news” on the Website. But: more publicity \approx more emails/support.
- Bigger Scenarios
 - What optimizations are required, which one possible?

Thanks for your attention!

Questions? Comments?

ETH

Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

Technische Universität Berlin



MATSim
Multi-Agent Transport Simulation