Welcome to Zurich / Willkommen in Zürich

Marco Luethi
Daniel Huerlimann

OpenTrack
User Conference
January 24, 2008
Agenda

- Introduction of the participants / Vorstellungsrunde
- Release notes
- Presentation of version 1.5 of OpenTrack / Präsentation der Version 1.5 von OpenTrack
- Key features / wichtigste Neuerungen
- Short demo / kurze Demo
OpenTrack - an ETH Zurich spin-off company

OpenTrack Railway Technology Ltd.
c/o Institute for Transport Planning and Systems
CH - 8093 Zürich, Switzerland

A spin-off company of ETH Zurich is a newly founded company based on research results of ETH Zurich in which ETH employees or graduates participate.
Train Categories: Running time distribution

Trains on time:
- 89.0% to 90.0%: 2.5% of the time
- 90.0% to 91.0%: 7.5% of the time
- 91.0% to 92.0%: 10.0% of the time
- 92.0% to 93.0%: 22.5% of the time
- 93.0% to 94.0%: 30.0% of the time

Delayed trains:
- 100.0% to 100.0%: 100.0% of the time
Distribution (Type: piecewise linear)

Performance Factor (on time)

Probability
Train Categories: Running time distribution

Distance / Distanz

Speed / Geschwindigkeit

km/h

OpenTrack - Simulation of Railway Networks
Daniel Huerlimann
IVT - ETH Zurich

UST NAEN SCWE DUE CHRI NGUT STET ZHOT ZSTH ZMUO ZMUS ZLST

[km]
Train Categories: Running time distribution
Dispatching

Priority in function of time

Route setting (offensive/defensive)
Dispatching (Local Dispatching 1)

Signals: Dispatching Delay

Station Y

P15000
X2000

Signals: Dispatching Delay

Station Y

P15000
X2000
Dispatching (Local Dispatching 2)

Signals: Dispatching Priority

Station Y

Signals: Dispatching Priority

Station Y
Incident sets

New table
Periodic incidents

Periodic edge incident

Period:
40 s ON, 10 s OFF,
50 s ON, 15 s Off
Periodic incident: Example crossing

crossing with individual traffic

Tram: 10 min. interval, Moving Block
Route: Discrete for Mov. Block Operations
Periodic incident: Output speed/distance

No disturbance

Braking / reacceleration

Stop
Periodic incident: Output occupations

**Braking / reacceleration**

- **Upper Track**
  - 08:00: System
  - 08:01: Tram.2
  - 08:02: System

- **Lower Track**
  - 08:10: System
  - 08:11: Tram.1
  - 08:12: System

**No disturbance**

- **Upper Track**
  - 08:10: Tram.4
  - 08:11: System

- **Lower Track**
  - 08:10: Tram.3
  - 08:11: System
Blocking-time stairways (per direction)
RailML timetable import and export

- Time filter
- Station ID converter
OpenPowerNet - Electrical network simulation

Interprocess Communication
(TCP/IP, SOAP, RailML)

Railway Simulation

Electrical Network Simulation

OpenPowerNet
OpenPowerNet - Electrical network simulation

- Precise railway operation simulation
- Co-simulation with electrical network calculation
- Online-communication between operation and electrical network simulation
- Retroaction of electrical network calculation to train driving dynamic
- Comprehensive analyzing and interpreting tools (energy, load flows, currents, voltages)
Questions and Answers
Demo