An Agent-Based Demand-Modeling Framework for Large Scale Micro-Simulations

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Overview

MATSIM-T

MATSIM-T Process Steps

IIDM Kanton Zurich

Outlook
MATSIM-T (Multi-Agent Transportation SIMulation Toolbox)

Agent Initialization (MATSIM-INI)
- Population Modeling (MATSIM-POP) to create agents
- Individual Initial Demand Modeling (MATSIM-IIDM) to create demand

Analysis (MATSIM-ANALYSIS)
- Validation
- Visualization
- Comparison
- Calibration

Data Preparation (MATSIM-DATA)
- Data Base (MATSIM-DB)
  - World DB
  - Network DB
  - Facilities DB
  - Matrix DB
  - Census DB
  etc...

Iterative Demand Optimization Process - Evolutionary Algorithm (MATSIM-EA)
- Scoring functions (MATSIM-SCORES)

Strategy Modules (MATSIM-STRATEGY)
- use by
- change
- mutate

Execution (MATSIM-EXEC)
- use by

Data Fusion & Consolidation (MATSIM-FUSION)
- use by
- fuse

etc...

world xml
network xml
facilities xml
matrix xml
census xml
plans xml
etc...
MATSIM-T Process Steps

MATSIM-POP
Frick, 2004

MATSIM-POP

plans
xml

world
xml

network
xml

facilities
xml

matrix
xml

MATSIM-DATA

MATSIM-DB

Agent DB

World DB

Network DB

Facilities DB

Matrix DB

MATSIM-FUSION
Balmer, et al., 2006

MATSIM-INI

MATSIM-HIDM
Balmer, et al., 2006

MATSIM-DB

Agent DB

network
xml

init-plans
xml

Calibration
Bernard, et al., 2006

MATSIM-DB

Agent DB

optimized-plans
xml

events.txt

MATSIM-EXEC

stochastic, queue based agent traffic simulation (Cetin, 2005)

MATSIM-STRATEGY
planomat (Meister, et al., 2005) router (Raney, 2005)

MATSIM-SCORES
Charypar and Nagel, 2005
M. Balmer

IIDM Kanton Zurich (1)

MATSIM-DB
Agent DB
- person attr.
- home loc. (R)

MATSIM-INI
MATSIM-IIDM
mapping

MATSIM-DB
Agent DB
- person attr.
- home loc. (R,M)

World DB

MATSIM-DB
act-chain distr.

MATSIM-INI
MATSIM-IIDM
act-chain alloc.

MATSIM-DB
Agent DB
- person attr.
- home loc. (R,M)
- act-chain
- prim-act loc. (M)

MATSIM-INI
MATSIM-IIDM
prim act loc choice

MATSIM-DB
Agent DB
- person attr.
- home loc. (R,M)
- act-chain
IIDM Kanton Zurich (2)

MATSIM-DB
Agent DB
- person attr.
- home loc. (R,M)
- act-chain
- prim-act loc. (R,M)

MATSIM-INI
MATSIM-IIDM
distribution

MATSIM-DB
Facilities DB

MATSIM-DB
World DB

MATSIM-INI
MATSIM-IIDM
sec act loc choice

MATSIM-DB
Agent DB
- person attr.
- home loc. (R,M)
- act-chain
- prim-act loc. (R,M)
- sec-act loc. (R)
Outlook (now)
Outlook (future)

MATSIM-T (Multi-Agent Transportation SIMulation Toolbox)

Iterative Demand Optimization Process - Evolutionary Algorithm (MATSIM-EA)

Data Base (MATSIM-DB)

Agent DB contains: description, knowledge and demand of each person

World DB
Network DB
Facilities DB
Matrix DB
Census DB
etc...

Scoring functions (MATSIM-SCORES)

Execution (MATSIM-EXEC)

Strategy Modules (MATSIM-STRATEGY)

Person Strategies
Infrastructure Strategies
Demand Strategies
Household Strategies
etc...

Matrix DB
Facilities DB
Network DB
World DB

used by

to score

used by

used by

change mutate

used by

used by

used by

used by

M. Balmer
Literature


