Preferred citation style

MATSim-T: An overview

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Structure

Software:

• Open-source project under GNU public licence

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What does MATSim-T currently do?

Demand $q$ are the $i^{th}$ movements of person $p$ from the current location at time $t$ on route (connection) $r$ to location $j$. The resulting generalised costs $k$ are used to adjust the schedules and to change the capacities $C$ and prices $P$ of facilities $f$. 

\[
q_i \equiv (t,r,j)_{i,n}
\]

\[
k(t,r,j)_{i,n}
\]

\[
\beta_{i,t,r,j,k}
\]
MATSim-T: Scale and approach

- Scale: $10^7$ agents, $10^6$ facilities, $10^6$ links and nodes
- Continuous time resolution
- Trip-based resolution of movement

- Shared time-of-day dependent generalised costs of travel and activity participation
- Queuing for slots for movement and activities

- Best-response/choice models for schedules
  - Best-response models for schedule and route construction
  - Choice models for locations
Current configuration: Initial demand generation

- **Number and type of activities**
- **Sequence of activities**

  - (Rough) start and duration of activity
  - Composition of the group undertaking the activity
  - Expenditure division
  - **Location of the activity**

  - Connection between sequential locations

    - Location of access and egress from the mean of transport
    - **Vehicle/means of transport**
    - Route/service
    - Group travelling together
    - Expenditure division
Current configuration: (Iterative) activity scheduling

- Number and type of activities
- Sequence of activities
  - Start and duration of activity
  - Composition of the group undertaking the activity
  - Expenditure division
  - Location of the activity
- Connection between sequential locations
  - Location of access and egress from the mean of transport
  - Vehicle/means of transport
  - Route/service
  - Group travelling together
  - Expenditure division
End of 2009 configuration: (Iterative) activity scheduling

- Number and type of activities
- Sequence of activities
  - Start and duration of activity
  - Composition of the group undertaking the activity
  - Expenditure division
  - Location of the activity
- Connection between sequential locations
  - Location of access and egress from the mean of transport
  - Vehicle/means of transport
  - Route/service
  - Group (household members) travelling together
  - Expenditure division
Issues: Getting new users/scenarios started?

- Tools for migrating from existing transport models
- Tools to capture diverse land use/parcel information
- Translators/cleaners for navigation networks
- Population generator(s)
Issues: Numerical and conceptual questions

• Equilibrium or development paths?

• Nature of the equilibrium (“Schedule” inclusive of Wardrop?)
  • Number of iterations to equilibrium
  • Quality of the equilibrium
  • Uniqueness of equilibrium

• Scalability: $10^8$ agents, $10^7$ facilities, $10^7$ links?
Issues: Utility function and parameter estimation

- Competition for slots on networks and in facilities
- Activity scheduling
- Parameter calibration

- Observed schedules and generalised costs

\[ k(t, r, j)_{i,n} \]

\[ q_i \equiv (t, r, j)_{i,n} \]

\[ \beta_{i,t, r,j,k} \]
Issue: Endogenous supply generation

- Locating, sizing, and pricing of slots
- Competition for slots on networks and in facilities
- Mental map
- Activity scheduling (private, commercial)

- $k(t,r,j)_{i,n}$
- $C_f(t); P_f(t)$
- $q \equiv (t,r,j)_{i,n}$
- $k(t,r,j)_{i,n}$
Issues: Running MATSim

- Training for MATSim
- Integration of new actors

- Software engineering for loosely coupled developers
- Integration and quality control of new code
- Funding for system integration

- (Daily) coordination of the project as whole

- Maintaining scenarios (commercially)
More information

www.matsim.org