Preferred citation style

Axhausen, K.W. (2009) MATSim-T: An introduction, presentation at the 1st MATSim Users' Group Meeting, Berlin, April 2009.

MATSim-T: An overview

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April 2009

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Institute for Transport Planning and Systems

ETH
Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

Structure

Software:

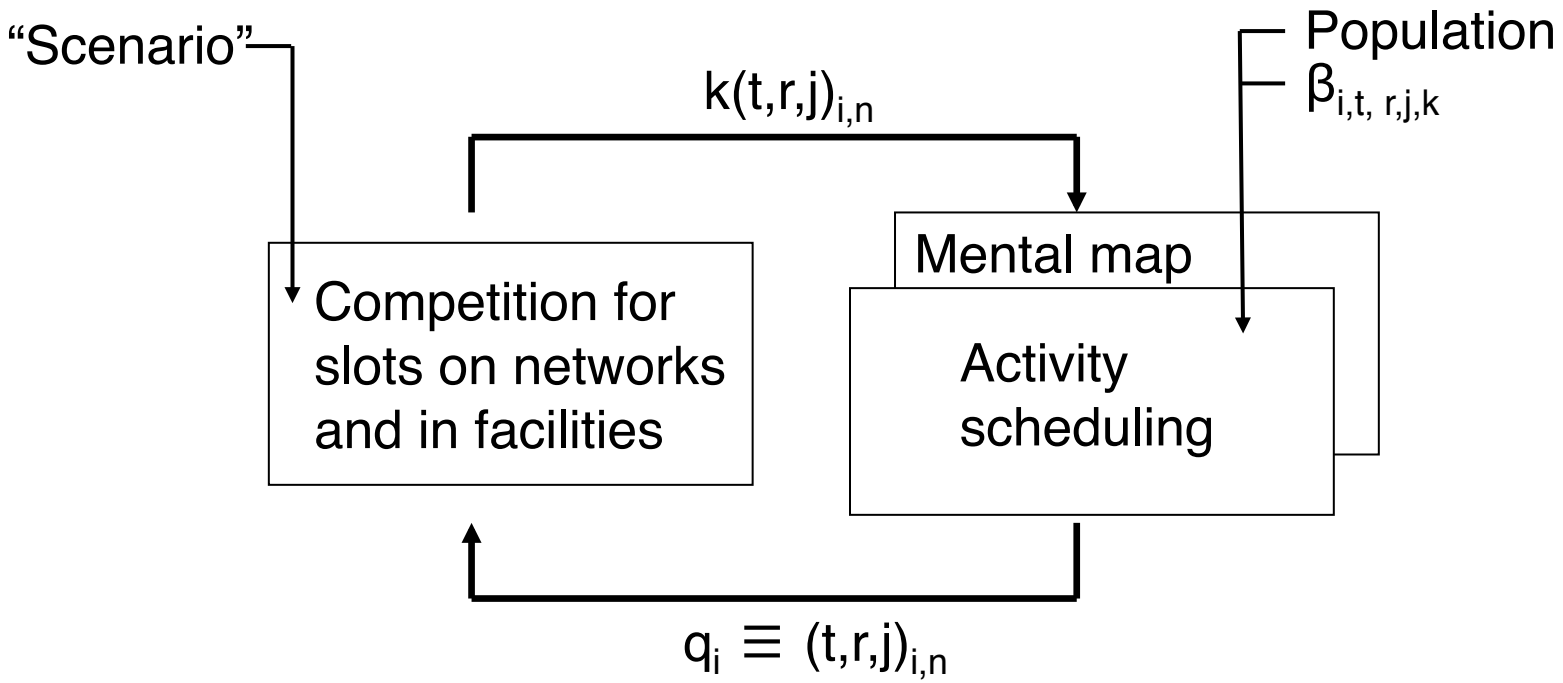
- Open-source project under GNU public licence

Coordination:

- Kai Nagel, TU Berlin
- Kay Axhausen, ETH Zürich

- Michael Balmer, ETH Zürich
- Marcel Rieser, TU Berlin

What does MATSim-T currrently 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

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)

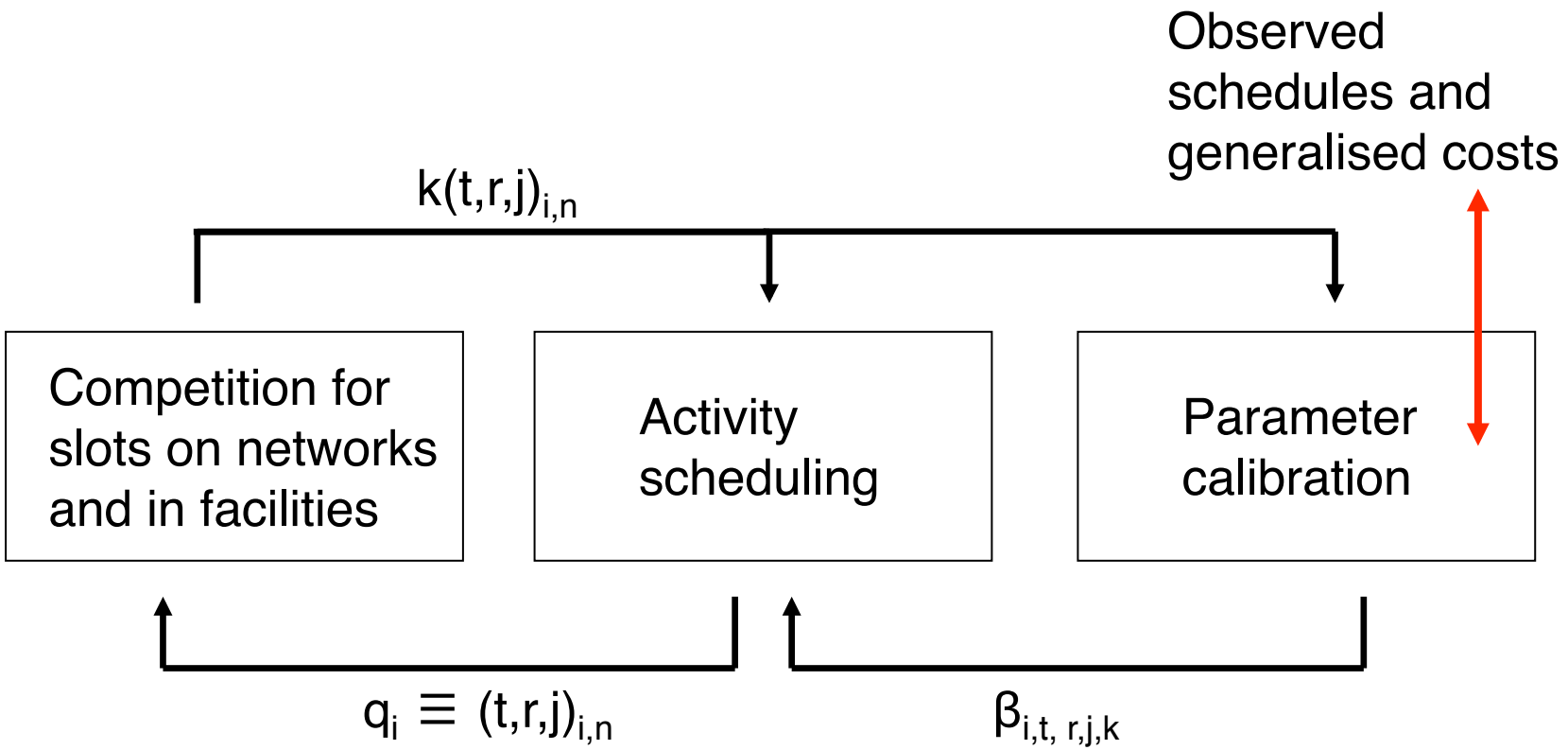
Issues: Numerical and conceptual questions

- Equilibrium or development paths ?

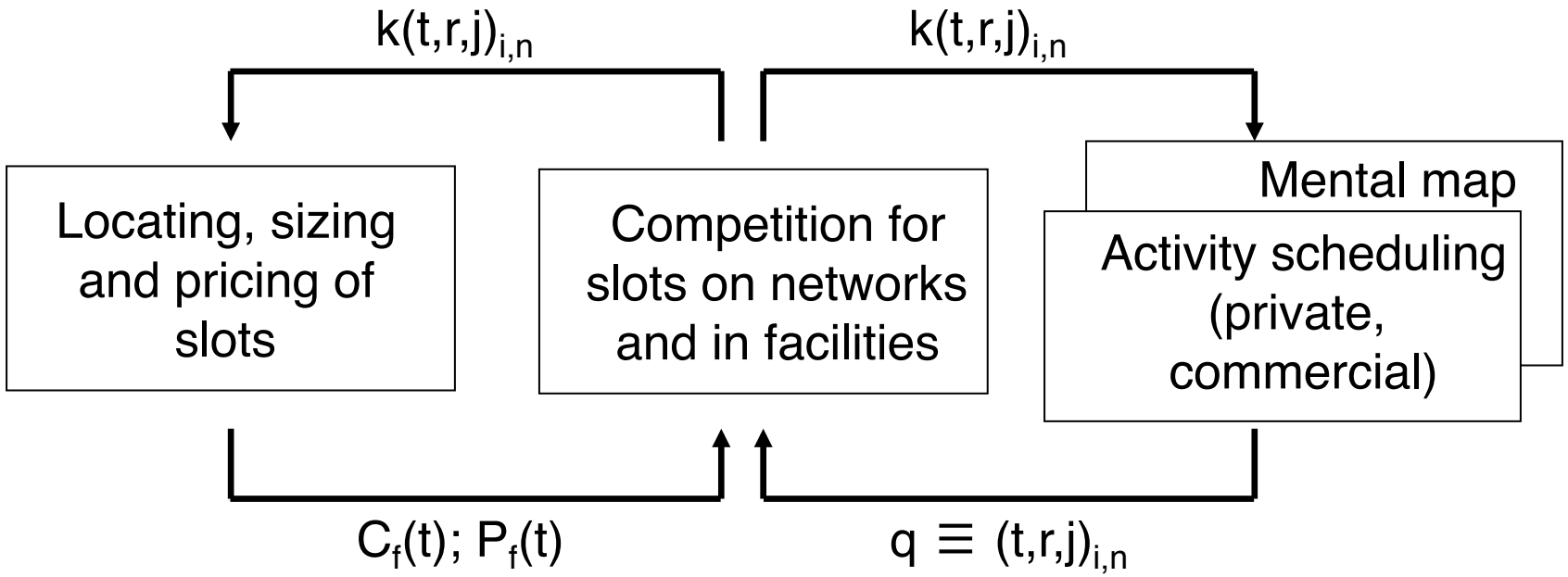
- Nature of the equilibrium ("Schedule" inclusive of Wardrop ?)
- Number of iterations to equilibrium
- Quality of the equilibrium
- Uniqueness of equilibrium

- Scalability: 10^8 agents, 10^7 facilities, 10^7 links ?

Issues: Utility function and parameter estimation



Issue: Endogenous supply generation



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