DAFNI Roadshow UCL – Urban model OpenMOLE now on DAFNI

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Location: Virtual Event

22nd November 2021
14:00-16-45 pm

University College London

Introduction
Models of Urban Infrastructure and Transport

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- Computing has developed into a very large range of different environments on which to undertake analysis, simulation, & forecasting

- No collective term as such but we can refer to these as *platforms*

- **DAFNI** which stands for **Data and Analytics Facility for National Infrastructure** is such a resource – almost *a meta-platform* designed to offer a wide range of computing facilities to those involved in modelling national infrastructure.

- Origins in **UKCRIC** funded by **UKRI**

- Specific origins are in ITRC Mistral, longstanding consortium project run by Jim Hall from Oxford

- DAFNI is funded several million over last four years and located at Harwell Rutherford Appleton Lab as part of the **STFC** - Science and Technology Facilities Council – variety of other platforms

- **Why Infrastructure? What do we mean by this ?** generally use this to embody physical infrastructure which our towns and cities are built of - roads, utilities, rail, telecoms,

- But wider than this – movement and location of all kinds – today look at movement of peoples ---- **Juste Raimbault** – one of our **DAFNI champions** is developing a short project to demonstrate how a certain class of microsimulation models work. ABM models.

- He and we in CASA at UCL have developed what is one of the most sophisticated transportation models called **MATSIM** from ETH & TU Berlin

- Divide models of transport and cities into a strategic level and people level – into more **aggregate models** that deals with flows and volumes of people movement and disaggregate or **agent-based models** of actually individuals moving. ABM have enormous data requirements
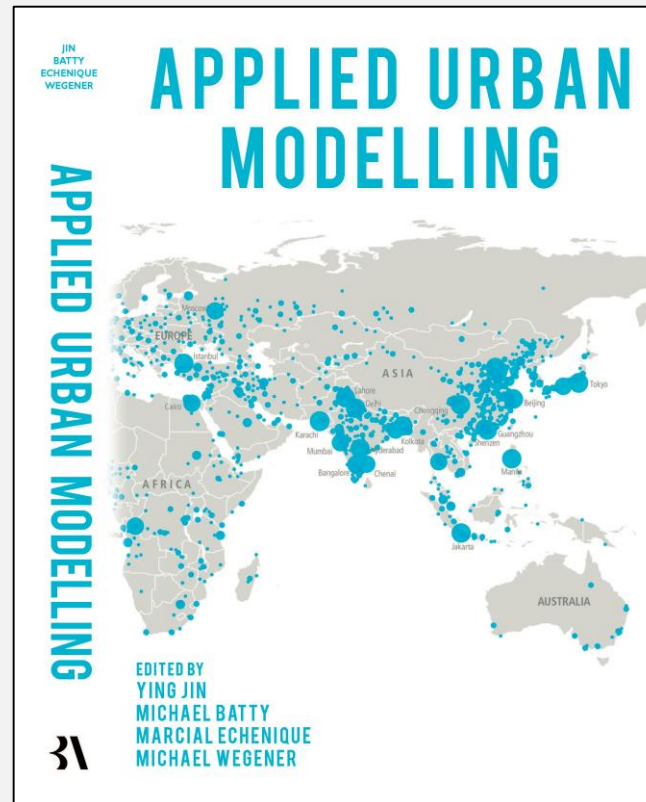
- **MATSIM** developed by **Kay Axhausen** and **Kai Nagel** from **ETH** and **TU Berlin**. It originates from such a model built at Los Alamos in the early mid 1990s called TRANSIMs which was then ported to ETH Zurich by Kai Nagel and then developed by him and his colleague the transport planner Kay Axhausen

- We have a version for London

- Now the version that Juste is developing and porting to DAFNI is an extension to deal with the pandemic – called **MATSIM-EpiSim**

- This model or a variant of this has been developed by Gerry Casey and colleagues at the **City Modelling Lab** in **Arup** for **Transport for London** over the last 2 years and it being used by TfL to look at the pandemic – their version is not publicly available for a variety of reasons – confidentiality is one but other issues about the spread of the pandemic into different parts of the transport etc.

- I should say a little more about urban models – long lineage from the 1950s originally – land use transportation models – one of these developed by Simon Blainey from Southampton developed for UK as part of ITRC. Another developed by Ali Ford at Newcastle as part of the focus on urban development. A third SPENSER based on microsimulation with its own platform by Nik Lomax at Leeds

- We have a model for the UK (well, E, S, W) which is called **QUANT** and this is really a platform in its own right. It poses the question which is all about how DAFNI works as to how you can take someone else's model and their platform and use the DAFNI resources appropriately. It is a moveable feast – DAFNI is developing all the time

- To give you an idea – these models can be used to look at different scales – aggregate nationally mainly so far, but **urban observatories** and **smart cities type models** and data at much finer scale – extensions of data **to real time data**. This is a current major thrust.
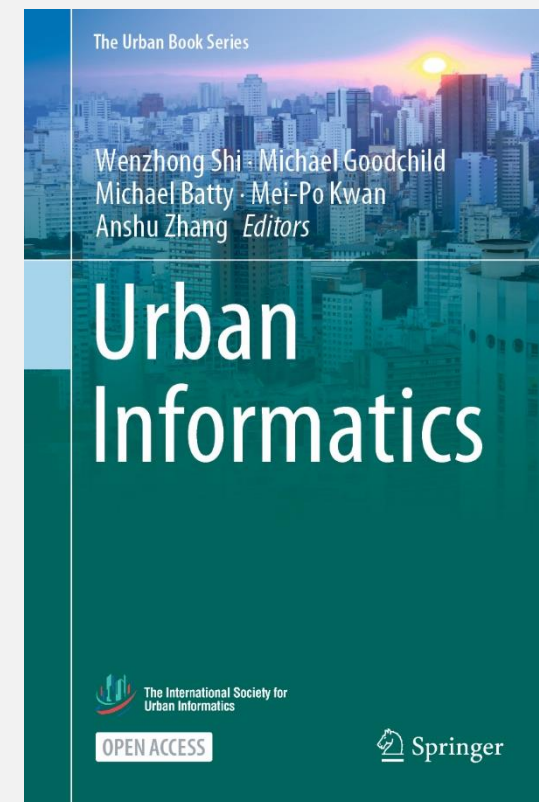
- I have said enough and now hand over to Brian who will explain how DAFNI works and how one can use it and get access to it – then Tom followed by Juste – MATSIM and Open Mole software and then our guests, the originators Denise Pumain and Romain Reuillon from Paris
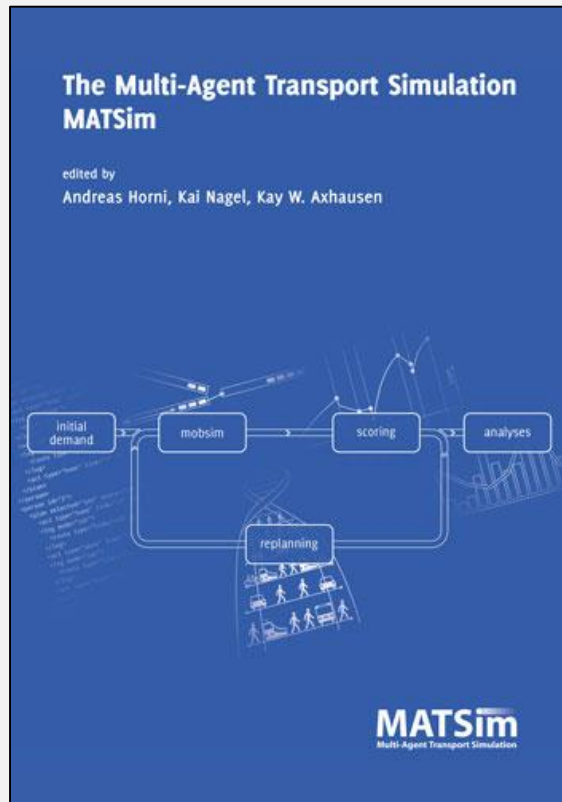
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