Linking Microsimulation and LUTI models

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Context

Outline

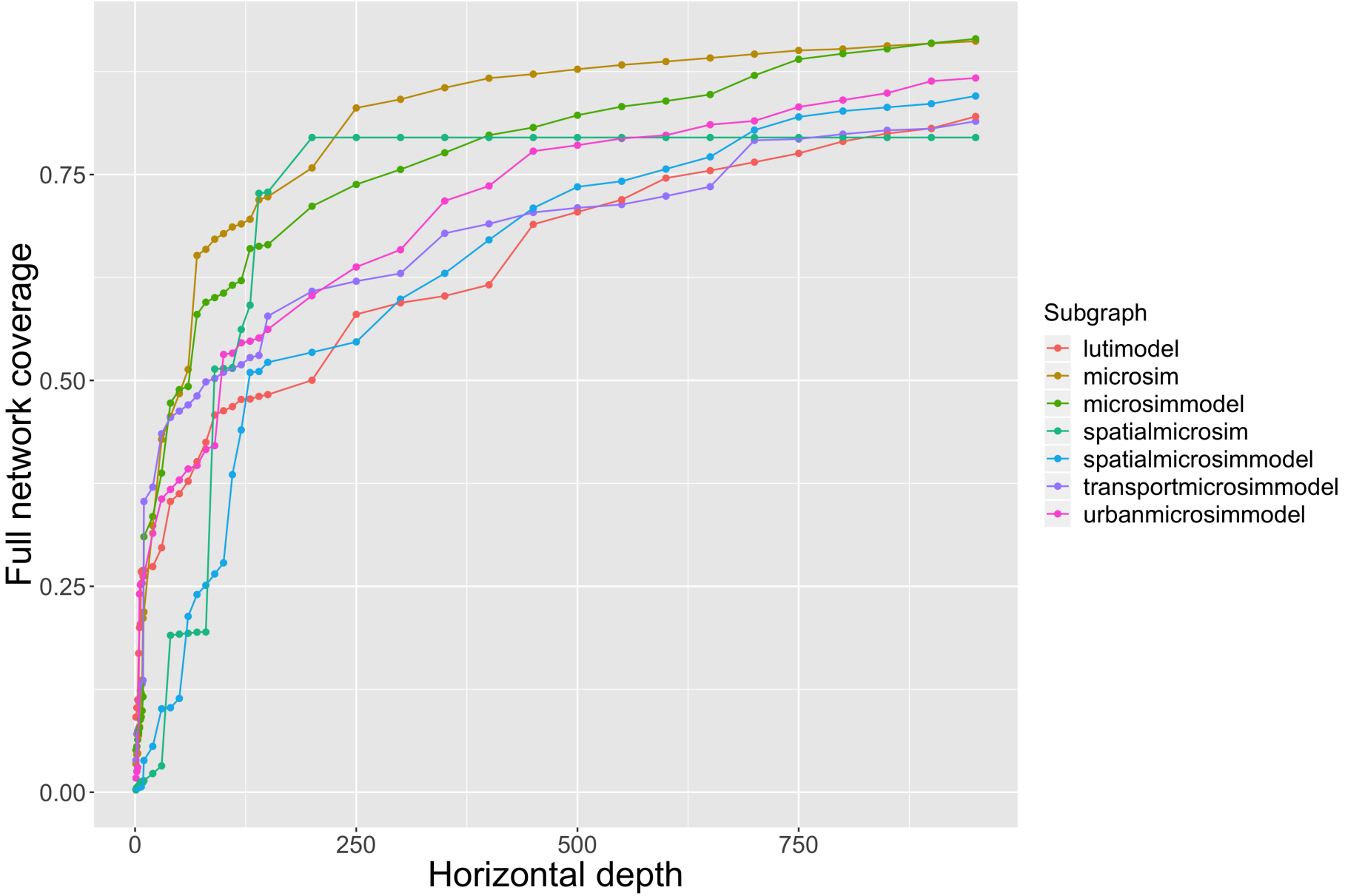
1. Literature mapping
2. Specific definitions
3. Description of SPENSER
4. Coupling QUANT and SPENSER: prospects
5. Sensitivity analysis

Citation network analysis

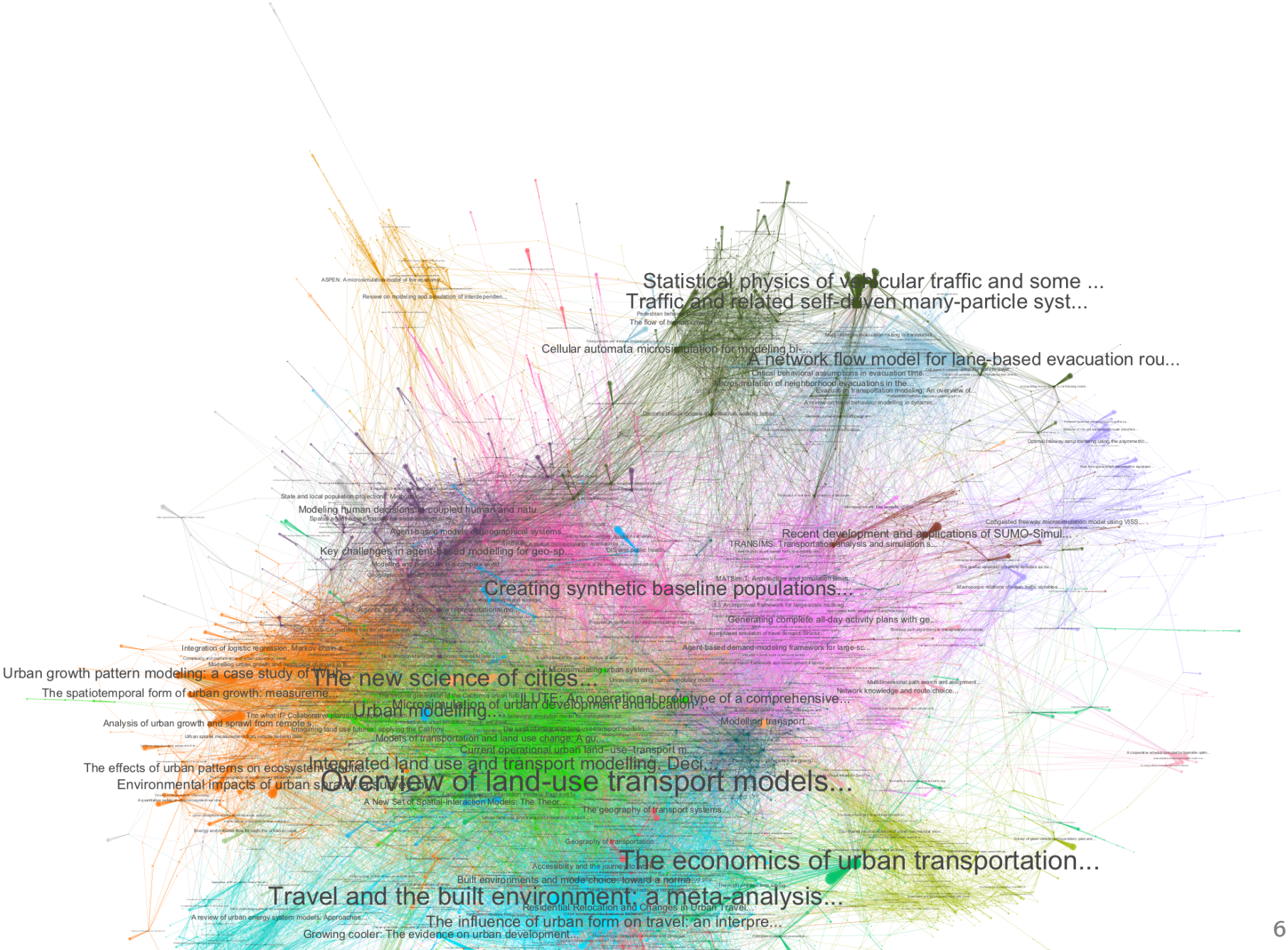
- Urban modeling in general very broad on models used and how to name them
- What are existing existing/potential connections between approaches?

$\rightarrow$ *a systematic review and citation network exploration around our main entries (microsimulation and luti)*

Coverage of the citation network



Citation network



Core communities

General purpose

Individual and household-level simulation of population
$\rightarrow$ test policies and scenarios at the UK-level

Modules:

- Synthetic population generator
- Dynamic micro-simulation library
- Simim, spatial interaction library

Synthetic population generation

Dynamic microsimulation

Spatial interactions

Technical aspects

Comparison of properties

	QUANT	SPE
Time scale	10 years *1	30 y
Spatial scale	UK	UK
Spatial resolution	MSOA	War
Agent granularity	Aggregated counts	indiv
Static/Dynamic	Equilibrium (static)	Dyn
Randomness	Deterministic	Mon
Process: Transportation	3 modes *3	NA
Process: Economic activities	Accessibility-based relocations	NA
Process: Demographics	NA	Data
Process: Migration flows	Accessibility-based relocations	Data

*1 stylized time scale of metropolitan relocations [**?**]

*2 model structure is however stationary - this is an important issue for a possib

*3 discrete choice for transportation mode is not implemented in QUANT

*4 probabilities of basic demographic events (ageing, mortality, fertility, househ computed from data

Alternatives for coupling

- Weak coupling Luti $\rightarrow$ microsimulation
- Weak coupling Microsimulation $\rightarrow$ Luti
- Strong coupling

$\rightarrow$ technically achieve one weak is a first requirement ; also requieres sensitivity analysis
$\rightarrow$ strong coupling can be seen as building a new model

Sensitivity analysis of SPENSER

Sensitivity analysis of QUANT

Computational experiments using OpenMOLE

Running OpenMOLE on DAFNI

Conclusion: roadmap

References I