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Visual analysis design to support research into movement and use of space in Tallinn: A case study

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Visual analysis design to support research into movement and use of space in Tallinn: A case study

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Planning in Tallinn, Estonia

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Motivation

- Understand **urban sprawl** in Tallinn
- Through studying **spatial mobility** of suburbanites
- By interpreting their **temporal connections** to the city centre and the consumption of **land-use space** in the city

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Visualization options

Density

Geographic counts

Counts by landuse

Temporal rhythm

Individual overview

Space-Time Cube

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Qiuju Zhang's approach

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Tasks

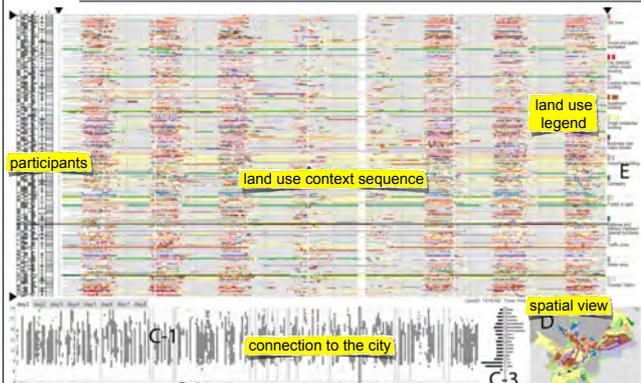
- **Identification** refers to searching for data values or movement patterns at the given location and time
 - "How many persons have regular connection to the city centre?"
- **Localization** looks for when and where data values or movement exhibit patterns
 - "Which geographical locations and land-use types are connected with jobs of suburbanites?"
- **Comparison** determines what relations exist between data components
 - "How diverse are the destinations and land-use functions during regular trips to city?"

Getting insight

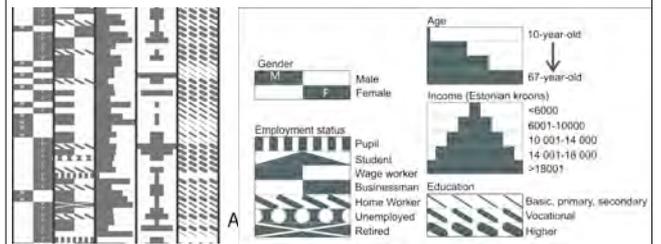
- Temporal connections to the city: temporal periodicity
- Land-use consumption in the city: movement sequences and durations
- Social characteristics of the phone users: different professions



The 'prototype'



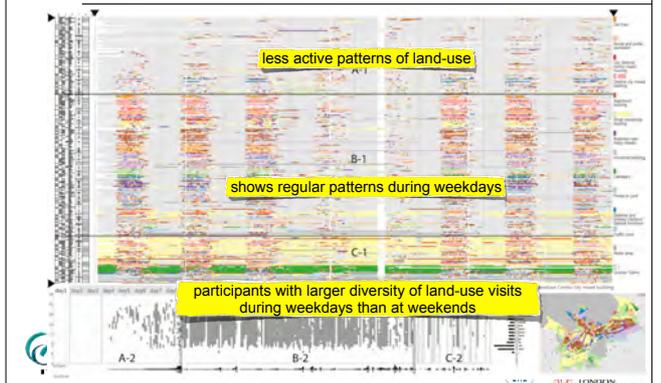
Participant and sequence view



The dynamic legend shows land-use types (A) and the total length of stay over 8 days of the identified participant (B)



At work





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Feedback

- Useful and has high relevance because of end-user friendly design and very high demand for monitoring tools in the urban planning process.
- The design for **identification** and **localization** tasks can be used directly in urban researches and planning applications.
- The design for **comparison** tasks is good to motivate suitable research questions for further analyses



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Qiuju's next steps

- To incorporate data sets with different spatial and temporal granularities
- Combining sequence analysis functions
- Empirical cognitive studies that examine the effectiveness of using the prototype to address user tasks

- Write a thesis.....



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