

# Urban spatial data analytics in urban design and planning

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## Summary

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*TalTech Academy of Architecture and Urban Studies opens a PhD position in a research project concerning future urban technology mediated cities. The cooperative project is established by TalTech, City of Tallinn and several private sector partners. The aim of the project is to suggest data-based solutions to analyze and guide built environment, mobility and service development related to various aspects of the 'smart' future city. Under the topic Urban spatial data analytics in urban design and planning the PhD candidate will study anticipated changes in urban spatio-functional system and its implications in urban morphology, energy economics and urban planning using computational tools.*

Research field:	Building and civil engineering and architecture
Supervisor:	Jenni Vilhelmiina Partanen
Availability:	This position is available.
Offered by:	School of Engineering Department of Civil Engineering and Architecture
Application deadline:	Applications are accepted between June 01, 2020 00:00 and July 03, 2020 23:59 (Europe/Zurich)

## Description

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Cities are in a flux: Urban complex spatio-functional system, mobility and urban economics are evolving drastically due to rapid progress and innovations in energy, ICT and other fields of technology, along with life-style changes resulting from these. While the role of corporeal urban environment will retain, it will transform. Urban transformation is intertwined with emerging phenomena such as virtuality and autonomous transport guided by AI and enabled by extremely fast telecommunication connections. However, technology is not only a driver of change, but it also provides tools and methods for better understanding and guiding it. Approaches from data analytics to simulation and machine learning are required to respond to emerging challenges in urbanity, reflected against credible future visions. For uncertainty of the future, making the city becomes crucial, along with new tools and methods of urban planning and design. Research in this position will focus on dynamic morphological and spatio-functional aspects of cities, their transformation and planning and design of cities. While our ways to use the city will evolve, urban activity landscape and morphology will respond to this change. The research problems will circle around both making and reading the city, and may delve into the following issues and beyond: the relationship between the urban morphology (density, form) to energy consumption and distributed production in different urban scales; the impact of New Work, New Mobility and resulting lifestyles to the metabolia and spatio-functional configurations of the future city; Urban planning and management methods for technology mediated 'programmable city'; or becoming of the (virtual) 'post-Pandemic city'.

### Responsibilities and tasks

Based on relevant literature, the PhD candidate will build a systemic model of relationships between anticipated future modes of work, mobility and lifestyles, and their suggested overall impacts to energy economics of cities. The candidate will estimate the relationship between urban morphology, energy consumption and (potential for) distributed energy production in cities in selected scale(s) - building, block, neighborhood or urban - using computational, spatial analyses and/or simulation tools. In the project, the PhD candidate will be responsible for data gathering, processing, and analyzing. The candidate will produce general guidelines for urban planning to respond to anticipated transition in society and city, reflecting these to theories of cities as complex adaptive systems (CAS), urban planning and design. The candidate will publish and present the work in seminars, conferences and lectures in Academia and to the stakeholders.

### Qualifications

The applicants should fulfill the following requirements:

- University degree (M.Sc.) in urban design, urban planning, architecture or architectural engineering. Consideration will be given to applicants whose previous degrees are in related disciplines in urban studies. Furthermore, we encourage applications from candidates engaged with quantitative methods and/or Geographic Information Systems (GIS). Some programming skills (e.g. Grasshopper, GIS-environment or other) are preferred. Prior contributions or interests related to complex adaptive systems (CAS) are appreciated.
- The candidate must have ability to carry out independent research and work as a part of the team, and have interest in the presentation and publication of scientific results.
- The Academy is international in focus, and good oral and written skills in English are required.

The post is a fully funded position for 4 years. The candidate is expected to work full time as a part of a research team located at the Academy of Architecture and Urban Studies building in Tõnismägi, Tallinn city center. The candidate is obligated to participate and fulfil the requirements of Tallinn University of Technology PhD program. Additional funds will be provided for conferences and other research expenses.

A of A strives to be an inclusive workplace offering equal opportunities, attracting qualified candidates contributing to the Unit's excellence and diversity. We welcome applications from all sections of the community and from people of all backgrounds.



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