

Research Themes and Summaries of Dissertations for Academic Year 2022/23
STUDY PROGRAMME SMART CITIES

Research Themes	Department	Form	Supervisor	Summary
Virtual Reality as testbed for scenarios of Smart Cities	15116	P	Prof.dr.ir. Henri Achten	<p>Many aspects of Smart Cities development deal with transformation of the transportation modes in the city, and offering an enriched information stream for the inhabitant/visitor of the city concerning those aspects. Although part of those aspects can be modeled and simulated with models, those models do not give an insight in the experience aspects of people who would be using such information streams. Creating physical mockups is expensive and subject to various methodological limitations that make it difficult to predict, which future strategy yields the best benefits. On the other hand, Virtual Reality allows relatively cheap modeling of multiple future scenarios, that due to their realism and closeness of daily experience, can offer insights impossible to gain with numerical models and simulation.</p> <p>The purpose of this PhD research is to set up the pipeline for VR-based assessment projects that can act as a Testbed for possible future scenarios of Smart Cities.</p> <p>It should be noted that the research, intermediate results, publications, and final thesis are to be in English language.</p>
Walkable Smart City: habitability, permeability and legibility of public space	1519	K	doc. Ing. arch. Irena Fialová, supervisor specialist doc. Ing. Josef Kocourek, Ph.D.	<p>Pedestrian-walking transport has been neglected as a mode of transport since we started adapting cities to mass motorisation. In the era of the 20th century car-oriented planning pedestrian networks and pedestrian accessibility were considered non-important. Congestion, pollution, urban fragmentation, obesity, safety and health risks are but few of the consequences of this approach. It is expected that the current counter trends of the 21st century - active transportation, micro-mobility and multi-modal diversification of transportation use - will continue to grow even in the era of future smart city technological changes and automated and connected vehicles. The research will focus on mapping current and proposed projects and incentives of pedestrian-walking transport infrastructure both from a transportation and urban quality point of view. Research may focus on e.g. pedestrian-friendly environment, car-free zones, reduced road danger, pedestrian networks, walking routes, hiking trails, pedestrian -crossings, -bridges, -tunnels, -escalators, -walkways, -sidewalks, -stairways, -skywalks, -facilities, underground cities.</p>
Transferia (multifunctional transport hubs) and their impact on urban structures	15119	P/K	doc. Ing.arch. Akad.arch. Ir. Jiří Klokočka	<p>Subject of scientific research activities: research of the relationship and system rules between the planning and implementation of multifunctional transport hubs (transfers) and their impact on their immediate surroundings and changes in the organization of the city. research questions</p> <p>a. Which transition processes are initiated by the integration of transfers (multimodal transport hubs) and the transformation of station surroundings in urban structures (functional and spatial)?</p> <p>b. What forces are generated by the implementation of these large-scale urban interventions? How do they work?</p> <p>c. What is the influence of these mentioned dynamics on the urban tissue of the city, both functionally and spatially and socially and socially?</p> <p>d. What is the relationship between the fanomene of transfers and the metropolitan character of the city?</p>
Sustainable urban mobility and accessibility.	15121	P	doc. Ing. arch. Jakub Vorel, Ph.D.	<p>Subject of scientific research: exploring the relationship between transport mobility and land-use in urban regions; exploring the effectiveness of administrative-regulatory and economic instruments for achieving sustainable mobility and accessibility in urban regions.</p> <p>Methodological approaches: discrete choice models, simulation modeling (i.e. např. MATSim, SUMO, UrbanSim, GAMA, MANSON, AnyLogic), machine learning methods, use of GIS and Python, JAVA. Remarks: possibility to participate in research projects, in particular with FD and CIIRC, publication of results and dissertation in English, the applicant should contact the supervisor at least one week before the deadline for submission of applications and agree on details.</p>