

Themes and Abstracts of Dissertations for Academic Year 2018-19

PROGRAMME ARCHITECTURE AND URBANISM:

STUDY FIELDS: ATT / Architecture – Theory and Design, AST / Architecture, Building and Technology, DAPP / History of Architecture and Monument Conservation, UUP / Urban Design and Spatial Planning

PROGRAMME DESIGN:

STUDY FIELD: PD / Industrial Design



Research Theme	Department	Form	Tutor(s)	Study Field	Study Field	Study Field	Summary	Connection to ongoing grant / GAČR, TAČR, NAKI, etc.
1 Interactive Architecture	15116	full-time	doc. Dr. ir. Henri Achten, PhD.	ATT			The dynamic character of buildings currently is mostly dictated by advances in interior climate control: shading, lighting, HVAC, security, and so on. For the rest, buildings remain more or less passive containers of space that do not respond to the user's needs. Because buildings have limited means to adjust their performance to user requirements, there is a rather large risk of misfit between what buildings do and what is actually necessary. This can lead to inefficient energy-use, waste of facilities, and even unsafe situations. The notion of interactive architecture offers a future vision which may counter a number of these issues. Interactive architecture occurs when the building system is able to engage in a dialogue with the user. Through this dialogue the user can make his/her needs known, and the system can dynamically adapt to support these needs. When the interactive system also has an internal representation of the user, it can even anticipate requires changes before they are made known by the user. There is no complete theoretical framework yet what interactive architecture may be, nor are there guidelines for the design of interactive architecture. In this PhD project a theoretical framework will be established, which will be tested through several concrete case studies in a prototyping environment.	Grant application in CELSA was submitted last year (Human-Computer Interaction on Architectural Scale CELSA/17/018), but not obtained. This year we make a new submission.
2 Collaborative Sketching	15116	full-time	doc. Dr. ir. Henri Achten, PhD.	ATT			In a previous PhD research, Katerina Novakova has developed CollabSketch, a web-application sketching tool for multiple people which runs on various platforms. CollabSketch allows people to create, share, and work together on sketches even though these people are not in the same place. The CollabSketch application offers a stable platform to further research sketching behaviour of architects, in particular in the context of dislocated design teams. The goal of this research is to investigate the role of sketching in dislocated design teams. A series of experiments will be designed in both laboratory setting and in practice of dispersed design teams working on architectural projects and who will use CollabSketch – including a control group of design teams that will not use CollabSketch. The communications of the design teams will be recorded and analysed. On the basis of the findings a number of more refined and focused experiments can be established and performed. The results of the research will provide important knowledge about	There is no grant. In the project we will apply for SGS and target continuation of collaboration with ETH Zurich (in which CollabSketch was developed).
3 Large traffic structures in cities and habitability, permeability and legibility of public space	15119	full-time	doc. Ing. arch. Irena Fialová			UUP	Automotive transport is and has been a major factor influencing urban planning for more than 100 years. Significantly and insensitively, it changed the structure of our cities and disturbed the habitability, permeability and legibility of the public space. The research aims at mapping, naming and understanding the impact of transport planning on the quality of public space in the vicinity of major transport structures inside the city (underpasses, overpasses, estacades, tunnel entrances, noise walls, hygienic strips of greenery etc.) and at comparing foreign examples of best practice solutions with Czech solutions, experience and possibilities with the aim of helping the modernist 20th century cityturn into a sustainable 21st century city.	1. Project SKHP 201211223/MHMP05SMPPIF is finished and currently under consideration 2. Ongoing cooperation with the CTU Faculty of Transportation Sciences and Prague Institute of Planning and Development
4 Influence of social media on the public space in cities. How to make public spaces for digitally anesthetized generation?	15120	full-time/combined	Ing. Vladimír Sitta			UUP		
5 Public space and socially disadvantaged areas	15120	full-time/combined	Ing. Vladimír Sitta			UUP		
6 Future of periurban landscapes. "Diluted" urbanism. The end of exploitative industrial agriculture?	15120	full-time/combined	Ing. Vladimír Sitta			UUP		
7 Sustainable city of short distances	15121	full-time/combined	prof. Ing. arch. K. Maier, CSc.			UUP	Dostupnost veřejných infrastruktur. Poměškování urbáních satelitů. Sídliště jako forma udržitelného kompaktního města.	TAČR Beta TB050MMR001
8 Application of computer simulations and "big data" for experimental research of the urban environment.	15121	full-time/combined	doc. Ing. arch. J. Vorel, Ph.D.			UUP	New computer technology and digital data offer tremendous opportunities for experimental research of cities, particularly in areas where such research cannot be done in a real environment. The proposed topic focuses on the use of these new opportunities for the theoretical research and practice of spatial planning.	UrbanSim
9 Application of the theory of complex systems on the study of the urban systems.	15121	full-time/combined	doc. Ing. arch. J. Vorel, Ph.D.			UUP	The theory of complex systems conceives the urban system as an ecosystem evolving to some extent spontaneously "bottom-up" by everyday activities of individual actors who are acting within the given physical, economic and institutional constraints. The operationalization of the theory of complex systems via a cellular automata models and agent-based models allows to study the motives and decision-making of actors in their local contexts and the resulting aggregated effects on the level of urban systems and by that to better comprehend the dynamic relations between micro and macro-level.	UrbanSim
10 Small towns and their associated landscape	15121	full-time/combined	Dipl. Arch. Henry Hanson			UUP	Throughout rural regions the relationship many small towns have with their associated landscape has fundamentally changed from a unified, largely self-sustaining system to agricultural land directly tied to the global food and energy system and a town that is functionally severed from its surroundings. This topic will concentrate on the consequences of this division and opportunities for a sustainable future.	Erasmus +
11 Water as an urban life support system	15121	full-time/combined	Dipl. Arch. Henry Hanson			UUP	Cities have developed with a strong relationship with and dependence on water; typically for transportation, for drinking, and for waste removal. Urbanization has had significant consequential effects on the hydrologic system with largely unintended consequences and significant infrastructure demands. Generally, the developed infrastructure is based on a quantity focused linear view of water. This topic explores opportunities of water from an integrated systems perspective where healthy water, supporting the urban ecosystem can critically enhance the resilience of the city.	Erasmus +
12 Geometry of load-bearing structures of historic bridges	15122	full-time/combined	doc. Ing. Martin Pospíšil, Ph.D.		AST		Forms of load-bearing structures of historical bridges as essential elements of their load-bearing capacity and stiffness. Historical approaches to solving statics of bridges, with respect to the form of the structure.	grant NAKI DG18P020V033