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Summary of approved PhD theses

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PLANNED RIVER: THE RELATIONSHIP BETWEEN THE DANUBE AND BRATISLAVA IN THE CONTEXT OF URBAN PLANNING FROM THE 18TH CENTURY TO THE PRESENT

Ing. arch. Monika Bočková, PhD.

The thesis deals with the mutual relationship between the Danube River and the city of Bratislava in the planning process with regard to the key moments of transformation from the eighteenth century to the present. Although we understand the presence of the river in Bratislava as part of the landscape elements of the city, in fact today's shape of the Danube is mainly a product of intentional human activity. Throughout history, the Danube has been purposefully shaped, narrowed or widened, straightened, channelized, and dammed for several reasons. The subject of the dissertation research are those historical interventions in the river that have directly or indirectly influenced the structure of the Bratislava city: not only in terms of actual realisations but also visions, which were not implemented albeit there was the ambition of such modifying impact. Following the model of contemporary reference research, the evolution of the fluvial form was analysed from the point of view of its influence on the urban form, and on the contrary, the processes of urban planning and building were examined in relation to the river. This approach allowed both to bridge existing knowledge from natural sciences and humanities as well as to bring new findings. In order to observe the river as a natural and at the same time a man-made phenomenon, a hybrid research method was applied. Selected aspects of historiographic research were combined with their visual interpretation. Comparing, redrawing, and layering of maps from different periods made it possible to track specific interventions and their impact on the river form as well as on the urban landscape. Researching the transformations of the Danube from the perspective of urbanism brought a new river-centric narrative of urban history.

PhD thesis approved at the Faculty of Architecture and Design STU in Bratislava, Slovakia, in the study programme Architecture

MULTISENSITIVITY IN ARCHITECTURE: COGNITIVE PROCESSES IN THE MOTION OF A HUMAN BEING IN UNKNOWN ARCHITECTURAL SURROUNDINGS

Ing. arch. Michal Kacej, PhD.

The dissertation focuses on cognitive accessibility and the wayfinding in unfamiliar architectural environment. It further specifies the role of semiotics and composition in intuitive and multisensory perception of physical spaces. A typology of circulation systems in buildings is developed in the context of the vector-envelope dichotomy. The dissertation proceeds to the research segment involving a pilot biometric observation utilising the eye tracking device (videooculograph). In terms of taxonomy, the process of unaided directed wayfinding by an individual was investigated while walking through passages connecting the new and the old building of the Faculty of Chemical and Food Technology, Slovak University of Technology in Bratislava. The work responds to the current significant advancements in neuroscience, showcasing

its topicality and relevance, while introducing a range of biometric tools with potential applications in neuroarchitectural research.

PhD thesis approved at the Faculty of Architecture and Design STU in Bratislava, Slovakia, in the study programme Architecture

TERRAIN VAGUE AS A POTENTIAL OF CITIES – CASE STUDY HUMENNÉ, STRÁŽSKE, VRANOV NAD TOPĽOU

Ing. arch. Romana Hajduková, PhD.

The dissertation thesis studies terrain vague in the model Slovak towns of Humenné, Strážske, and Vranov nad Topľou, which became home to three chemical factories in the 1950s. Terrain vague is studied from the perspective of key historical events, which are socialist industrialisation and transformation after 1989 (deindustrialisation, shrinking of cities) and their impact on the urban, economic and demographic development of model towns. The dissertation thesis aims to identify terrain vague, compile a typology and identify terrain vague emergence mechanisms based on the studied theoretical knowledge of the model area, its urban and historical development, and field surveys. The research yielded interesting insights into the urban development of model towns, which we related to historical and socioeconomic phenomena and thereby identified three main mechanisms of the emergence of terrain vague: political and socioeconomic changes, an unintended consequence of the master planning, and the cycle of urban development. The typology is represented by 12 types of terrain vague, with a strong presence of green spaces and elements of transport and technical infrastructure. Selected urban situations demonstrate how types of terrain vague and their emergence mechanisms are related to each other, complement each other, and form an entity. They helped us better understand the fragile bond between architecture, the town and its inhabitants, who are the driving force of life in it. Terrain vague means undesirable and abandoned areas with an absent function and negative influence on towns and their inhabitants. By implementing suitable scenarios and strategies for their revitalisation or transformation, temporary forms of use and, above all, by changing the way we look at them, we can transform these territories into living spaces that have the potential to become a catalyst for change in model towns.

PhD thesis approved at the Faculty of Architecture and Design STU in Bratislava, Slovakia, in the study programme Architecture

REGIONAL IDENTITY IN MATERIAL CULTURE AND ITS APPLICATION IN CONTEMPORARY DESIGN

Ing. arch. Marián Ontkóc, ArtD.

Identity as a sense of belonging is a fundamental internal feeling that has evolved over time and is closely linked to the attachment to community and place. This sense of identification forms an indispensable part of the social dimension of sustainability. Participation connects the relationship with a place and community and enhances the experience of identity through active engagement. Participation in rural environments is a less explored method to strengthen regional identity by involving local residents in the decision-making process. The designer, as a facilitator of the process, can utilise the creative potential towards a positive outcome. At the same time, the scope of the profession is expanding. Participation should also serve to understand the background of local problems and as a basis to define the conditions for possible competitions or public contracts. How participatory design can be used in designing built environment, objects of material culture and experiences or processes (service design) to support and strengthen regional identity, we will explore in the thesis. This approach not only ensures authenticity and relevance in the outcome but also strengthens the relationship between local residents and their region. Likewise, the author addressed the possibilities and perspectives on how this approach can contribute to sustainable development and protection of regional identity.

PhD thesis approved at the Faculty of Architecture and Design STU in Bratislava, Slovakia, in the study programme Design

DESIGN INSPIRED BY NATURE: CASE STUDY OF THE 8TH CONTINENT

Ing. arch. Lenka Petráková, PhD.

The dissertation delves into the transformative potential of integrating natural inspiration with digital technologies and AI in architectural design. This research validates that natural inspiration significantly elevates architectural design, creating structures that are aesthetically aligned with nature and embody its adaptive capabilities, resilience, and sustainable practices. The study has developed architectural solutions that harmonise with their environment by emulating studied biological entities' life cycles and adaptations. Research confirms that digital technologies are crucial for integrating natural inspiration into architecture. This integration goes beyond the surface aesthetics inspired by nature and uses digital tools to incorporate the principles and processes of biological systems into design. The first segment of research focuses on the analysis of biological systems in order to extract the principles that can be applied to architectural design. This includes detailed studies on specific organisms and ecosystems, understanding their adaptation, resilience and sustainability mechanisms. The aim of the experiments carried out at this stage is to translate these biological strategies into project tactics. Subsequent experiments are using digital technologies to create complex geometries and structures that reflect the complexity and efficiency of natural forms. The dissertation also deals with the role of artificial intelligence (AI) in improving the design process, in the context of the integration of natural inspiration. AI has proven itself as a tool in the analysis of natural patterns, forms and materials. Through a series of experiments, the work demonstrates how AI tools can be used to generate design solutions. The transition from rules-based algorithms to AI enables design informed by extensive natural data and accelerates creation inspired by nature, this means significant progress in the field of architectural design inspired by nature and lays the foundations for the new architectural paradigm N-AI-TURISM®. The dissertation describes N-AI-TURISM® as a new direction synthesising biological adaptability, digital technology, and artificial intelligence, and predicts the future impact of technological progress on design inspired by nature. Through the Case study of The 8th Continent®, the dissertation showcases practical applications of above-mentioned concepts, highlighting the potential and limitations of this innovative approach. The study represents a shift in architectural design, focusing on harmonising the built environment with natural principles and technological advancements.

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(RE)INTERPRETATION OF VERNACULAR ARCHITECTURE AND CONTEMPORARY FAMILY HOUSES

Ing. arch. Peter Kasman, PhD.

Architects who follow the traditional principles of Slovak folk architecture have been winning top prizes in architectural competitions for several years. The professional public perceives the quality of their work mainly through the received architectural awards, which also impact the wider social significance of architecture. The work examines the existence of transfer and the degree of integration of the folk architecture principles into the contemporary creation of family houses through the award-winning works of architects, holders of selected prestigious architectural prizes. The research and interpretation of the work of these architects were based on the methods of analysis of texts about their works, and also author statements (interviews), using the comparison of selected features of the examined works to (re)interpret folk architecture into the current creation of family houses in Slovakia. The applicability of the phenomenon of folk architecture (as it was called by the expert jury at the CE.ZA.AR 2020 award ceremony) in contemporary architectural creation represents a fundamental research question to which the presented work seeks an an-

swer. The work identifies, analyses and compares (re)interpreted features in the creation of contemporary family houses in the works of selected architects in Slovakia. By searching for possibilities of (re)interpreting the phenomenon of folk architecture and the premise for creating new concepts of contemporary family houses for sustainable development in architecture in Slovakia, the work follows the potential of folk architecture as an inspiration in the realised works of prominent Slovak architects from the end of the 20th century (2001) to the present (2021).

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HUMAN-CENTRED DESIGN OF COMMUNITY CENTRES

Ing. arch. Miriama Butková, PhD.

The motivation to choose this topic was the publication "Change begins together", as well as the fact that people are again starting to feel the need for community rapprochement and social networking more often. The negative impact that the oversaturation by the digitised world has on humans may be one of the main reasons for growing numbers of neighbouring communities or various civic associations. Moreover, the new coronavirus pandemic outbreak together with the restrictions of movement and gathering will surely have a significant effect on creating social ties and empowering communities in the future. The dissertation thesis elaborates on the topic of the community, taking a closer look at how architecture answers the human need to create meaningful real-life relationships (not virtual). There is an increasing demand for facilities that reflect the needs of communities. New community centres are thus becoming significant community development tools. With their programme, provided activities, ecologic and inclusive design, they embody the image of the community they serve. There is a vast potential for community architecture research. However, the community architecture theory, as well as the community centre's typology is an under-explored phenomenon in Slovakia. There is a lack of information about the whole concept of community architecture, its history, and theory. Likewise, executed projects in Slovakia are scarce to provide a sufficient research sample. Therefore, the research within the dissertation is oriented to successful European projects and presents a "community centre database" containing basic information about each project. The work examines the terminology, programme with its related spaces, functional use, degree of multifunctionality, and specific spatial characteristics of community facilities. Through detailed analysis of individual projects, common characteristics and principles are identified and compared to each other to bring an understanding of their interrelationships. The main goal of the work is to provide methodical guidelines for design practice. It also provides the basis for further interdisciplinary research through methods of participation, with urban planning, sociology, community psychology, or neuroarchitecture, to name a few.

PhD thesis approved at the Faculty of Architecture and Design STU in Bratislava, Slovakia, in the study programme Architecture