BIO +

THESIS BOOKLET

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University of Pécs
PTE MIK / Breuer Marcell Doctoral School
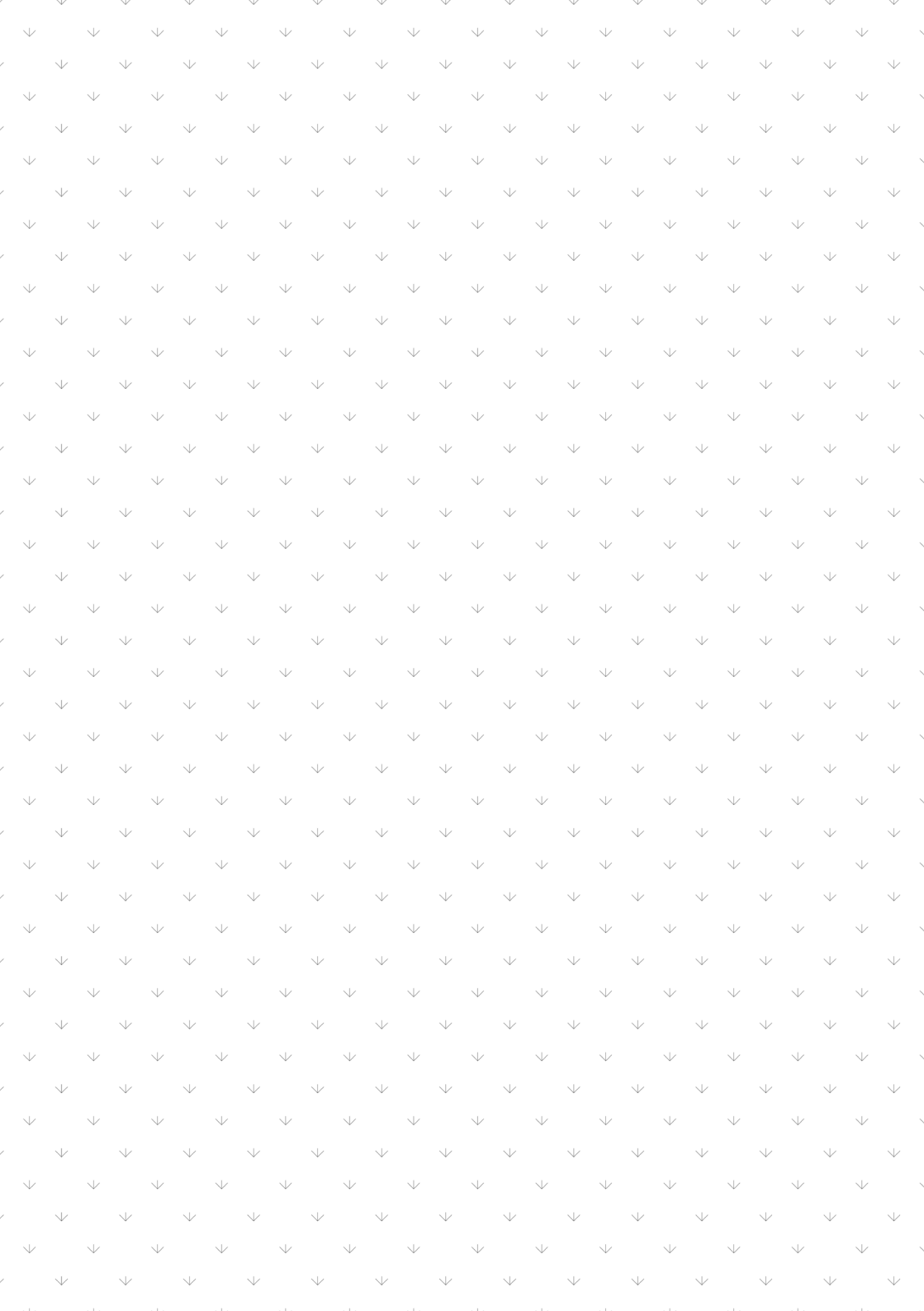Faculty of Engineering and Information Technology
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**Living in a city ---
Research on the perspective of Biophilic Design in
the design of the Healthy dwelling**

ABSTRACT

Biophilic design is an innovative way of designing the places where we live, work and study, from the perspective of the physical and psychological well-being of inhabitant, to solve the contradiction between people and urban environments in the context of the current rapid urbanization. By shaping human lifestyles and living environments, biophilic design can satisfy biophilic nature and thereby produce social psychology, economic development, environmental protection, and other positive aspects of value. It is an interdisciplinary field of study that combines biology, neuroscience, environmental psychology, and design.

The dissertation focuses on the application of biophilic design in healthy dwelling. Firstly, the concepts related to biophilic design are explained, and the relationship between biophilic design and the built environment are analyzed and established. The purpose is to provide a theoretical basis for biophilic design as a method of architectural design. Secondly, through a comparative study of the current situation of urban space in China, presents the inadequate points of human living environment in the high-density urban environment, and contextual issues surrounding the changing concept of collective living, approaches to environmental stewardship, related national policies, and the emergence of different housing types in China, explore the design approach of biophilic design for future healthy dwelling. Finally, from the case of biophilic design in residential architecture practice, the design procedures, application rules and principles are discussed. The value and significance of biophilic design for the future of healthy dwelling design is further demonstrated through the use of the city in a "green" way and the renewal of its functions.

This research breaks down disciplinary boundaries to explore systematic and comprehensive architectural theories and design methodologies. Residential architecture is used as a biophilic design carrier to realize the design expression of future healthy dwelling through the analysis of intervention lifestyles. In the research program the focus would be on architectural level, but wider surrounding context - adjoining public spaces and public facilities - would be analyzed either.

RESEARCH BACKGROUND

As urbanization accelerates, more and more high-density buildings flood into cities, natural habitats give way to urban construction, and people live in no-temperature steel and concrete cages, leading to alienation from the relationship between humans and nature. Excessive building density, and thus excessive population density, often leads to a lack of necessary functions and facilities, resulting in reduced residential comfort and environmental quality. In the context of continuous population growth and accelerated urbanization, the spiritual problems and energy crises caused by human activities and urban development have become a hot spot for research between the relationship between people and the environment.

Parks and green spaces are important public spaces in most cities, which offer solutions to effects of rapid, unsustainable urbanization on health and well-being. Integrating health as an important factor affecting the future development of cities can help find solutions that promote health, mitigate climate change and improve the quality of life of residents.

No-temperature steel and concrete cages
Left Fig: Concrete Forest
Sources: Global Network
Right Fig: The crowded view of the Huaguoyuan Community
Sources: From website. http://www.zhangzs.com/377149.html

STATEMENT OF THE PROBLEM

  As a contemporary vision, the picture of placing greenery in the built environment is becoming increasingly clear. The combination of "green" and "architecture", and even "interior space", is the hope that architecture can also have some functions similar to those of green plants, so that architecture and environment can coexist in harmony. The formation of cities is essentially a resistance to nature, which encourages a fearful attitude of nature. People fear harsh weather, dangerous animals and the spread of germs, and thus isolate them from nature, leading to isolated urban environments. Yet disconnected from nature, humans lose their biological integrity and automatically give up their birthright, which is the cause of many health and development problems. While biophilic design is only one of many strategies to assist buildings in achieving environmental sustainability, it is a very important pillar in achieving social sustainability. "Green", "natural" and "livable" are the key words of the new times, pushing us to rethink the future healthy living environment.

Bosco Vertical / Boeri Studio
Type: Apartments / Site: Milan, Italy / Year: 2014
Sources: ArchDaily Website / Photographs: Paolo Rosselli, Laura Cionci
" The Vertical Forest is an architectural concept which replaces traditional materials on urban surfaces using the changing polychromy of leaves for its walls. The Vertical Forest helps to build a microclimate and to filter fine particles contained in the urban environment."

- **THESIS 1.**

Biophilic design resolves the relationship between people and urban environments in the current setting of rapid urbanization by using nature as a foundation point to create a natural environment for multi-sensory experience directly or indirectly.

As urbanization accelerates and more and more high-density buildings flood into cities, natural habitats give way to urban construction, as a contemporary vision, the picture of placing greenery in the built environment is becoming increasingly clear. The combination of "green" and "architecture", and even "interior space", is the hope that architecture can also have some functions similar to those of green plants, so that architecture and environment can coexist in harmony. As a result, biophilic design enhances the design strategy for architectural sustainability, resolving the contradictions of growing urbanization while providing a habitat where people and nature may coexist peacefully.

ENVELOPE HOUSES
Architects: Asolidplan / Area: 620 m^2
Site: Singapore / Year: 2020 / Photographs: KHOO Guo Jie
"Going against developmental pressure, we convinced the client not to maximise the built floor area but to focus on the quality of the space instead. "

- **THESIS 2.**

Biophilic design should not only be a technical tool, but also a method to be used to build the built environment more effectively. Biophilic design aims to produce a space that can participate in improving human life by providing an opportunity for humans to live in a natural environment.

People have been gradually becoming aware of the physical energy crisis and mental problem brought on by their own activities and the 20th century. Several disciplines have, coincidentally, turned to nature as they study the relationship between humans and the environnment. Restablishing the link with nature in daily life and making up for the missing evolutionary features in cities are excellent ways to address the aforementioned issues in the design planning of futre residential areas, even for cities. The city should be a unity that is organically integrated with nature rather than a barrier that isolates nature because humans need daily contact with it [68].
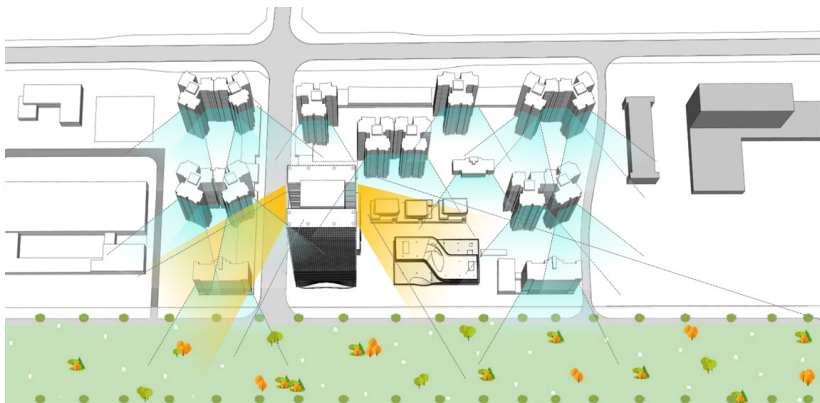

Master work 1: Yuncui Community Design
Fig: Visual relationship between living units and park

▪ THESIS 3.

The integration of biophilia theory and residential architectural design focuses on the demands of the residents and associated influences on the living environment, rather than just the outward environment of the structure.

The three basic components of biophilic design are 'Direct-Nature', 'Indirect-Nature', and 'Human-Nature Interaction Relationship'. Residential landscape, residential spatial components, residential spatial structure, residential interior design, and residential spatial environment are the five facets through which it is practiced.
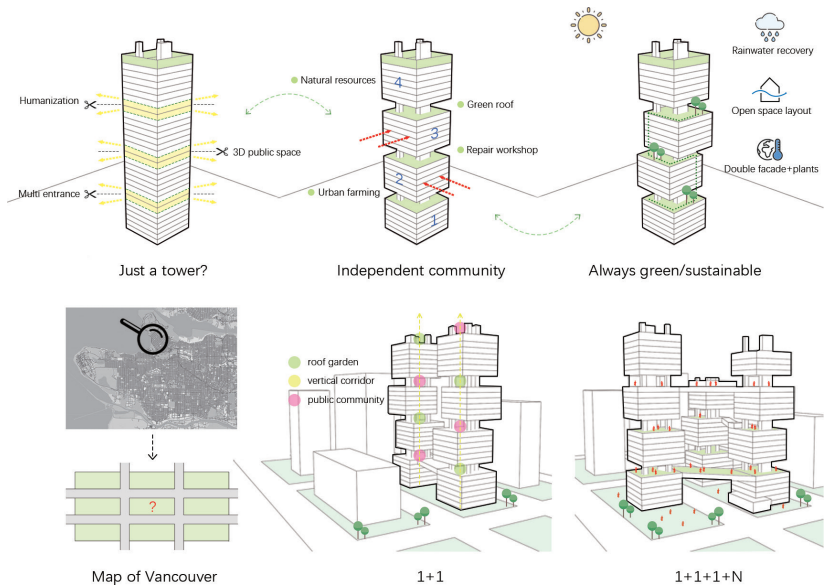
Master work 2: BIO + Health Dwelling
Fig: The conceptual of the green towers.

- **THESIS 4.**

   Biophilic urbanism has emerged as a way to bring nature more purposefully into cities, not just between buildings and infrastructure, but into and onto them in ways that increase the connectivity between people and nature and derive benefits from natura services and functions.

   This project (BIO+Urban Renewal) shows how biophilic streets can be the front door to biophilic urbanism by integrating nature into a new street design, benefiting a range of economic, environmental and social functions.

Master work 3: BIO + Urban Renewal
Fig: The renewal view of the sideslop to the street.

- **THESIS 5.**

   Biophilic design seeks to satisfy these inherent adaptations to nature in the modern built environment and, in doing so, enhance people's physical and mental health and fitness. Biophilic design should instead promote ecologically interrelated design solutions at multiple scales from distinct interior spaces, the building as a whole, the surrounding landscape, to the urban and bio-regional scale.

   This project (BIO+Meditation Cabins) depend on recognizing how much nature remains the basis for ha healthy, productive and meaningful human exitence.

Master work 4: BIO + Intervention Design
Fig: The conceptual of the meditation cabin from Kongming Latern.
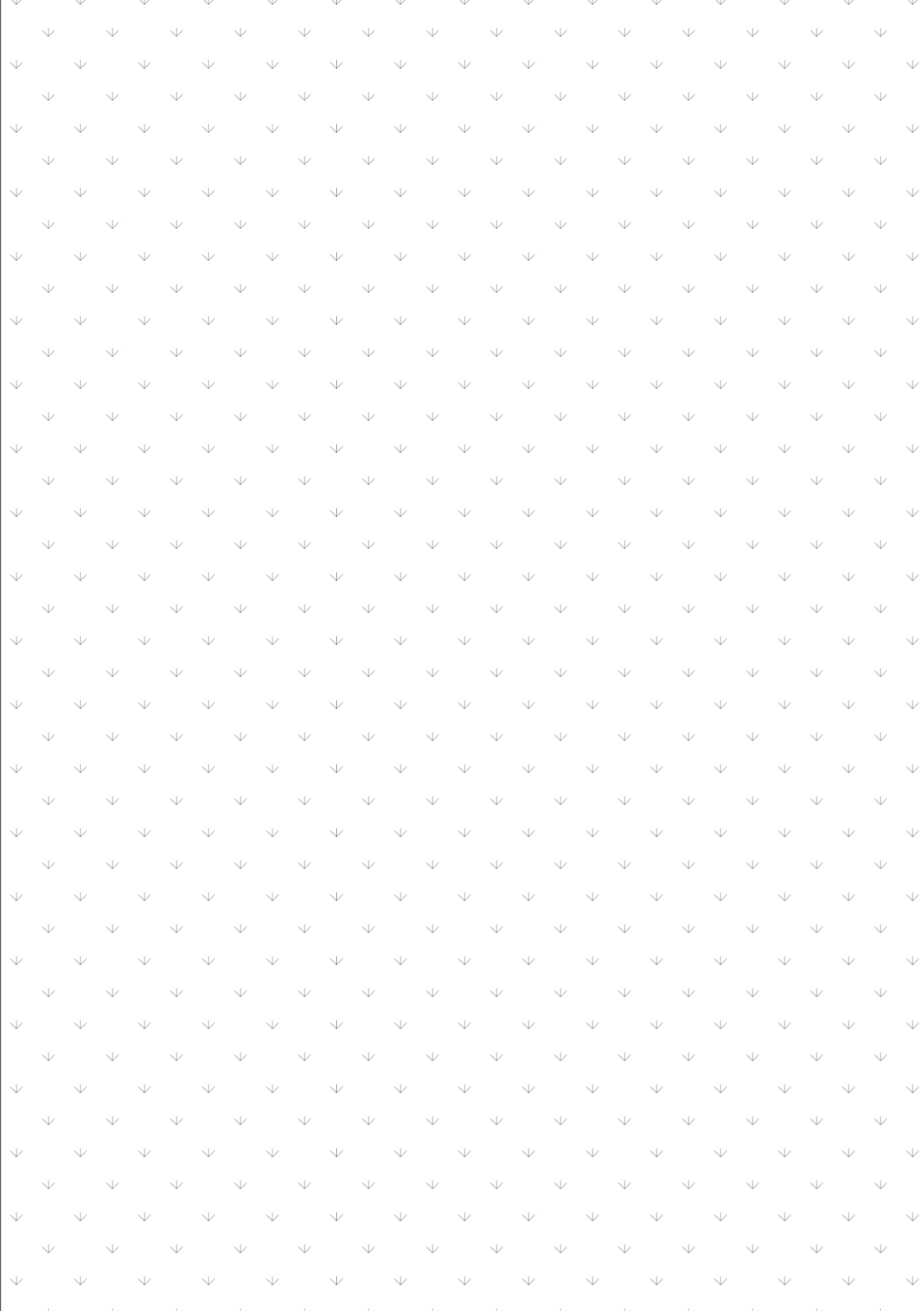
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