


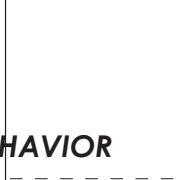
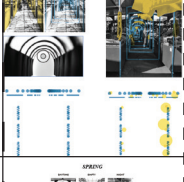
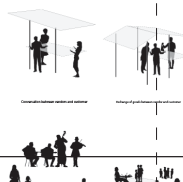
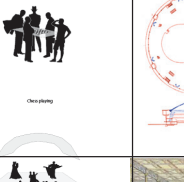
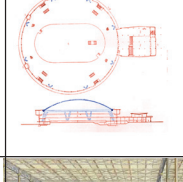
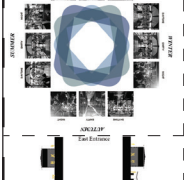
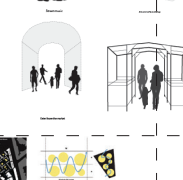
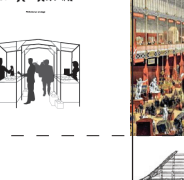
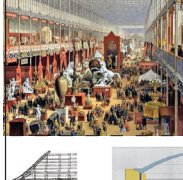

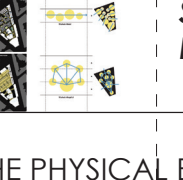
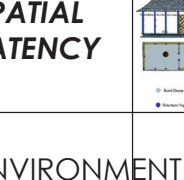
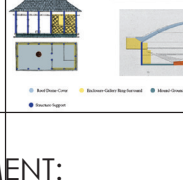


Research plan

*Urban Collage Poem—Renovation project of
Belgrade Sugar Factory*

*Mohan Yuan
5008379*

	KALENIĆ MARKET			BELGRADE FAIR		
CONTEXT STUDY						
OBJECT		STALL ENTRANCE CORRIDOR SEQUENCE	SPACE BEHAVIOR			
TOPIC/CONCEPT						
						
						
THEORY	PEOPLE IN THE PHYSICAL ENVIRONMENT: THE URBAN ECOLOGY OF STREETS STANFORD ANDERSON					
	RHYTHMANALYSIS HENRI LEFEBVRE					
EPISTEME	PHENOMENOLOGY			MATERIAL CULTURE		
	PRAXEOLOGY			TYPOLOGY		

- 1 What elements can help users recognize the space and take advantage of
- 2 How to identify the potential of the space.

Introduction

Simmons, G. (1981). People in the Physical Environment: The Urban Ecology of Streets. Winterthur Portfolio, 16(4), 354–356. <https://doi.org/10.1086/496056>

Space is one of the most important elements of architecture. The interaction between users and space attracts me. The behaviors influenced by the physical environment describe the space from other perspective which involves the users and their sensory of space. As Stanford Anderson mentioned in his article ***People in the Physical Environment: The Urban Ecology of Streets***, it is important to consider that the use of space not simply follows the intention of the designer but also affected by the perception and understanding of the user. In this way, studying how users react to the built environment can help to understand the essential elements of the space and improve design language to make a clearer expression. The better we understand the target group's need and behavior intention the better strategy we can provide that meets the needs and use with biggest potential.

The recognition of the space, however, does not remain constant over time. The demands of space are adapting to the development of society. In general, the process of industrial revolution accelerated the rate of urban development and expansion. During this period, the central areas of cities also expanded rapidly, and industrial or military facilities that used to be located on the urban periphery or in the countryside were gradually embedded in the newly expanded urban areas. Large population flushed into the city to seek for better working positions in the factories and cause the short of the residential space and the rapid increase of the urban area land values. Driven by land prices, various planning policies and environmental protection purposes, a large number of factories and military bases have been relocated from urban centers to suburban areas or nearby satellite cities after dramatic urban expansion. For various reasons, a large number of buildings and facilities have not been utilized and have gradually become urban brown fields, abandoned sites or even ruins over time. These spaces have become deserted islands in the urban center. Spatially, they are cut off from the urban environment and lack connectivity and continuity. Functionally, they become a wasteland, city texture stops at those points. Although the abandoned buildings and sites can still, to some extent, hint at the vague appearance of the city in the past and some examples of the style and form of specific types of buildings from the industrial era, these spaces present a very negative and resistant attitude due to the lack of improvement and utilization adapted to the current urban needs.

In Belgrade urban area, there are a lot of abandoned plots that are isolated from their context and fragment the urban texture. Those abandoned areas mostly separated by the rapid development of highways and lack of proper management after the industry factory moved out from the central area which leaves the space to become the lost space and empty function area in the city. Under this condition, urban renewal and building renovation are effective methods to maintain the balance between protecting the urban context and adapting to new needs. Recognizing the spatial potential of those abandoned areas and generate new suitable use and form helps gather the fragments into one whole piece again. Thus, the research will be divided into several stages by answering the following questions:

- 1) What elements can help users recognize the space and take advantage of it.
- 2) How to identify the potential of the space.
- 3) How to implement the potential and transform the space to meet the present requirements.

Previous Research and Precedent Study

The previous group research mainly focused on phenomenology and praxeology while the precedent study extends to the material culture. Phenomenology is the subject of the perception of space and embodied experience. The praxeology pays attention to social-spatial practice and user perception. On the other hand, material culture provides a solid technical support background for the formation of architectural details and space.

As for the group research of Kalenic Market, by studying the concept of the latent environment from Anderson's article ***People in the Physical Environment: The Urban Ecology of Streets*** we structure the group research framework into three phases of the physical environment, effective environment, and latent environment. Following the structure, we managed to get an approach to answer the first two questions mentioned before. Specifically, we use google street Maps, site photos, human behavior from video, news reports, and online reviews from several websites to understand and research the Kalenic Market. After having an overall understanding of the site, we mainly use the analytical diagram, theory reference, and what if study to help future study. From this research, we try to conclude the crucial criteria that would help identify spatial latency as for the Kalenic Market they are the dimensions, configuration, and the changeability in its inner structure.

Simmons, G. (1981). *People in the Physical Environment: The Urban Ecology of Streets*. *Winterthur Portfolio*, 16(4), 354–356. <https://doi.org/10.1086/496056>

To be specific, in the first stage, by selecting important facilities which help users to identify the space as the function of trading such as : the market stall, entrance and market corridors we start to understand how the market space and the exchange behavior connect with each other. We use google map, news interview video and site photos to get information about the scale of mentioned facilities and behavior happened in the market. In this process we noticed that many behavior other than trading happens in the space which leads us to dig deeper into the reason and relationship of unexpected action taking in place. By looking in to the ***Rhythmanalysis*** of Henri Lefebvre and ***Genius Loci: Towards a Phenomenology of Architecture*** by Christian Norberg-Schulz we analysis the facilities and arrangement in the space to have a clearer vision of reason which leads people to have other behaviors such as chatting, musical performance, chess playing in a space designed specific for exchanging goods. The different combination of facilities in the markets brings a spatial sequence to the market and with slight difference in the sequence introduce the difference to the rhythm and encourage people to linger around and take more actions. By focusing on the phenomenology theories we can classify the experience of space and connect the behavior together with space. Finally we start the what-if study to replace the market function in the space in order to test the criteria that gives the space potential of latency. From different scale level we hypothesis the possible interaction between users and the space. During the process we realize that the function is not the crucial factor affect how people use the space but the dimensions and flexibility gives the space potential to allow new behavior take place and bring new function into the space.

Henri Lefebvre, & Lefebvre, H. (2004). *Rhythmanalysis*. Bloomsbury Academic.

Norberg-Schulz, C. (1979b). *Genius Loci: Towards a Phenomenology of Architecture*. Rizzoli.

Regarding the precedent study besides the previously mentioned methods, we also use historical maps, 3D modeling, technical drawings, and similar function architecture case study to understand how the structure and form of the Belgrade Fair Hall 1 gives its space elegant quality and potential to fulfill different use over time. Besides aiming to answer the research questions related to the interactions between the users and space, we also try to understand how architecture makes communication through form and function. Similar to the group research, the main focus is on the relation between behavior and space. The form of space gives users indication to take advantage of space and fulfill the expect function.

Position of Theories

In the course of my previous research, I realized that user behavior and the characteristics of the space itself are inextricably linked. By identifying the scale of space, the combination of forms and boundaries, the user identifies and gives certain behavioral feedback to the space, which in turn leads to the formation of functions. This also confirms Stanford Anderson's idea that the function of architecture does not depend entirely on the designer, but more on how the people who use the space identify and use it. The deviation between the designer's preconception of the space and the user's potential perception of the space generates spatial latency, so it is necessary to analyze the user's experience and perception in the space, and this analysis can help architects understand how different spatial elements lead to different behaviors.

Norberg-Schulz, C. (1979b). *Genius Loci: Towards a Phenomenology of Architecture*. Rizzoli.

First of all, in the study of Kalenic Market, I found that spatial form has a significant influence on people's behavior; open or cramped, linear or nodal space, open or enclosed space will give users appropriate guidance and hints, and also bring different degrees of spatial potential, which will lead to more kinds of activities. In ***Genius Loci: Towards a Phenomenology of Architecture***, the author summarizes several different forms of landscapes and abstracts them into a symbolic combination of elements. In the process of summarization, the difference in the types of landscapes not only lies in the different or diverse combinations of spatial elements, but also in the spatial perceptions brought by the different categories of landscapes. This difference in perception gives the site a unique style, which in turn gives the place a personality and memorable characteristics. Although his summary of the patterns of the landscape is large in scope and scale compared to the individual cases of the buildings studied by the previous group, this abstraction into symbolic generalization can be continued. At the human scale, the horizontal and vertical elements that outline the boundaries of the space, and the persistent or temporary nature of the elements themselves, guide or limit people's behavior in the space. At the same time, research and study on a larger scale helps designers to understand the perceived characteristics of the place environment, which can be more harmoniously integrated with the urban context and even serve to reinforce the characteristics of the environment. In this way, the urban environment becomes more local and recognizable, avoiding the mechanical production of urban sprawl and the loss of cultural heritage. Combined with the composition of rhythm mentioned in Henri Lefebvre's ***Rhythmanalysis***: repetition and change, the rhythm is formed by the spatial sequence composed of multiple spatial elements. In spatial sequences, elements are connected and can be compared with each other, and people's perception of space becomes more diverse. The combination of spatial sequences or rhythmic variations brings more possibilities for users to perceive space and thus achieve a variety of uses of space.

Henri Lefebvre, & Lefebvre, H. (2004). *Rhythmanalysis*. Bloomsbury Academic.

Specifically, in urban renewal and building renovation, identifying the value of the existing environment and utilizing it is an important step. In the face of rapid urbanization, it is important and necessary to preserve local culture and spatial characteristics and to continue the cultural lineage. This is a necessary means to protect the value of the city and to prevent places with historical and cultural characteristics from being reduced to a uniform and patterned modern city without individual characteristics. At the same time, the protection of local characteristics is also a kind of attention and consideration for urban residents, and the vitality of the city comes from the active participation of users in urban life and the implicit mutual adaptation. Therefore, the subsequent personal design will continue to start from the user's perception and spatial experience, trying to reactivate the lost spaces in the city and return to the environment as an active part of the city.

Design Project

As for the individual project, I choose the old Sugar Factory in Čukarica as the site. The Sugar Factory was built in 1901, it was the first sugar factory in Serbia back to that time. In the 1980s, it was listed as an important work of industrial architecture and was included in the Topčider Spatial Cultural-Historical Unit of Exceptional Importance. This site is between the Sava riverside and the famous local racecourse Hippodrome but they are isolated by the city highway and tram track. On the east side of the plot there is an old oil refinery site left with train tracks extend into the sugar factory which considered to be used as transport track for materials and fuels back in time. As described in the article from *the Calvert Journal*:
 The building, once Yugoslavia's largest sugar refinery, stands proudly even as parts of its roof succumb to gravity and its red-brick walls gently bow in sympathy. One section of the building, however, remains intact: windows glazed, roof sealed, brickwork perpendicular. In winter, a small steel chimney emits a thin trail of smoke. In fact, this 50-metre stretch of The Sugar Factory houses a 450-seat avant-garde theatre, as well as a ballet hall, restaurant, bar, greenhouse, and a giant birdcage full of brightly-coloured parakeets. Its palatial spaces and cosy corners blend elements of an ancient temple with a Bond villain's lair: faux-Roman columns stand by glittering Egyptian arches; murals depict characters from Eastern mythology meeting those from European classics; a grand piano rests on a marble floor under a ceiling of shimmering LED stars, next to a wall of tube televisions." As for the history and culture values besides the factory itself, in the site where in the center part near to the Sava riverside there is a remain Bust of Dimitrije Tucović and a monument to the killed strikers and warriors during the National Liberation War.

Balakjian, A. (n.d.). Meet the man who built Belgrade's theatre of broken dreams, where the Yugoslav ideal lived and died. The Calvert Journal. <https://www.calvert-journal.com/features/show/11232/meet-the-man-who-built-belgrades-theatre-of-broken-dreams-where-the-yugoslav-ideal-lived-and-died>

The main building of the Sugar production and refinery is partially kept as the theater and a botanical garden. There is also a spirits refinery to the west of it, which was used for the production of some spirits due to the sugar beet process and the by-products produced by the process. In addition, the sugar factory was built with several staff dormitories, administrative office buildings, as well as warehouses and warehouses. The sugar factory buildings are now in a state of disuse, and some of them have become dangerous due to the lack of repair and maintenance, however, in the two main production buildings there are still well-preserved production equipment left.

Belgrade itself is known for its strong artistic and musical cultural atmosphere. Through researching the location of the venue and the distribution of public facilities in the surrounding area, we found that there are a large number of art and cultural facilities such as stage performances, art galleries, museums, convention centers and churches and other public facilities. Located in such an urban environment, if functionally, the sugar factory can be transformed into an art and culture related use, and as for the spatial layout can form a good landscape corridor with the Sava River and optimize the spatial connection with the race course, then the whole site can form a more closely related and popular urban art and entertainment living room. To be specific, the project is to renovate the plot into an art complex that contains the functions of the gallery, museum, theater, youth hotel, public park, and fair market.

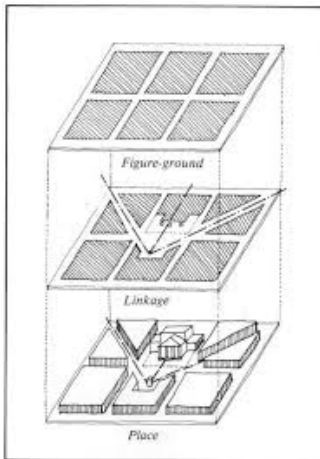
Inspired by the collage poem, I consider this project as a process of extracting and reorganizing existing elements in the site and achieve new meaning. Till now, the research study focused on phenomenology and praxeology and try to push the research further to find an answer to the third question about how to implement the potential and transform the space to meet the present requirements. In the book *Finding Lost Space--- Theories of Urban Design* by Roger Trancik, mentioned 3 theories to understand and analyze the urban con-

Trancik, R. (1986). Finding Lost Space: Theories of Urban Design (1st ed.). Wiley.

text.

The first one is the figure-ground theory which can be used to have a more intuitive impression of urban texture and space order. By applying this theory to the plot I noticed that site has a fragmented texture with its surroundings and lack of coherency in spatial order. The scale and layout of industrial buildings are more in line with the consideration of production efficiency and safety. Compared with the small-scale buildings in the surrounding urban fabric, which are arranged along the streets to form an urban space with a sense of enclosure, and the buildings are closely integrated with the urban pulse to form a directional spatial order, the buildings of the factory are arranged in a loose and disorderly manner, and the internal spatial layout of the site lacks directional guidance, and lacks correspondence and communication with the external urban environment. This is one of the reasons for the fragmentation of the factory and the urban space.

The second theory is linkage theory which usually used for analyzing the circulation, movement, and connection in certain areas. Following this theory, it can be concluded that the site and its urban environment lack proper connections and sight corridors. Although the site is next to the riverbank, the highway cut off the circulation connection between the plot and the natural resource. On the other side of the site, the factory is divided from the racecourse by a tram track, which in turn makes it difficult to create a meaningful and attractive corridor between the racecourse itself and the riverside space and the surrounding urban environment.



The last theory is the Place theory which emphasizes the importance of the cultural context and place identity. The old Sugar Factory has a history as the first and once the biggest beet sugar factory in Serbia in the early 20th century. Later on, the plot developed into a popular and well-known underground theater after the buildings were abandoned. After some development, the underground theater is not only popular for its excellent repertoire, but also for the cultural image of freedom and equality it creates, which has made the theater a legendary presence in history. This historical background of the sugar factory laid a solid foundation for its subsequent transformation into an art complex. In addition, after many wars and various informal renovations, the interior space of the main building of the sugar factory is a mixture of different elements based on the industrial architecture to form a very fantastical spatial atmosphere: the rough and dilapidated industrial architecture, the delicate and bright stage scenery of the theater, the second-hand furniture scattered in all corners to show the warmth of life and the carefully created botanical garden-like natural intimate experience. Consider the functional facilities surrounding and inside the site: famous local racecourse, popular performance stage, museums, art gallery, exhibition fair, and former theater, the function of the art complex will fit in and become a suitable connection node in the area. In turn, it responds to the city in terms of function, becomes a kind of continuation and development in terms of cultural context, and is closely integrated with the city in terms of longer-term development.

After sorting out the relationship between the site and its urban context and determining the function, the next step is to screen and classify the existing buildings in the site according to their architectural potential and their own historical and cultural value for preservation, renovation or demolition. The standard of selecting elements includes having high historical and cultural value, can provide a rich spatial experience, and have the transformation potential suitable for the target function. In addition to the building itself, the remaining production facilities in the industrial building such as sugar refining equipment, railroad tracks, cranes, well-preserved chimneys, etc. are also worthy of different renovation and reuse, so that the historical characteristics and spatial features of the industrial heritage can be preserved, but

also combined with artistic functions to become unique artistic symbols, combining old elements with new functional needs to form a new meaning.

The previous group research of the market space and the precedent study of the Belgrade Fair Hall 1 gives me the experience to identify the crucial elements and the potential of space. During this process, I used scale compare study to understand the size of Sugar Factory and relation with other famous industry renovation projects, precedents study to get ideas of renovation direction for industry building and detail building techniques, historical documents to help analysis the condition and value of the buildings in the site, google street view to get in present appearance of the plot and relation with surrounding urban context, journal articles to gather more background information about the history and culture background of the Sugar Factory and help to identify the value of different building and elements in the plot, and etc. as methods to research for the project. Those methods help me to have a more detailed and precise understanding of the building condition and interior space.

In the following design process, I will extend the research to material culture, memory studies to properly preserve the value of this industry ruins and update the buildings to meet the present function requirements at the same time. The focus of the design will be on the two main buildings of the sugar refinery: the sugar refinery building and the spirits refinery building, which will continue the function of the theater and add art exhibitions, bars and markets. The entire sugar refinery building consists of several building sections of different levels. Therefore, the design plan introduces a green corridor as the main penetration space of the building, which blurs the boundary between indoor and outdoor spaces and attracts people to enter the building, divides the different functions reasonably and creates a natural and rich spatial experience. The spirits refinery building on the west side has a relatively enclosed and private inner courtyard space, so the different functional areas of the building are allocated, and the inner courtyard is used as a central node to connect the flow of different zones. At the same time, the two buildings have an overlap in the introduction of functions in the renovation, and the two independent buildings are connected through the installation of corridors and passages. The next step is to spread the spatial axis of the building to the outside and create an echoing spatial order with the other preserved elements of the site. As a whole, two spatial axes are created that run through the site, linking the riverside space, the sugar factory and the racecourse into a highly accessible entity.

The final result of the project will be consisting of detailed renovation design of the main sugar factory building and wine refinery building, and master planning of the site with connection indication with the urban context. The site will have several spatial corridors that communicate with the riverbank and racecourse, inside the plot space will be reorganized in a more friendly and intimate scale to activate. The two selected main buildings will be redesign can hold the new functions as the main part of the whole art complex. The final purpose of this project is to bring the place back to its environment and reconnect to the urban context both spatially and functionally.

Design Strategy

I chose the industrial building renovation project as my personal graduation design. The design strategy was inspired by collage poetry. The process of creating a collage poem can be broken down into three steps: 1. extracting words, phrases or short sentences from existing textual materials; 2. reassembling and reworking the extracted elements. 3. Forming a new content out of the original context and meaning. In my opinion, architectural renovation projects follow the same steps.

First of all, as a renovation project, it is different from a brand-new design project, which requires the designer to select the elements that have the value of preservation and renewal from the existing site and buildings. By analogy, I finally selected the two main buildings of the sugar factory and the spirits factory for preservation, and extracted the well-preserved industrial equipment with space for renovation, the KPGT theater and the botanical garden that remained in the site. After extracting the valuable spatial elements of the site, appropriate operation and design methods are adopted to reassemble these architectural elements. Firstly, the main building space and the corresponding behaviors that may be generated are analyzed from the spatial scale perspective, combined with the way and experience of the preliminary group research. Then, combined with the corresponding precedent analysis, the possible spatial utilization of the program is determined. As a whole, the ultimate goal of the project is to closely connect the whole site with the current urban environment and to become an urban place with practical functions and actively used by citizens. Therefore, in addition to the spatial analysis of the interior of the preserved elements, combined with ***Finding Lost Space --- Theories of Urban Design*** on active urban space. Therefore, in addition to the spatial analysis of the retained elements, the site and the surrounding environment will be transformed and designed as necessary to achieve a good connection with the riverside space and the urban environment with minimal changes to the site. In the end, it is expected that the renovation project will form a more natural connection with the Sava River, where the industrial heritage space will be connected to the natural space in a transitional way, as a place with art and culture as its core function, echoing the existing public spaces in the surrounding area, and the abandoned industrial park will have a new function, returning to the urban fabric of Belgrade and opening up to the community as a lost urban space that is no longer resistant.

The focus and difficulty of the whole design is to identify the potential of the space and to use and combine it. Just as in the creation of the collage poem, the most valuable and testing part is how to combine and reuse the extracted words in order to achieve a new meaning. In this process, the experience of previous research provides some ways to explore the potential of space from the user's point of view, to envision as much as possible how the user will perceive the space, which spatial features can provide guidance and hints for the user's behavior, and which desired behaviors and functions need to be further processed and modified by the designer in order to strengthen people's perception of the use of space. The space is used to enhance people's perception of how to use the space. In this design process, the function of space or architecture is no longer a condition to limit or restrict the space, but a result of feedback on the perception of space, and the interaction between space and users eventually forms the function perceived by the group.

Literature and Practical Preference

Literature list:

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Stratton, M. (2000). Industrial Buildings: Conservation and Regeneration. Taylor & Francis.

Trancik, R. (1986). Finding Lost Space: Theories of Urban Design (1st ed.). Wiley.

Henri Lefebvre, & Lefebvre, H. (2004). Rhythmanalysis. Bloomsbury Academic.

Precedent list:

Kolumba Art Museum of the Cologne Archdiocese / Peter Zumthor Museum

Boiler House Libčice nad Vltavou / Atelier Hoffman

LocHal Library / CIVIC architects + Braaksma & Roos architectenbureau

798 Art District Renovation Beijing China

Self-Assessment

Throughout the research process, it was not only a reflection and refinement of theories and design solutions, but also an in-depth analysis of self-learning goals and interests. Even in the course of this semester, the question I thought about most was not a specific reflection on a theory or method, but why I chose architecture. This question was actually asked over and over again when I was first introduced to the field, but I never had the opportunity or the urgent need to give this question a deep and sincere thought. Was it simply because it seemed like a good major? It didn't seem that simple, and that didn't convince me why I chose to go to graduate school. I began to think back to what topics I had focused on most each time since my first design assignment, and I felt that although I hadn't thought about a clear answer before, my experiences and actions over the years should give me some ideas and clues. I found that the topic of people's behavioral responses to space and users' perceptions of space has always been of interest to me. The process was not easy for me, and there were moments when I wanted to give up, but I still felt a rare sense of relief and motivation when I finally faced the difficulties and achieved some results. This is not only a reflection on this graduation project, but also a preview and exploration of my self-doubt throughout my career.

In the process of research, through the study of related theories, I am constantly clarifying my understanding of the relationship between behavior and space. At the same time, this process also prompted me to think about how to obtain information and analyze it in as objective and accurate a way as possible, how to correlate the theoretical thinking summarized by previous people with real phenomena and problems, and how to apply the theory to the design process with a clear goal to discover understanding and solve problems. These are the valuable lessons I have gained through this course.