



# Space Syntax Analysis of Living Monuments: A Case Study of Dusun Krecek, Temanggung

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**Abstract.** This research about a space syntax analysis on the spatial characteristic of living monuments in Dusun Krecek, a small village in Temanggung, Central Java. The identified living monuments in Dusun Krecek are the village *pendapa*, Krecek waterfall, Vihara Dhamma Sarana, and their ancestral cemetery. These spaces act as a center of social and cultural expression. In addition, the preservation of these living monuments is proof of their respect for their tradition, elders, and ancestors. This research aims to identify the spatial pattern of Dusun Krecek and how its residents behave in the living monuments. The grounded theory method is applied in this research to explore the social, cultural, and architectural aspects of Dusun Krecek. The primary data is gathered through participant observation, which is followed by a place-centered mapping to identify the social mixing in each space. Interviews and group discussions are held with the village residents to further understand the dynamics between the actors and the space. The codes be used and followed by a space syntax analysis using the street segment map to further understand the spatial characteristic of living monuments in Dusun Krecek. The findings of this research suggest that the spatial configuration of Dusun Krecek is a direct reflection of the structuration of Dusun Krecek. This is linked to the degree of openness and the community empowerment of the people of the village. Thus, the living monuments in Dusun Krecek are a space for religion, tradition, interaction, adaptation, and livelihood.

**Keywords:** Community Empowerment, Dusun Krecek, Grounded Theory, Living Monument, Space Syntax.

## 1 Introduction

According to Giddens' structuration theory, all agents are capable of making a difference to everyday social affairs [1] [2]. Spaces within a village or a town enables and constrains actions of said agents [3]. This social structure can be based on everyday activities which creates a unique spatial pattern. This is evident in Dusun Krecek, a hamlet or village located in Temanggung Regency, Central Java [4].

Rich in history and culture, the development of Dusun Krecek encourages freedom in social expression and cultural and religious diversity. The elders of Dusun Krecek also strive for the preservation of living monuments in the village. This serves as a form of respect for their ancestors and the nature which surrounds the village [5] [6]. The living monuments in Dusun Krecek, such as the village *pendapa*, Curug Krecek, Vihara Dhamma Sarana, and the ancestral cemetery, have a close-knit relationship with the community and serve as centers of social expression and religious diversity.

The living monuments in Dusun Krecek not only signify the history of the village, but also serve as spaces for religion, tradition, interaction, adaptation, and their source of livelihood. The structure of Dusun Krecek community is a direct reflection of their open nature and the community empowerment that has existed for a long time.

This research focuses on identifying the spatial pattern of Dusun Krecek and how its residents behave in the living monuments. Its rural transformation is deeply rooted in cultural values as well as the unique landscape surrounding the village. Activities generate patterns of behavior within a space. Actors or agents act accordingly to the rules, which are formed from the repetition of these patterns. Space syntax analysis can be used to investigate how social structures, local cultures, and the behavior of actors or agents influence the spatial arrangements in Dusun Krecek.

## 2 Research Method

This qualitative research uses the grounded theory research strategy which requires participant observation during the data collection stage. Place-centered mapping is done during the data collection stage to identify the users, activities, and the social mixing within the spaces in Dusun Krecek. Observation is done on three separate occasions: *merti dusun*, *nyadran*, and on a regular weekday.

Long observations and in-depth interviews with the village locals are also done in order to find keywords and codes which will be analyzed in the coding process. During the open coding stage, codes are identified from the actor's own words. These are then categorized based on the closeness of meanings.

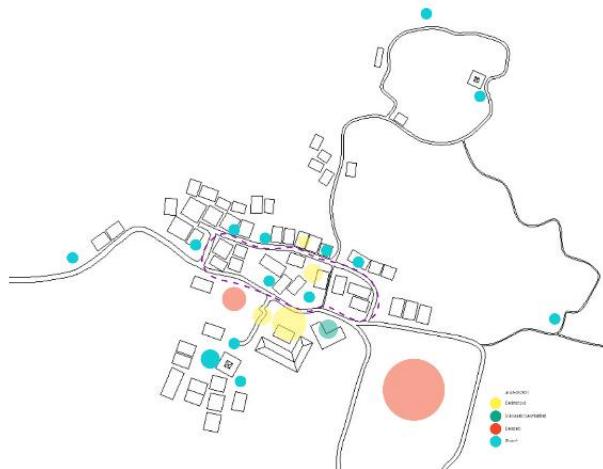
The categorized spaces are further analyzed using a space syntax analysis such as convex mapping and street segment mapping to identify the frequency of activities in the living monuments as well as the space required for said activities.

## 3 Result and Discussions

### 3.1 Place-centered Mapping

Place-centered mapping is used to see how the actors use the space and how they place themselves in those spaces [7]. Figure 1 shows how Dusun Krecek residents behave during *merti dusun*. The *merti dusun* is an annual event celebrated by the residents of Dusun Krecek which lasts for three consecutive days. The phrase "*merti dusun*" is understood as the village cleanup as an expression of gratitude for all the blessings of life. Sacred places such as the vihara or temple, meditation hut, and the water spring are

cleaned during *besreh* process. Other most frequented place is the *pendapa* where all residents and guests gather before the *arak-arakan* procession.

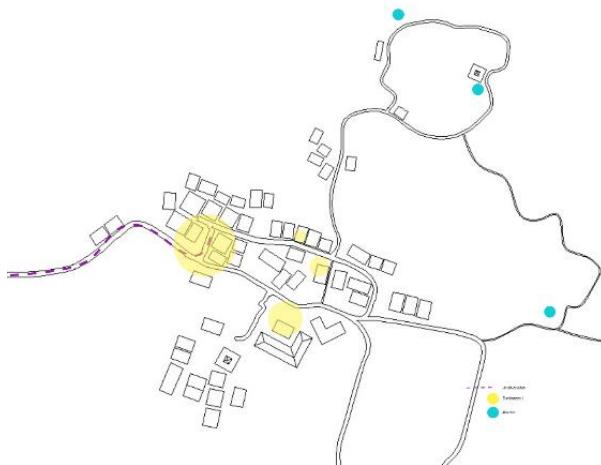


**Fig. 1.** Place-centered mapping during *merti dusun* (Author, 2024)



**Fig. 2.** Physical traces after *merti dusun* (Author, 2024)

In contrast to the activity pattern during *merti dusun* shown in Figure 1, the most frequented places during *nyadran* are the water springs and the ancestral cemetery. This is shown in Figure 3. *Nyadran* or *sadranan* derive from the old Sanskrit word “*sradha*,” which means devotion to one’s ancestor. The *nyadran* activities are a joint event carried out by the residents of Dusun Krecek and its neighboring village, Dusun Gletuk. The residents of both villages participate in *besreh*, which involves cleaning the ancestral cemetery, roads, and water sources.

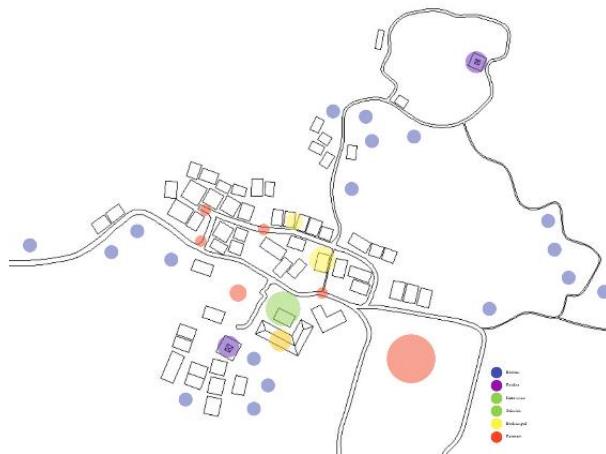


**Fig. 3.** Place-centered mapping during *nyadran* (Author, 2024)



**Fig. 4.** Physical traces after *nyadran* (Author, 2024)

Figure 5 show the activity pattern on a regular week day in Dusun Krecek. Since most of the residents of Dusun Krecek works as a coffee farmer, most days are spent in the fields surrounding the village.



**Fig. 5.** Place-centered mapping on a weekday (Author, 2024)



**Fig. 6.** Physical traces on a weekday afternoon (Author, 2024)

### 3.2 Living Monuments in Dusun Krecek

The place-centered mapping conducted in Dusun Krecek reveals the spaces that are frequently visited by the residents of Dusun Krecek in their daily lives. The mapping results show nodes which represent living monuments that have a close relationship with the community of Dusun Krecek [8].



**Fig. 7.** Curug Krecek during the dry season (Author, 2024)

Curug Krecek is one of the three water sources in Dusun Krecek. At the base of the waterfall, a sluice gate has been constructed to regulate the flow of water directed to the fields and houses. The prolonged dry season in 2023 resulted in a reduced flow of water supply from the waterfall [8]. Curug Krecek has the potential to become a tourist destination, and efforts for the rehabilitation of the waterfall have been taken by the local community to attract visitors.



**Fig. 8.** Mbah Sukoyo praying to Dewi Tara at the water spring (Author, 2023)

The other two water sources are water springs located on the north and east of the village. The residents of Dusun Krecek believe that Dewi Tara and Dewi Sri guard their water sources. Therefore, offerings made of sticky rice are made periodically as a form of gratitude, as Dusun Krecek has never experienced drought.



**Fig. 9.** *Pendapa* Dusun Krecek (Author, 2024)

The *pendapa* generally serves as a guest reception area and a meeting place for residents. The *pendapa* also functions as a space for *karawitan* (traditional Javanese music) and *kuda kepang* dance, which are unique arts of Dusun Krecek. This makes the *pendapa* a space for cultural expression and social diversity. The *pendapa* also serves as an interaction space for both residents and visitors, which reflects the openness of the Dusun Krecek community.



**Fig. 10.** Vihara Dhamma Sarana in Dusun Krecek (Author, 2024)

Vihara Dhamma Sarana is the only place of worship in Dusun Krecek. The majority of the residents in Dusun Krecek practice Buddhism, and this temple serves as a center for religious and spiritual activities for the community.



**Fig. 11.** *Nyadran* at the ancestral cemetery in Dusuk Krecek (Author, 2024)

*Nyadran* is a tradition passed down to honor the ancestors of Dusun Krecek and Dusun Gletuk, even though the residents of these two neighboring villages practice different religions. During *nyadran*, offerings are given to ancestors and residents visit the ancestral cemetery together as a sign of respect for their ancestors. This spiritual practice forms the foundation for their community's daily life and the organization of their village space.



**Fig. 12.** The Dusun Krecek Settlement is oriented towards the ancestral cemetery to the west of the village (Author, 2024)

Although the existence of Dusun Krecek dates back hundred of years, the current location of the village has only been established for about 100 years. The relocation of the

village occurred because the residents wanted to be closer to the ancestral cemetery to the west.

### 3.3 Open Coding

Open coding is done in three areas: the *pendapa*, the settlement area, and the coffee plantation area. The three things to look out for during this stage are the activities, the actors, and the space itself [8]. Through the observation of the aforementioned areas, the activities in each space could be grouped together based on the phenomena happening in each one [9].

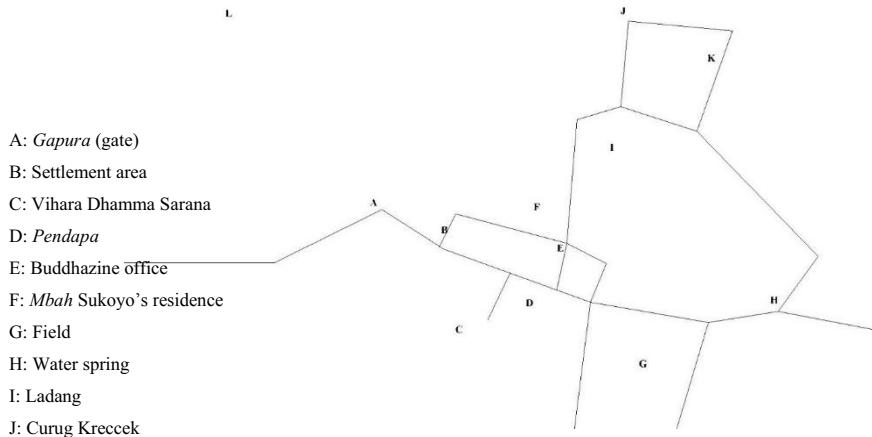
**Table 1.** Identifying the phenomena in Dusun Krecek

Areas of Observation	Activities/Function	Phenomena
<i>Pendapa</i>	Receiving area, gathering space, performing arts space ( <i>karawitan</i> ), <i>ken-durian</i>	A space for social and cultural expression
Settlement area	Place to live, <i>besreh</i> , place to rest	A way to reflect on the community's culture and honor the ancestors
Surrounding nature	Place to meditate, <i>besreh</i> , water spring for traditional rituals	Nature as a place of respect

The spatial phenomena identified during the open coding stage shown in Table 1 can be narrowed down based on the context of events. The *pendapa* area is considered to be a space for cultural expression and social diversity. The built homes are a direct reflection of the community's culture and as a way to pay respect to their ancestors. Nature is considered as spaces of reverence, as well as the source of livelihoods for the Dusun Krecek community.

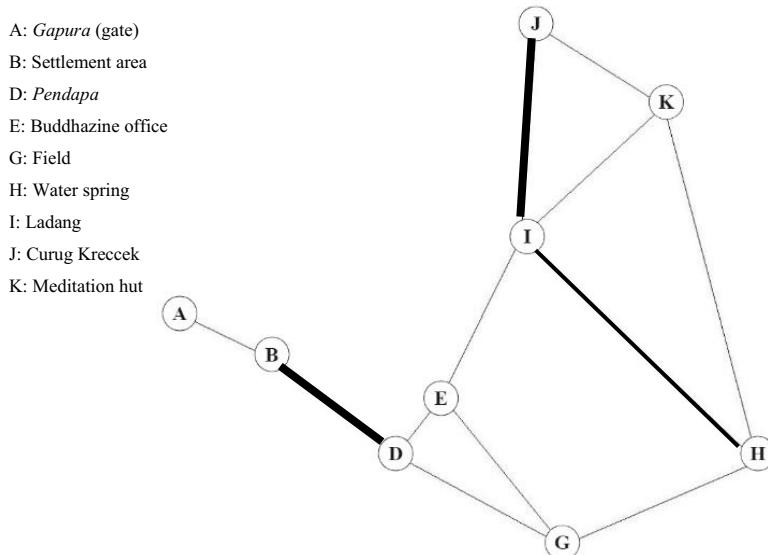
### 3.4 Space Syntax Analysis

The relationships between these spaces can be further traced through space syntax analysis using the street segment mapping [8]. This is done by dividing axial lines and observing the points which these axial lines intersect.



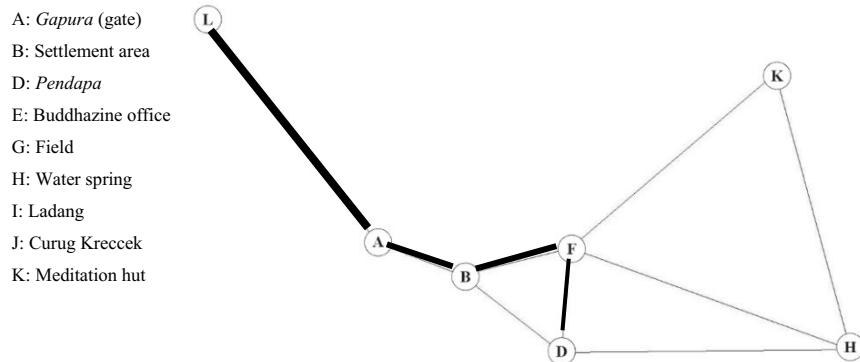
**Fig. 13.** Street segment map of Dusuk Krecek (Author, 2024)

This mapping segments the existing road network in Dusuk Krecek by connecting the axial lines. The locations of the buildings are marked to show their relationships [9]. This is further explained through the abstraction process in which the nodes are mapped (marked with a corresponding gletter) to represent each space [10]. This mapping is called a plan graph.



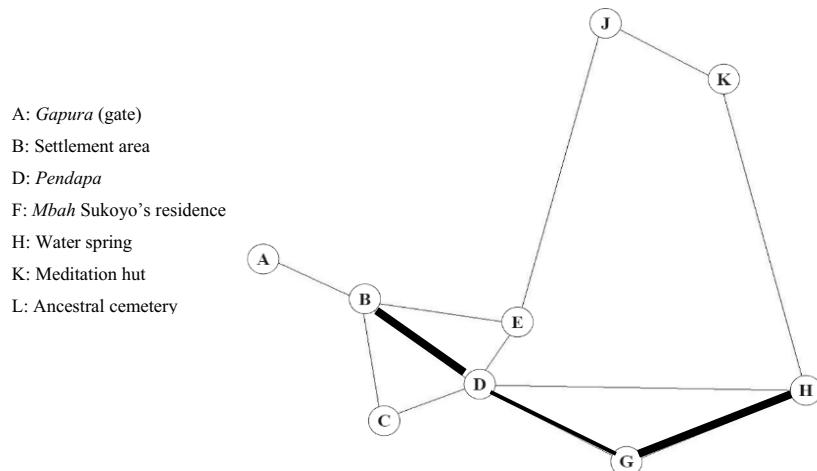
**Fig. 14.** Plan graph during *meriti dusun* (Author, 2024)

Figure 14 illustrates the plan graph of Dusun Krecek during the event of *merti dusun*. The residents of Dusun Krecek cleans the *pendapa*, the *ladang*, the water spring, and around their homes. This act of cleaning is called *besreh*. The most frequented places during *merti dusun* are the *pendapa*, the water spring, Curug Krecek, as well as the settlement area.



**Fig. 15.** Plan graph during *nyadran* (Author, 2024)

Figure 15 illustrates the plan graph of Dusun Krecek during the event of *nyadran*. During *nyadran*, *Mbah Sukoyo*, the village elder, alerts the residents to gather around the *gapura* (gate) before departing to the ancestral cemetery. The most frequented places during *merti dusun* are the *pendapa*, the water spring, Curug Krecek, as well as the settlement area.



**Fig. 16.** Plan graph on a weekday (Author, 2024)

Figure 16 illustrates the plan graph of Dusun Krecek on a weekday. On a typical weekday, most residents spend the day in the *ladang* to work as coffee farmers. The most frequented places are the *pendapa*, the water spring, and the *ladang*.

The plan graphs above show the relationships between spaces that are frequently visited during *merti dusun, nyadran*, as well as on regular days. The resulting pattern represents an archetype formed by these spaces, which has been previously identified in the place-centered mapping. As evident on the plan graphs above, the most frequented places in Dusun Krecek are the *pendapa*, the water spring, the *ladang*, and the settlement area.

### 3.5 Axial Coding

Each of these spaces have its own spatial themes. The spatial themes identified result from the understanding of the grouping of phenomena in Dusun Krecek. The theme of adaptation arises from both physical and non-physical changes within Dusun Krecek. This is evident in the community's efforts to maintain and preserve the spatial order of their settlements in accordance with ancestral mandates. The essence of this space is the conservation of area.

The theme of interaction space shows the interconnected relationships among the residents of Dusun Krecek, as well as with guests and newcomers. The openness of the Dusun Krecek community serves as the essence of the interaction space.

The theme of traditional space is formed by a community that adheres to ancestral rules and cultural practices. The current settlements were established by the ancestors of the Dusun Krecek community. These settlements are over a century old, and their layout has been shaped by the ancestors in line with their long-held philosophies. The settlement, centered around the ancestral cemetery to the west, embodies respect for the ancestors, thereby establishing its essence as a commitment to tradition.

Spiritual and religious beliefs greatly influence the community's approach to environmental conservation. The water spring is regarded as a sacred site by Dusun Krecek residents, who actively maintain its cleanliness. During certain events, offerings are made to deities believed to protect their water source. Furthermore, the settlement areas are diligently cared for to prevent environmental pollution, representing the Dusun Krecek community's respect for nature and its surroundings.

The theme of livelihoods is shaped by the majority of the Dusun Krecek population, who are coffee farmers. The fields and natural environment serve as sources of income for these farmers, leading the Dusun Krecek community to prioritize the care and preservation of their environment. Nature, which also constitutes the workspace for these farmers, is integral to the livelihoods of the Dusun Krecek community.

The grouping of phenomena obtained will be utilized as data to generate themes. The identified phenomena in Dusun Krecek indicate the presence of four primary activities within the existing spaces of the village.

### 3.6 Spatial Themes of the Living Monuments

The spatial themes identified can be derived to capture the essence of these spaces. The four spatial essences can be condensed into two core categories: the adherence to the residential space and the openness of the Dusun Krecek community within that space.

The concept of adherence to the residential space is reflected in efforts to honor the ancestors. This is evident in the residential pathway, which serves as a place of respect for the ancestors.

The concept of openness in the Dusun Krecek community within the residential space emphasizes social relationships between the Dusun Krecek community and those outside the settlement. The development of Dusun Krecek prioritizes an open and welcoming attitude as a means of preserving the residential space.

**Table 2.** Axial coding in constructing spatial themes

Areas of Observation	Phenomena	Theme	Spatial Essences
<i>Pendapa</i>	A space for social and cultural expression	Interaction	Openness
Settlement area	A way to reflect on the community's culture and honor the ancestors	Adaptation	Preservation
Surrounding nature	Nature as a place of respect	Religion	Respect
Ancestral cemetery	Ancestral cemetery is considered a sacred space	Spirituality	Compliance
<i>Ladang</i>	<i>Ladang</i> as a source of livelihoods for Dusun Krecek community	Livelihoods	Subsistence

## 4 Conclusions and Suggestions

Based on the findings of this research, a number of living monuments in Dusun Krecek has been identified through categorization of spatial phenomena and analyzed using the space syntax method.

The living monuments that have existed since the ancient times serve as spaces for social and cultural expression, and can be categorized based on the theme or essence of the space. The living monuments in Dusun Krecek can be divided into five main themes:

- Living monument as a space for interaction as a reflection of the open nature of Dusun Krecek community.
- Living monument as a space for adaptation as an effort for environmental preservation.
- Living monument as a space for tradition as a place of homage to Dusun Krecek's ancestors.

- d. Living monument as a space for religion and spirituality as a form of gratitude towards nature.
- e. Living monument as a space for livelihood as nature act as a source of life for Dusun Krecek residents.

Thus, the living monuments in Dusun Krecek must be maintained in order to adapt to global and rural developments. Although the village has experienced many changes throughout the years, Dusun Krecek's residents continue to hold firmly to the traditions and beliefs of their ancestors, whilst still preserving the sanctity of the living monuments in Dusun Krecek.

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## References

1. Chatterjee, Kunwar J., and Hond, F. den: Anthony Giddens and structuration theory. In: Management, Organizations and Contemporary Social Theory, S. Clegg and M. Pina e Cunha, Eds., Routledge, pp. 60-79 (2019)
2. Giddens, A.: The Constitution of Society: Outline of the Theory of Structuration, University of California Press, California (1984)
3. Schneider T. and Till, J.: Beyond Discourse: Notes on Spatial Agency. In Agency in Architecture: Reframing Criticality in Theory and Practice. Footprint Delft School of Design Journal **Spring2009** DOI: <https://doi.org/10.7480/footprint.3.1.702>, pp. 97-111 (2009)
4. Badan Pusat Statistik Kabupaten Temanggung: Kecamatan Kaloran dalam Angka 2021. Kabupaten Temanggung (2021)
5. Sukoyo, Interviewee, [Interview]. 4 November 2023.
6. Wardi, I. N.: Pengelolaan Warisan Budaya Berwawasan Lingkungan: Studi Kasus Pengelolaan Living Monument di Bali. Jurnal Bumi Lestari **8**(2), (2008)
7. Gehl Studio SF: Public Life Diversity Toolkit. 2015. [Online]. Available: [https://issuu.com/gehlarchitects/docs/gehl\\_publiclifediversitytoolkit\\_pag](https://issuu.com/gehlarchitects/docs/gehl_publiclifediversitytoolkit_pag). last accessed 2023/10/25
8. Corbin J. and Strauss, A.: Grounded Theory Research: Procedures, Canons, and Evaluative Criteria. Qualitative Sociology, vol. 13 (1990)
9. Pezeshki, F. Khodadadi M. and Bagheri, M.: Investigating Community Support for Sustainable Tourism Development in Small Heritage Sites in Iran: A Grounded Theory Approach. International Journal of Heritage Studies **29**(8), 773-791 (2023)
10. Suryaningsih F. and Purwestri, N.: Documenting Living Monuments In Indonesia: Methodology For Sustainable Utility. In: International CIPA Symposium, Vols. XL-5/W2, pp. 617-622 (2013)
11. Wahmi, Interviewee, [Interview]. 5 November 2023.
12. Xu, Y. Rollo J. and Esteban, Y.: Evaluating Experiential Qualities of Historical Streets in Nanxun Canal Town through a Space Syntax Approach. Buildings, 15 November 2021 (2021)

13. Putra, G. B.: Teknik Convex Mapping : Analisis Visual Space Syntax yang Bermanfaat bagi Pemula. *Jurnal Lingkungan Binaan Indonesia*, **11** (2), DOI: <https://doi.org/10.32315/jlbi.v11i2.31>, 71 -76 (2021)
14. Summers L. and Johnson, S. D.: Does the Configuration of the Street Network Influence Where Outdoor Serious Violence Takes Place? Using Space Syntax to Test Crime Pattern Theory. *Journal of Quantitative Criminology* **33**, 397–420 (2017)

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