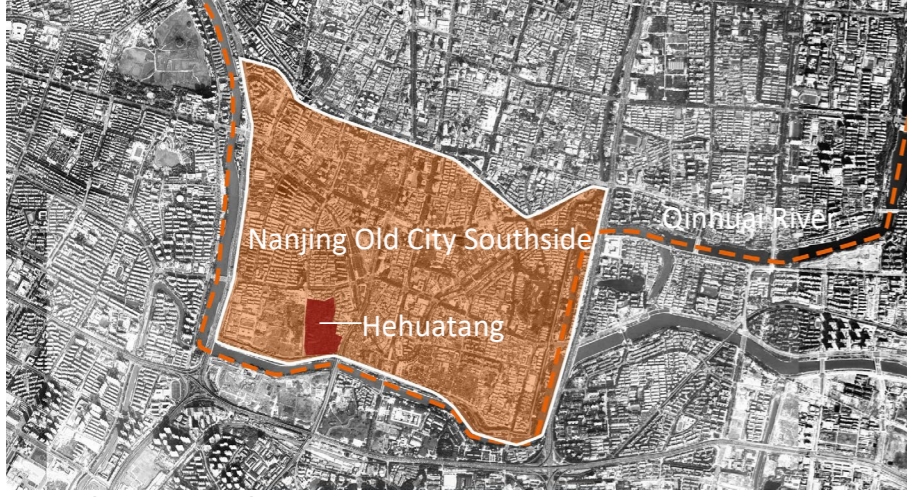


Title: Vitality and urban form in the traditional residential area



Introduction

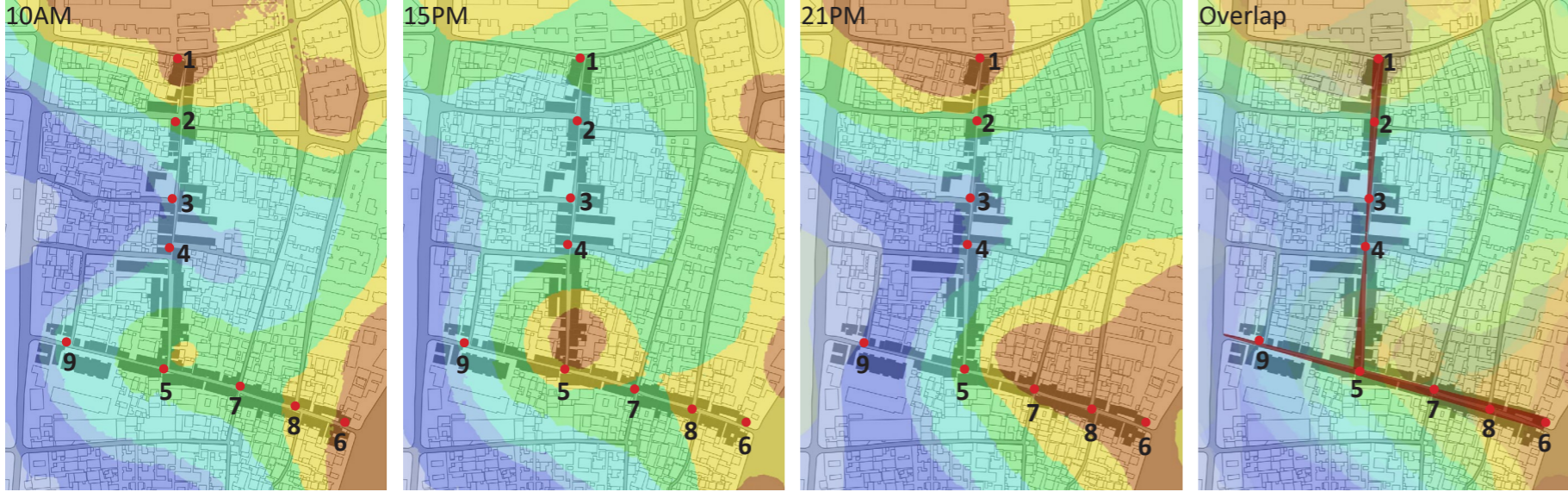
The living condition in the traditional residential area is poor. For a long time, residents have continuously transformed the original space according to their own needs, showing a continuous living state, at the same time, forming a complicated and chaotic status quo. Compared with the historical buildings, the living state and block morpho of the traditional residential areas have higher protection value. However, some practices such as reconstruction, removal of aboriginal people and overall commercialization have made it lose authenticity and vitality. Therefore, enhancing spatial vitality is an important aspect in its regeneration.

Method

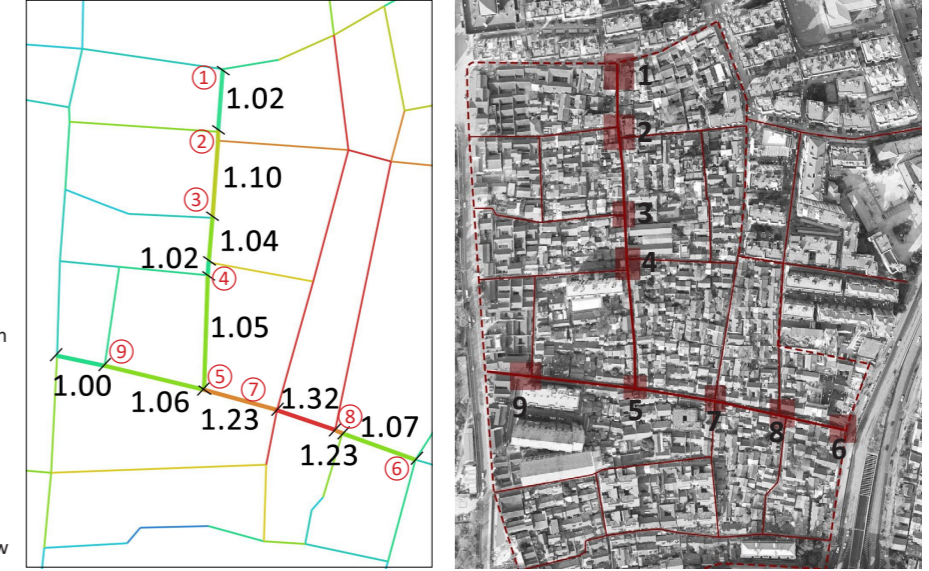
When discussing the relationship between spatial vitality and form, researchers from Delft University have put forward the Form Syntax theory, suggesting that street accessibility, building density and form type, mix degree of function are basic factors that affect urban vitality. Form Syntax is universal, and it is difficult to apply directly to the specific Chinese traditional residential areas. Therefore, this paper conducts a study based on this theory to explore the morphological factors that affect the spatial vitality in the traditional residential areas.

Taking Hehuatang area of Nanjing old city as an example, two main structural alleys were selected as the research objects: Xiaoshun Alley from north to south, Yinma alley from east to west. According to Baidu thermal map analysis in different time, the distribution of spatial vitality was obtained. Nodes with vitality mutation were selected for morphological study. Including 5 elements: street accessibility, building type, building function, plan layout and circulation organization. Then the causes of the different vitality were analyzed to summarize some common factors and related laws.

Vitality Analysis



Street Accessibility Research Nodes



Morphology Analysis

	<p>Vitality: High Street accessibility: Low Function type: Commercial&Dwelling Building type: 3 Plan layout: "T" form& Open space for business Circulation hierarchy:3</p>		<p>Vitality: Medium Street accessibility:Medium Function type:Dwelling Building type: 3 Plan layout:Moline form Circulation hierarchy:3</p>		<p>Vitality: Low Street accessibility:Low Function type: Kindergarten&Dwelling Building type: 2 Plan layout:"T" form Circulation hierarchy:3</p>
	<p>Vitality: Low Street accessibility:Low Function type: Service center&Dwelling Building type: 2 Plan layout:"T" form& Open space Circulation hierarchy:3</p>		<p>Vitality: High Street accessibility:High Function type:Dwelling Building type: 1 Plan layout:"T" form& Enlarged space Circulation hierarchy:3</p>		<p>Vitality: High Street accessibility:Medium Function type: Commercial&Dwelling Building type: 2 Plan layout:Linear form& Entrance space Circulation hierarchy:2</p>
	<p>Vitality: High Street accessibility:High Function type: Commercial&Dwelling Building type: 3 Plan layout:"+" form Circulation hierarchy:2</p>		<p>Vitality: High Street accessibility:High Function type: Commercial&Dwelling Building type: 2 Plan layout:Molineform Circulation hierarchy:2</p>		<p>Vitality: Low Street accessibility:Low Function type: Dwelling Building type: 3 Plan layout:Moline form Circulation hierarchy:3</p>

Discussion and Result

- From the thermal distribution diagram, the vitality of Xiaoshun alley first decreased and then increased from south to north. The Yinma alley gradually decreased from east to west. The street accessibility and vitality distribution are not always consistent.
- The functional types include residence, food store, barber shop, vegetable store, grocery store, kindergarten, service center. Commercial ones are mostly located in residential buildings, while service buildings are set separately. The form types include courtyard house, slope-roof house, detached house, courtyard collective house, and modern multi-story linear house. Different residential types show different living patterns. In plan layout, the "T" shape occupies the most, also existing moline and cross intersection shape which present higher street accessibility. Circulation organizations include 3 types: from street to public function, from street to house directly, from street to common space and then to private house.
- Cause analysis
 - Node1: Street accessibility is low, but the vitality increased during the existence of commercial congregations and open spaces in front of shops.
 - Node3: Low street accessibility and a large enclosed kindergarten make it have low vitality.
 - Node4: Low street accessibility, isolated service center and the independent open space make it have low vitality.
 - Node5: High street accessibility, expanded open space and direct-to-home building type contribute to its high vitality.
 - Node7\8: High street accessibility and high functional complexity make it have high vitality.
 - Node9: Low street accessibility and the negative interface of alley make it have low vitality.

Conclusion

- Street accessibility and functional complexity have a great impact on spatial vitality.
 - For large public buildings, reasonable layout and entrances need to be considered carefully.
 - Open Spaces need to be integrated with architectural function to guide people's use.
 - Small public facilities and shops can be set at the intersection of streets to form a certain concentration effect, which is conducive to the promotion of the overall vitality.
 - In the way of entrance, the direct entrance from streets and alleys is more dynamic than the common entrance space, which shows that the depth of the house needs to be controlled.
- There is a certain contradiction between spatial vitality and residential privacy demand, and it is not true that the higher the spatial vitality, the better the area. In practice, the different requirements of vitality in different parts should be judged first, and then the planning and designing can be conducted.