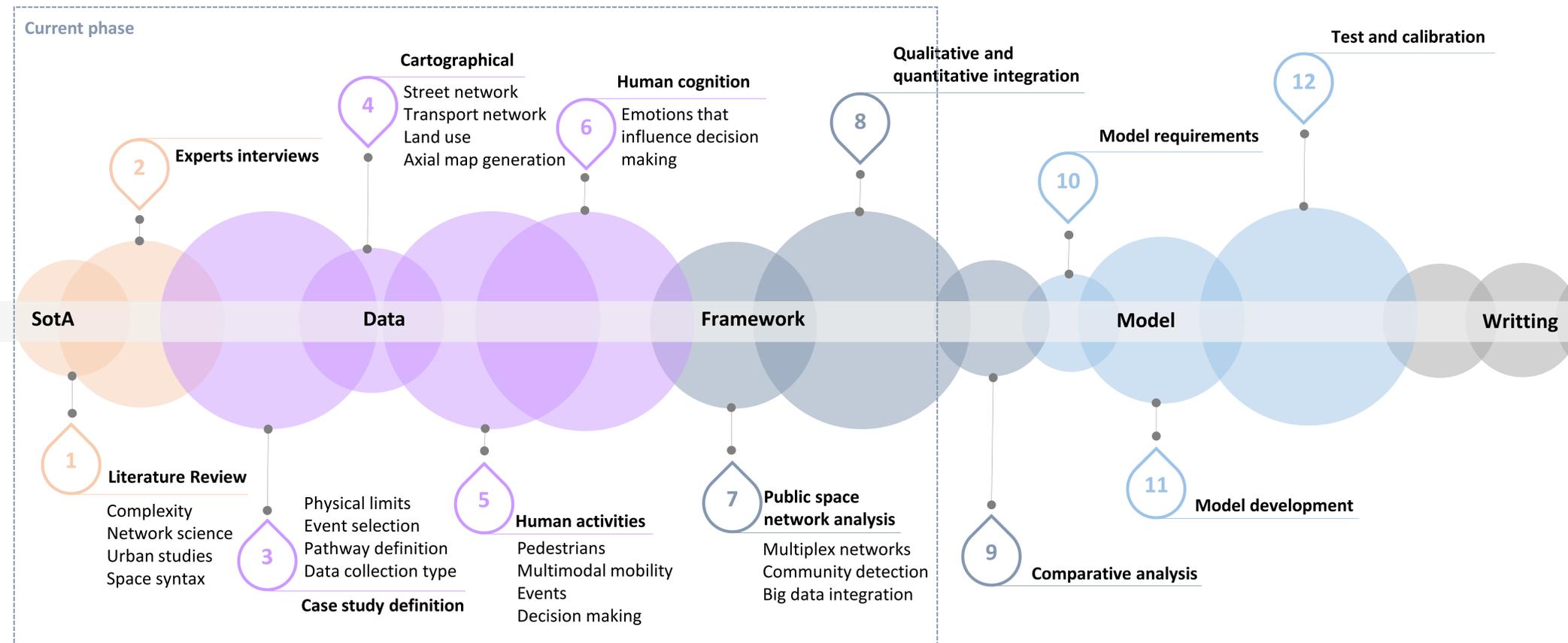


The many faces of the city: spatiotemporal dynamics and the urban limits

The aim of this study is to identify the different components of the city and how they interrelate, with a focus on the analysis of the impact of social behavior and human activities in the urban fabric. Contrarily to the amount of research on the capacity of urban morphology to condition social activities, the influence of social activities on the perception of urban space is still lacking a comprehensive research.

Three goals are envisaged for this PhD project: i) Revise and synthesize network and cognitive science methodologies applied to the planning and management of urban space and to the identification of the impact of human activities on public space, focusing on ephemeral events; ii) Identify and systematize the impact of ephemeral sociocultural events on the use and perception of public space; iii) Develop an urban simulation model that, by integrating the different dimensions of these impacts, allows an integrated and informed planning and management of the social and cultural activities in the city.

This research will contribute with methodology that enables a more effective and integrated urban and cultural planning, management and policies, giving stakeholders, namely City Councils and Cultural Institutions, information about the physical impacts of immaterial outputs of society.



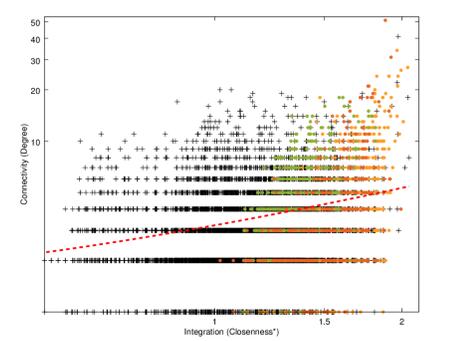
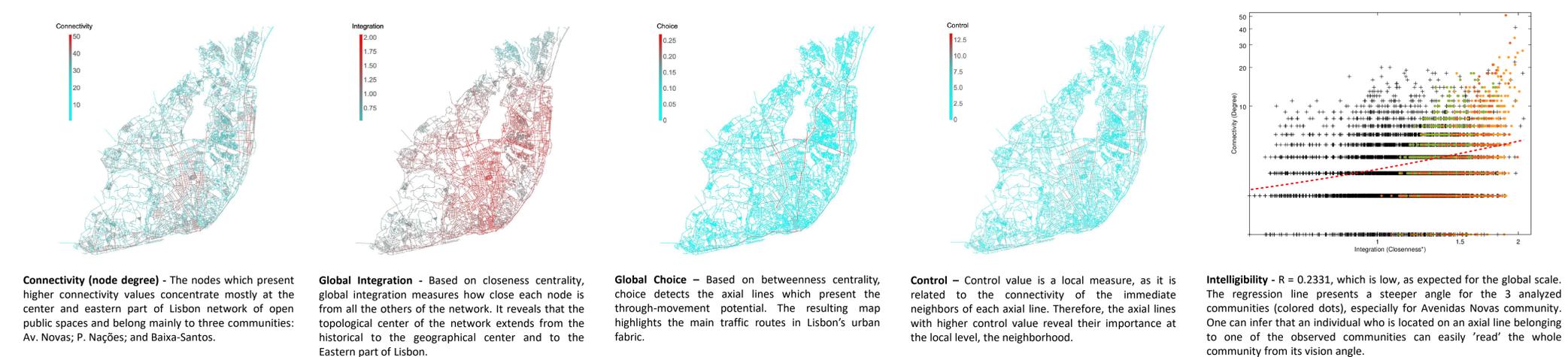
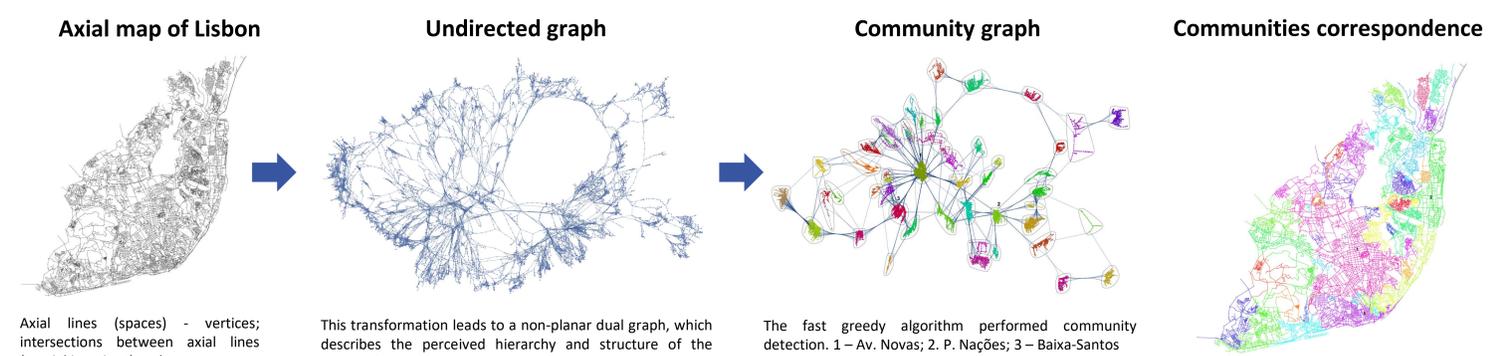
Paper 01 – APPLIED NETWORK SCIENCE, 2021, Number 6 (doi: 10.1007/s41109-021-00387-2)
Unfolding the dynamical structure of Lisbon’s public space: space syntax and micromobility data
Helena F. Almeida, Rui J. Lopes, João M. Carrilho, Sara Eloy (in print)

Space syntax analysis and data collected from e-scooters locations during one week confirmed that spatial morphology is an important factor conditioning human behavior, although other factors may coexist, such as spatiotemporal cycles, events or qualitative factors.

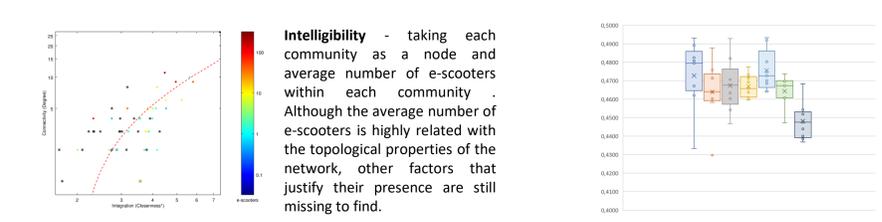
This paper investigates to what extent spatial morphology at different scales (node, community and global network) influences the use of public space by micromobility. An axial map and corresponding network for Lisbon’s walkable and open public space, and data from e-scooters parking locations, is used as case study.

Communities are identified based on the network topological structure in order to investigate how these properties are affected at different scales in the case study. The resulting axial line clustering is compared via the variation of information metric with the clustering obtained from e-scooters’ proximity.

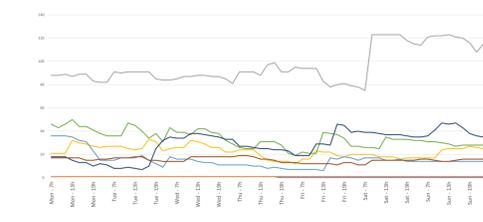
Through the comparative analysis between the main properties of the public space network of Lisbon and data collected from e-scooters locations in a timeframe, centrality becomes a dynamic concept, relying not only on the static topological properties of the urban network, but also on other quantitative and qualitative factors, since the flows’ operating on the network will operate several transformations on the spatial network properties through time, uncovering spatiotemporal dynamics.



Intelligibility - $R = 0.2331$, which is low, as expected for the global scale. The regression line presents a steeper angle for the 3 analyzed communities (colored dots), especially for Avenidas Novas community. One can infer that an individual who is located on an axial line belonging to one of the observed communities can easily ‘read’ the whole community from its vision angle.



Variation of information - between network communities and e-scooters’ clusters through time. There is no moment during the sampled time in which the e-scooters assemble is fully coincident with the community structure of the network.



Temporal variations at the local level - evolution in the number of parked scooters in some of the axial lines which presented higher values of space syntax measures.