

# WHAT INFORMATION IS IN A SPATIAL NETWORK?

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Considering spatial variables in the analysis of social and economic activity is not new, however spatial approaches are still rarely found in network studies. This paper investigates spatial networks at a micro scale by looking at the structures and logic of complex buildings in order to answer the question how the analysis of spatial networks can

add value and insight to the study of social and economic outcomes, or in short: what information is in a spatial network? Three different building types are presented (museum, office, hospital) by using empirical data collected and analysed with Space Syntax - a theory and method of spatial configuration and networks.

Space Syntax is an analysis method and theory of spatial configuration, i.e. the way in which spatial elements are interconnected to form a network of spaces. It represents the continuous flow of space as a series of linked elements, for instance rooms or corridors in a building are connected by doorways or staircases. It then analyses the resulting spatial network based on formalisations similar to those made in graph theory.

Space Syntax research has found that the quality and character of social life in a space can be associated with its location in a spatial network: **integrated** spaces (i.e. those with a higher value of closeness centrality) tend to attract more people moving through them, while **segregated** spaces (with a low value of closeness centrality) showed lesser frequentation.

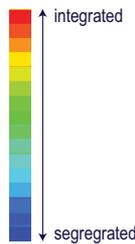
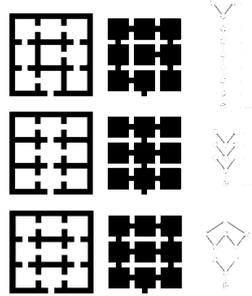
Visualisations are comparable to a heat map: integrated spaces are shown in **warm colours** (red, orange, yellow), while relative segregation is shown in **cold colours** (green, turquoise, blue).

In essence, spatial configuration shapes collective flows of movement and that in turn influences the patterns of co-presence and encounter in space, and therefore interaction patterns and more generally **social behaviours**.

Thus Space Syntax explores the relationship between space and society and thus aims at revealing the **social logic of space**.

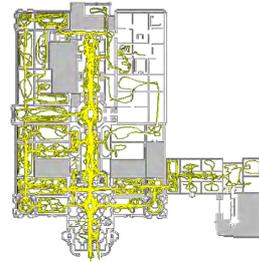
## CONCLUSIONS

Rich information is embedded and encoded in the form and structure of the spatial network itself. In addition to the pure spatial network structure, the distribution of functions in a building (e.g. the location of the photocopier in a workplace, or the location of the patient waiting area in a hospital) provide crucial information on the way the spatial network is realised and articulated.

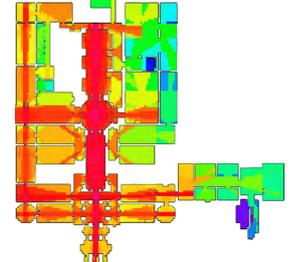


## MUSEUMS

Spatial layout can create and distribute patterns of collective movement of visitors; Two different types of museum experiences: C-spaces: sequential and constrained experience of space (strong curatorial intent); D-spaces: choice, exploration and denser encounters with other visitors (Tate Britain: ratio of C to D-spaces: 1.8; Tate Modern: 3.3)



Movement traces of visitors in first 10 minutes of their visit at Tate Britain (Hillier et al 1996)



Visibility analysis of Tate Britain (Source: Space Syntax Ltd)



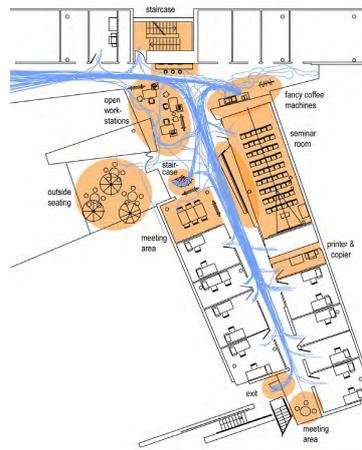
C-SPACES MODEL (Hillier & Tzortzi 2006)



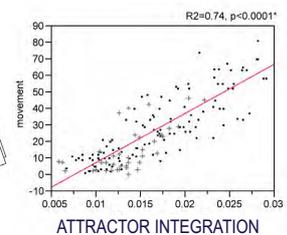
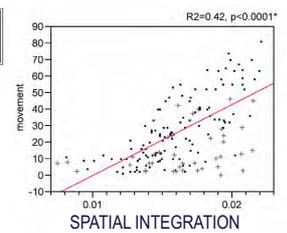
D-SPACES MODEL (Hillier & Tzortzi 2006)

## OFFICES

Placement of attractors and additional affordances to movement and interaction, e.g. photocopiers and water-coolers divert movement flows; Spatial network overlaid with the network of facilities ('Attractor Integration') accounts for vast majority of movement flows; Proximity of colleagues correlates with interaction network structures;



(Source: Sailer 2010)



## HOSPITALS

Structure of spatial network controls interface between user groups (inhabitants & visitors); Elementary building: inhabitants deep, visitors shallow ↔ reversed building (inhabitants shallow, visitors deep); Case study (hospital in NL): controlled separation of patient and caregiver spaces; easy access for patients in outlined path (shallow core building)

