# The information contents of the syntactic models

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## Abstract

The starting point for this article accepts that the syntactic model of a network (for example: a network of streets of a city) is a physical system. In addition, it is a system quite stationary, close to the equilibrium, which interacts with the surroundings through a series of ties or links (for example, when it is used as a channel for the displacements).Therefore, its adaptive capacity is low, but its configuration exerts important influence on other systems to which it is related, for example with the density of population, or the way in which people use the urban routes.

Like all systems, this one also contains information about its degree of organization. The hypothesis of this work maintains that each syntactic configuration has asociated a information measurement that can be used to express its structural complexity. In addition, we think that this measurement (or a group of values) can be used to evaluate different configurations, from the point of view of their economic and environmental efficiency, or the forms of the social use of the space, and even of the perceived images.

If such hypothesis is true, the measures of information of the syntactic models, applied to the axial lines, the convex spaces, the nodes or other metric characteristics, could serve to estimate the relevance and efficiency, " a priori ", of diverse syntactic configurations in varied contexts (residential density of population; circulation of vehicles or pedestrians), and for diverse goals of planning.

This hypothesis will be explored by calculating values of entropy for the axial lines, the nodes and the convex spaces in two quite different areas from the city of Zaragoza, but with the same surface approximately: the historical centre and an area of recent development. The first one is a traditional space with high densities of population and a very complex road network; the second is an area of single-family houses and with a simpler spatial structure, located at the periphery of the city.

The values of entropy -information, organization, diversity- obtained, will be related to other syntactic and metric parameters. One is expected to reveal significant associations. It is hoped to find, at least, indications between these sets of measures. For now only local measures of entropy will be calculated using the equation of Shannon.

We try, as an ultimate goal, to find indicators that allow us to evaluate the environmental and economic efficiency of certain syntactic configurations, to use them in an advantageous way in urban planning.

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