Ht-Index for Characterizing Street Hierarchy

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Most street networks demonstrate a striking hierarchy, implying that there are far more small streets than large ones - 80 percent small streets, yet 20 percent large ones. Interestingly, the 20 percent account for 80 percent of traffic, while the 80 percent account for only 20 percent of traffic; out of the 20 percent, there are less than one percent that constitute part of our mental maps (Jiang 2009, Jiang 2013). The notion of street hierarchy indicates that a series of scales (or sizes) ranging from the smallest to the largest constitute a scaling hierarchy. In this presentation, I will introduce the ht-index (Jiang and Yin 2014) for characterizing the street hierarchy, or scaling structure of geographic features in general. A street network has ht-index h if the pattern of far more small streets than large ones recurs ($h-1$) times at different scales. The higher the ht-index, the more complex the street network. After introduce some basic concepts such as scale, scaling, Euclidean and fractal geometry, I will showcase the application of the ht-index for a large sample of street networks in Sweden and around the world. I will further discuss some deep implications of the ht-index for better characterizing geographic forms and processes, and argue that scaling should be formulated as a law of geography.

References:
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