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A quantitative approach to the built urban environment

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This research project focuses on both the city's buildings and the organization of the built urban environment. To begin with, the buildings' shapes are translated into multiple quantitative indicators related to their size, height, compactness, or skeleton. A feature selection is then made to keep the most relevant ones. Finally, by clustering the different constructions according to the selected features, it is possible to identify a typology of buildings on the city scale.
On another scale, the shape characteristics of the buildings are also used to assemble them into coherent groups in geographic space. In order to obtain groups that are close both spatially and on the feature space, the Geo-SOM approach is used. This method thus makes it possible to obtain "neighborhoods" corresponding to spatially close and morphologically similar buildings.
These different results can be used to ensure homogeneous development within the city, to trace the stages and styles of expansion of the city, as well as to compare the internal organization of several cities.