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Spatial Data Science for Data Driven Urban Planning: The Youth Economic Discomfort Index for Rome

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Abstract : Today, a consistent segment of the world’s population lives in urban areas, and this proportion will vastly increase in the next decades. Therefore, understanding the key trends in urbanization, likely to unfold over the coming years, is crucial to the implementation of sustainable urban strategies. In parallel, the daily amount of digital data produced will be expanding at an exponential rate during the following years. The analysis of various types of data sets and its derived applications have incredible potential across different crucial sectors such as healthcare, housing, transportation, energy, and education. Nevertheless, in city development, architects and urban planners appear to rely mostly on traditional and analogical techniques of data collection. This paper investigates the prospective of the data science field, appearing to be a formidable resource to assist city managers in identifying strategies to enhance the social, economic, and environmental sustainability of our urban areas. The collection of different new layers of information would definitely enhance planners' capabilities to comprehend more in-depth urban phenomena such as gentrification, land use definition, mobility, or critical infrastructural issues. Specifically, the research results correlate economic, commercial, demographic, and housing data with the purpose of defining the youth economic discomfort index. The statistical composite index provides insights regarding the economic disadvantage of citizens aged between 18 years and 29 years, and results clearly display that central urban zones and more disadvantaged than peripheral ones. The experimental set up selected the city of Rome as the testing ground of the whole investigation. The methodology aims at applying statistical and spatial analysis to construct a composite index supporting informed data-driven decisions for urban planning.

Keywords : data science, spatial analysis, composite index, Rome, urban planning, youth economic discomfort index
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