Mapping Urban Diversity: Applications

Dan C. Baciou, Ph.D.

- In earlier articles we developed and applied a method to map urban diversity.
- We also developed theory and demonstrated several applications.
- This preprint contains additional maps of urban diversity.
- The preprint also contains simulations and proposed applications.
- The preprint will be expanded and updated over time.

March 3, 2021

Mapping Urban Diversity <https://doi.org/10.31219/osf.io/buaig>

Amsterdam

Areas with high urban diversity

Waterways and parks have not been studied on this map

Areas with average urban diversity

Amsterdam diversification map

Areas where we estimate that additional hotels could bring about a decline in urban diversity

Athens

Density

Bars

Culture

Shopping

Transport

Residential

Services

Diversity

Diversity estimated with General Diversity Index (Baciu 2021b). Parameters set to simulate interplay of factors that may support

- The parameters in the General Diversity Index can be inferred in a conventional Neural Networks architecture, as sketched below.

- The **scale** of analysis and **resolution** of diversity maps do not need to be identical.
- In a previous article (image below) we have for example used a scale of analysis courser than the resolution (the scale is 100m while the resolution is 50m). Source: Baciù & Della Pietra 2021.
- In the drawing above we sketch an example in which the scale of analysis is defined by isochrones.
- The map can be created by: 1. Calculating the isochrones of each point in urban space. 2. Counting how many different types are found in each isochrone. 3. Computing a diversity score for each isochrone. 4. Compiling a diversity map with a diversity score for each point in urban space.
- Multiple isochrones for each point can be considered and weighed. For example by calculating a diversity score for a point in urban space for 5min, 15min, and 30mins isochrones and from these numbers creating a value that takes all three into account at least to some degree.
- The isochrone map may represent well the perception of people who already know their city, the opportunities is offers, and the time required for mobility.

Bibliography

Baciu DC (2020). “Cultural Life: Theory and Empirical Testing.” Biosystems 197.104208.

DOI: <https://doi.org/10.1016/j.biosystems.2020.104208>

Baciu DC (2021a). “10 Causal Models for Life.” OSF Preprints.

DOI: <https://doi.org/10.31219/osf.io/8uyc3>

Baciu DC (2021b). “Causal Models, Creativity, and Diversity.” OSF Preprints

DOI: OSF Preprints. <https://doi.org/10.31219/osf.io/byndg>

Baciu DC, Birchall C (2021). "Mapping diversity: From ecology and human geography to urbanism and culture." OSF preprints.

DOI: <https://doi.org/10.31219/osf.io/sdvaz>

Baciu, DC, & Della Pietra, D (2021). "Data from UNESCO world heritage site demonstrate application of evolutionary dynamics in urbanism." OSF preprints. DOI: <https://doi.org/10.31219/osf.io/f43xh>

Mapping Urban Diversity <https://doi.org/10.31219/osf.io/buajg>