Mapping the cultural heritage of cities

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Modern cities are extremely versatile and can be described from different perspectives and datasets, from census data to Foursquare data [1]. In this preliminary work, our main focus is to exploit Wikipedia and Wikidata in order to gain understanding on the spatial and temporal aspects of cultural activity in cities. We adopt an historical perspective and aim at characterising the cultural activity of a city by its cultural personalities. Given a neighbourhood, who were the important poets, mathematicians or architects associated to it? Answering such questions is certainly of interest to tourists and inhabitants, in order to comprehend better their cultural heritage. From a more global perspective, such data would allow to understand the cultural organisation of cities, and its possible segregation into different types of cultural activity.

For this purpose, we are currently building a network between places and famous people in different cities. We illustrate the procedure for the city of London. We first crawl all places from the Wikidata API, such that its coordinates are known and lie inside London. For each place, we then check its Wikipedia pages and find all the links (to Wikipedia pages; external links are ignored) for which a corresponding Wikidata item is available. In the latter list, we keep only entities classified as humans and retrieve the list of occupations of the person. Applied to London, this procedure finds 2376 locations, linked to around 65k Wikidata pages, among which 18k correspond to humans. Their list of occupations has slightly more than 1k unique values, with the histogram of the 50 most popular shown in Fig.1. Different projections of the corresponding tripartite structure place–people–occupation can then be performed, for instance to assign a weighted set of categories to a place. Note that the results can be filtered by the years associated to the lifetime of the corresponding persons, and that spatial smoothing can be performed to produce continuous maps of cultural activity in different occupations.

We foresee different applications for the dataset. A straightforward scenario is to help people explore a new city accordingly to their own interests. The successful development of such a service
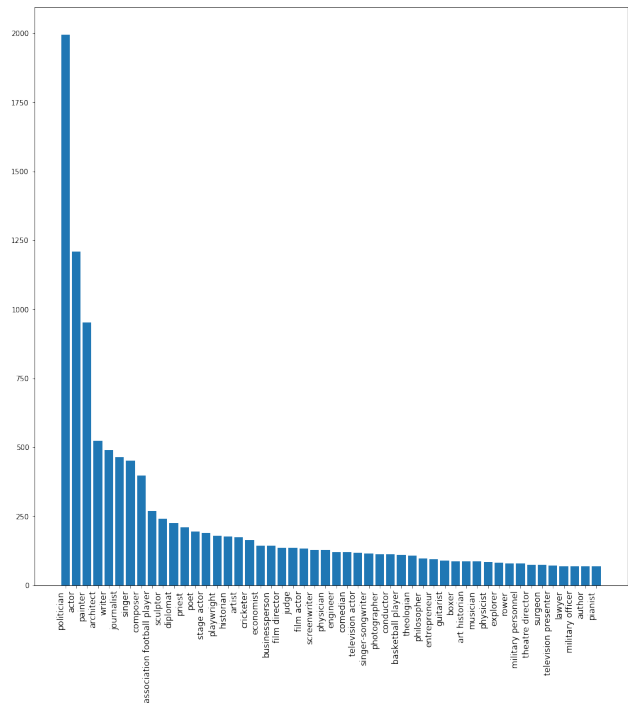
Figure 1: Histogram of occupations of people linked to places of London

additionally requires measures of importance of a place, which can be derived from the popularity of the Wikipedia page or its cultural importance, in terms of the number of languages in which it exists [2]. We are currently preparing an online service and a smartphone application for travellers based on this idea. From a more academic point of view, the dataset also raises interesting questions that we plan to investigate in the future. How heterogeneous are cities in terms of cultural activity? Do we tend to observe different patterns in different cultural domains? Is it possible to cluster cities based on their different cultural patterns? Do cities tend to exhibit monocentric or polycentric organisation? Are cultural indicators good predictors for socio-economic data and, in particular, estate price or attractiveness for business?

REFERENCES

[1] M. Barthelemy. 2016. *The Structure and Dynamics of Cities.* Cambridge University Press. https://doi.org/doi:10.1017/9781316271377
[2] Ronen S. Hu K. Lu T. Yu, A. Z. and C. A. Hidalgo. 2016. Pantheon 1.0, a manually verified dataset of globally famous biographies. *Scientific Data 3* 150075 (2016). https://doi.org/doi:10.1038/sdata.2015.75