NETSCITY tutorial: unveiling world scale scientific production and collaborations between cities

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This tutorial introduces NETSCITY (https://irit.fr/netscity), an online application to analyse and visualise world scale scientific production and collaboration data between cities. Contrary to existing tools that mainly focus on displaying co-occurrence networks, NETSCITY especially focuses on processing the geographical information comprised in bibliometric data. NETSCITY offers a fully integrated five-step solution to, 1) parse and 2) cleanse the authors’ addresses (those are extracted from a set of references given as input) prior to 3) geocoding them at the city level, 4) clustering them at the requested level of analysis (urban areas or countries), and 5) mapping them either on a world base map or in a relational space. The first part of the tutorial provides an overview of the spatial bibliometrics field; the second part addresses the issues NETSCITY intends to tackle: geocoding, clustering, counting, and mapping methods performed at the click of a mouse. Each attendee will perform spatial bibliometrics with NETSCITY during the guided tour we provide on case studies before experimenting with his/her own dataset or on a set of references extracted from the Web of Science Core Collection.

Instructors’ biography

Dr. Marion Maisonobe is the lead designer of the NETSCITY geoweb application, currently developed in cooperation with G. Cabanac and L. Jégou. She is a CNRS researcher active in the fast-growing field of Geography of Science and teaches spatial network analysis. She is a member of the f.m.r. (flows, matrices, and networks) research group and of the French Research Network on Network Analyses in the Humanities and Social Sciences. She serves in the M@ppemonde editorial board and reviewed for the Journal of Informetrics, Scientometrics, and the Annals of Regional Science journals.

Dr. Guillaume Cabanac is an Associate Professor in Computer Science at the University of Toulouse, France. His research lies at the crossroads between Information Retrieval, Digital Libraries, and Scientometrics. He teaches database design and programming. Cabanac is an elected member of the French National Board of Universities. He co-chairs the Bibliometric-enhanced Information Retrieval (BIR) workshop series held at the ECIR conference each year. He was a referee for dozens of Information Science journals and serves on the editorial board of JASIST and Scientometrics.

Aims and Learning Objectives

This tutorial introduces the novel NETSCITY web application, designed to help processing, geocoding, clustering, and mapping authors’ addresses from a set of bibliographic references. NETSCITY is able to process datasets directly extracted from Scopus or the Web of Science. It is also possible to upload, analyse, and map the geographic contents of a homemade CSV file, provided it abides by the required format. NETSCITY produces production as well as collaboration tables and maps, broken down by country or urban area. The users can modify the level of analysis (opting for country or urban areas), the counting method (opting for full or fractional counting) as well as the mapping method (network or cartographic views). This new application helps scientists, policy managers, and librarians with no programming skills to analyse and explore the world geography of sets of bibliographic references. Our tutorial aims will showcase the application, explaining its features, its strengths, and limitations to date.

Organisation of the tutorial

We designed a hands-on, Bring Your Own Device (BYOD) tutorial: attendees will perform spatial bibliometric studies using their own computer. All they need is a working Internet connection to the homepage of NETSCITY. A case study with associated sample dataset will be provided so that participants quickly start using NETSCITY and assess its effectiveness in shedding light on issues regarding spatial bibliometrics. A potential case study relates to the research on submarine robots; it is highly relevant as publications stem from scientific areas close to marine areas, thus highlighting the benefit of a spatial analysis of publishing institutions (Figure 1 from Maisonobe et al., Proceedings of the ISSI 2019).

Figure 1 – Production map for the 1,004 WOS records of the submarine robots case study, after geocoding and aggregation are performed. Fractional counts at the urban area level.

We offer participants to bring a dataset of their own (e.g., their institution’s publication records) formatted in CSV as follows: a column with a unique ID, a year column, an address column and optionally three additional columns corresponding to the “city”, “province”, and “country” as extracted from the address column.

Target Audience

NETSCITY is designed with various end-users in mind: researchers (especially in STS), policy officers, librarians, and scientists.