

Research Internship – LIP6 – Complex Networks

Computational tools for observing and analysing opinion dynamics in the media

Laboratory: Laboratoire d’Informatique de Paris 6 (UMR 7606)

Team: Complex Networks (<http://www.complexnetworks.fr/>)

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Motivations: Social media and the digitisation of news are having far-reaching effects on the way individuals and communities communicate, organise, and express themselves. Can the information circulating on these platforms be tapped to better understand and analyse the enormous problems facing our contemporary society? Could this help us to better monitor the growing number of social crises due to cultural differences and diverging world-views? Studying the structure of debates in the public sphere requires sophisticated methods for the analysis of information flows between individuals. How information is shaped and broadcasted by mass media? How to describe the way opinions are discussed in social media? Debates are often represented as complex entanglements of such social interactions, embedded in space and time, and displaying a multilevel structure: From individual to institutional discourses; From regional to international matters; From the fast dynamics of media “buzzes” to the slower dynamics of social controversies.

Theoretical Work: To address these challenging issues, this internship aims at developing new tools for the analysis of multidimensional and multilevel networks in social sciences. Such tools could build on recent work in *graph theory* regarding the “link stream” representation of evolving networks, which provides a novel and intuitive formalism for the spatio-temporal description of social interactions by focusing on their causal structure (who interacts with whom, when) and concealing for a moment their content (how, why, about what). This internship does not require any preliminary knowledge about these two theoretical frameworks. However, it requires a strong interest in the development of end-user tools (software or Web interface) in Python or in R, for researchers in social sciences.

Applied Work: The usage of developed tools will be challenged by empirical work on real data. For example, the internship could focus on the analysis of opinion dynamics in social media, such as Twitter, by looking at a particular debate (*e.g.*, climate change, presidential elections, Brexit). In this case, a focus will be put on the study of typical interaction patterns between actors of the debate, such as: polarisation, leadership, communitarianism, and solidarity behaviours. This internship hence requires a curiosity for some of the research questions that arise in social sciences about social or mass media, and might lead to joint work with researchers in geography, political sciences, or media studies.

Research Context: This internship will take place in the “Complex Networks” team of the LIP6 (Laboratoire d’Informatique de Paris 6), located in Paris. It will be funded by the European project ODYCCEUS (Opinion Dynamics and Cultural Conflicts in the European Space).

References:

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- [3] Matthieu Latapy, Tiphaine Viard, and Clémence Magnien. Stream graphs and link streams for the modeling of interactions over time. *Social Network Analysis and Mining*, pages 1–29, 2018.
- [4] Audrey Wilmet and Robin Lamarche-Perrin. Multidimensional outlier detection in temporal interaction networks: An application to political communication on Twitter. *ArXiv*, abs/1906.02541, 2019.