Opinion Dynamics and Political Conflicts in the Media - A Complex Network Perspective

Mots clés :
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- Co-encadrant(s) :
- Unité de recherche : Laboratoire d'informatique de Paris 6
- Ecole doctorale : École Doctorale Informatique, Télécommunications, Électronique de Paris
- Domaine scientifique principal: Divers

Résumé du projet de recherche (Langue 1)

(Research context) This PhD position will be conducted in the Complex Networks team of the Computer Science Laboratory of Paris 6 (LIP6, UMR 7606), and in collaboration with other partners of the European H2020 ODYCCEUS project "Opinion Dynamics and Cultural Conflicts in European Space" that started in January 2017 (https://www.odycceus.eu/). (Project) 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 exploited 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 is information 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. To address these challenging issues, this PhD position aims at developing new methods for the analysis of multidimensional and multilevel networks in social sciences. First, by building on recent work in (dynamical graph theory) regarding the “link stream” representation of evolving networks [4], 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). Second, by integrating recent developments in (graph compression) [3], which builds on information-theoretical data compression [2], to provide a macroscopic perspective on such interaction structures and thus achieve a global understanding of complex interaction patterns. The efficiency of the proposed analysis methods will then be evaluated by empirical work on real data, in collaboration with researchers in media studies, in political sciences, and in quantitative geography that are working on the ODYCCEUS project. First, by focusing on the analysis of opinion dynamics in social media, such as Twitter, and looking at the topology and dynamics of interactions related to a particular debate ([e.g.], climate change, presidential elections, Brexit). Here, 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. Second, by focusing on the analysis of conflicting world views in mass media [1], for example by modelling the news about international conflicts as a dynamical graph between countries and media outlets (citations in articles) or between couples of countries (co-occurrences in articles). The world view of different media outlets will then be compared by graph analysis, thus allowing to exhibit particular behaviours depending on the geographical, political, and cultural interests of the media. (Requirements) Note that this PhD position does not require any preliminary knowledge of the hereabove mentioned theoretical frameworks (dynamical graph and graph compression), but however requires the capacity to work with abstract formalisms in general, in order to build generic and sound methods within the domain of theoretical computer science. This PhD position also requires a genuine interest for interdisciplinary work, and in particular a curiosity for some of the research questions that arise in social and political sciences about traditional media and social media.

Résumé du projet de recherche (Langue 2)

(Expected contributions) - Developments in graph theory for the analysis of dynamical and multilevel networks: for example, by building on the “link stream” formalism [4] and on information-theoretical graph compression [3]. - Implementation and documentation of algorithms, analysis, and visualisation tools. Integration of these tools to a software that will be developed within the ODYCCEUS project: the “Opinion Observatory”. - Empirical validation of the theoretical contributions in collaboration with social scientists on several case studies regarding European debates or conflicts ([e.g.], refugee crisis, Brexit, COP21, European elections). (Complementary work) - Learning about theoretical work in media studies and in political sciences about the theory of agenda-setting to fit the designed methods to the needs of sociological and political analysis. - Comparing developed methods with those that will be developed in parallel by other partners of the ODYCCEUS project ([e.g.], spacial interaction models in quantitative geography, agent-based opinion dynamic models in computational sociology). - Dealing with real, complex, and large-scale data. - Dissemination of the contributions through publications, demonstrations, and networking, in particular during the consortium meetings of the ODYCCEUS project.

Informations complémentaires (Langue 2)