How are user attitudes influenced by the information they are exposed to?

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Summary

The fact that contentious topics tend to polarize users is not news anymore, but the online social networks changed the dynamics of discussions and, with them, are believed to cause even more polarization [1]. This in turn influences important social processes, such as election or the fact that one's country should stay or exit the European Union and the key to understanding these dynamics is held within how users discuss these subjects [2-4].

This project aims to understand how people's stance on contentious issues is influenced by the information diffusions they are exposed to. Our incipient research concerning the discussion on Reddit around Brexit indicates that users change their attitude depending on what content they are exposed to. In this project, we intend to uncover the precise interaction patterns that are most effective in swaying user attitude, and accurately predict what would be a users' opinion in the close future, based on their past actions and the discussion they were exposed to recently.

This project proposes to jointly use social community detection developed at the University Jean Monnet [7,8], and information diffusions analysis tools [9] currently under development at the University of Technology Sydney to analyse user activity within particular discussion topics together with their stance. More precisely, in this project we will develop upon recently proposed information diffusion mechanisms [5,6] to build spatio-temporal modelling tools, which allow understanding the diffusion paths of information through particular online communities. This project will advance both the theoretical knowledge in the spatio-temporal modelling information diffusion and detecting online communities, and also will build an online platform for visualising in real time the spread of particular discussion topics via popular platforms (e.g. Twitter). The students in this project will employ two readily available datasets around Brexit: a Reddit dataset and a Twitter dataset.

Context and opportunities. The work in this project will follow upon incipient analysis on the same datasets, and profiling measure which show the feasibility of the approach. The student who will undertake this project will be based in St Etienne, at the Hubert Curien laboratory.

A successful project is likely to open the student the path to a PhD thesis at the University of Technology Sydney, in Australia.

Pre-requisites:
- good math skills: probabilities and stochastic calculus; linear algebra
- good programming skills
- background Machine Learning and/or Data Science methods;
- performing (computer) experiments and analysing results
- Git, R/Python, desire to make sense of real data and solve real issues.

Expected results
- **Theoretical:**
  - State of art on information diffusion in online communities
  - Design a framework for analysing diffusion paths of information through particular online communities
- **Practical:**
  - Software implementation
  - Experiments on datasets

Keywords: machine learning, online communities, information diffusion in social media, stochastic modelling.

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