Master 2 Internship proposal
(academic year 2019-2020)

Title: Dynamics of social attention, the role of behavioural cost.

Although the mechanisms that build the opinion of one individual on a particular topic are out of the reach of the standard tools of Physics, the understanding about how a large group of individuals reaches consensus on a topic may be enlightened by formulating the problem in terms of a dynamical system of interacting agents.

Different kind of models describing the way in which opinions form and disseminate in a social group have been proposed (see [1] for a review). Starting from a stylized model of a society, the role of different ingredients suggested by studies of Sociology and Social Psychology have been investigated: binary or multiple discrete opinion sets, continuous opinion models, continuous opinions and discrete actions, heterogeneous agents, bounded confidence, stubbornness, contrarian effects, etc. This modelling effort, along with the recent development of social networks and the tremendous increase in computer power, have led to the emergence of the so called « Computational Social Sciences ».

In this internship the student will address the problem of the dynamics of the social attention on a given topic. In 1972, A. Downs introduced the concept of *« Issue-Attention Cycle »* to describe the life cycle of a new topic entering the social discussion: the attention that the pubic pays to it undergoes different phases that go from acknowledgment, to euphoria and finally decreases until the topic is replaced by another one [2]. Since then, several works have tried to identify and measure this cycle in different social, cultural and political contexts, most of them via a statistical treatment of media coverage limited to some particular subject like climate change, public health problems or security issues.

In order to understand this problem several properties of the system have to be considered, as for example: What is the role of the behavioural cost entailed by the opinion change? How the total amount of resources and its distribution in the society helps to face that cost? How the different topics requiring public attention compete to capture public attention? Which is the real influence of mass media?

This internship, proposed in the framework of the OpLaDyn *« Understanding Opinion and Language Dynamics using massive data »* project, winner of the Round 4 of the TransAtlantic Platform Digging into Data http://project.u-cergy.fr/~opladyn/ . As it is situated at the crossroads of several disciplinary fields, it will provide the student the occasion to experience working in an multi-disciplinary environment.

The student will be part of the local team of OpLaDyn, composed of three senior and two junior researchers (PhD and a Post-Doc), working on other aspects of the same project. She/he will have access to all the benefits of a regular member of the OpLaDyn team, and of the laboratory LPTM. Moreover, Cergy-Pontoise University is a partner of the Institute of Complex Systems of Paris-Ile de France (ISCpif) which opens to the candidate the access to its services if needed.

Working environment : Laboratoire de Physique Théorique et Modélisation LPTM
UMR8089 CNRS-Université de Cergy-Pontoise. 2 Av Adolphe Chauvin 95302, Cergy-Pontoise.
Profile of the candidate : this internship is open to students of master in Physics, Mathematics and Computer science, interested in interdisciplinary applications. Knowledge on Dynamical Systems, Complex Networks, Statistical Physics would be appreciated. Programming skills are required.
Duration: 5 months, typically February-June 2019 (possibility of extension to a PhD research subject via the application to local financial supports).
Allowance: French reglamentary internship allowance ~ 550€/month
Contact : Dr Laura Hernández at Laura.Hernandez@u-cergy.fr

References:

[1] *Statistical Physics of Social Dynamics* C. Castellano, S. Fortunato, and V. Loreto, Reviews of Modern Physics, vol. 81, pp. 591–646, 4 2009.
[2] *Up and Down With Ecology: The "Issue-Attention Cycle*, A. Downs, “Political theory and public choice : the selected essays of Anthony Downs”, pp. 38–50, 1972.