

Internship 2026/2027

Year: M2

Laboratory : Centre de Physique Théorique (CPT)

Research Team : Physique Statistique et Systèmes Complexes

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Project Title : Opinion dynamics on temporal networks

Keywords : Complex networks, opinion dynamics, adaptive networks

Description: Numerous models have been proposed to describe the evolution of opinions in a population [1,2]. These models are built from 2 parts: one describes the evolution of the opinions of two agents when they interact (with the underlying hypothesis that interactions tend to make opinions closer); the second describes the structure of interactions in the population, generally described by a network. While most studies consider such structures as fixed, they actually vary in time and need to be described through the framework of temporal networks [3,4].

Few studies have considered the impact of the temporality of interactions on the dynamics of opinions. The project will consist in the adaptation and simulation of models of opinion dynamics on temporal networks, given either by synthetic models or by empirical data sets (e.g. from SocioPatterns [5]), as well as on randomized structures to examine the roles of the various temporal properties of the networks. The models will be further refined to take into account the diversity of social influence weights, and also to include adaptivity (feedback of the opinion differences on the network structure).

References:

- [1] Castellano, Fortunato, Loreto, Statistical Physics of Social Dynamics, Reviews of Modern Physics 2009, <https://arxiv.org/abs/0710.3256>
- [2] Starnini et al, Opinion dynamics: statistical physics and beyond, <https://arxiv.org/abs/2507.11521>
- [3] Holme, Saramaki, Temporal networks, <https://arxiv.org/abs/1108.1780>
- [4] Gelardi, Le Bail, Barrat, Claidière, From temporal network data to the dynamics of social relationships, <https://arxiv.org/abs/2103.11755>
- [5] www.sociopatterns.org