OMNI | RÉUNIS

One Health Modelling Network for Emerging Infections

Réseau une seule santé sur la modélisation des infections

Super Spreader Seminar Series 2025

Featured Speaker:
Xuzhe Qian

Xuzhe Qian is a PhD candidate at the School of Mathematical Sciences, Fudan University, mentored by Professor Wei Lin. He is currently a visiting scholar at LAMPS, York University, under the guidance of Professor Huaiping Zhu

Xuzhe Qian is a PhD candidate at the School of Mathematical Sciences, Fudan University, mentored by Professor Wei Lin. He is currently broadening his academic experience as a visiting scholar at LAMPS, York University, under the guidance of Professor Huaiping Zhu. Xuzhe's research interests span a wide range of interdisciplinary areas, including complex networks, biomathematics, social computing, and the control theory of complex systems. Currently, he is focused on social opinion dynamics, with particular attention to how micro-level individual characteristics-such as personal response patterns, social network structures, and diverse sociopsychological factors-shape emergent macroscopic phenomena, including consensus formation, disagreement, and polarization. His work seeks to uncover the complex underlying mechanisms that connect individual traits to large-scale collective opinion behaviors. Xuzhe is also dedicated to integrating data-driven and model-driven methodologies within the One Health framework, investigating the interplay between opinion dynamics and behavioral responses. Particularly, he focuses on how public perceptions of diseases and the adoption of non-pharmaceutical personal interventions influence the spread and control of epidemics. He aims to develop a multidisciplinary framework that both deepens our theoretical understanding of complex social systems and provides practical insights for public policy and decision-making in public health and social governance.

Seminar #30

Does opinion polarization necessarily imply conflict? Modelling and modulation

ABSTRACT: Divergent opinions resulting from polarization are widespread across various fields, including economics, technology, and politics, and are often considered as social threats. Numerous studies were therefore devoted to achieving consensus. However, we will show that, polarization is inevitable when individuals exhibit black-and-white thinking (BWT), a previously underappreciated mechanism that drives adaptive consolidation of opinions. We also show that the primary social threats do not arise directly from polarization itself but rather from conflicts between connected individuals holding divergent opinions. By developing a networked dynamical model incorporating BWT and analyzing the pattern boundaries, we find that polarization does not necessarily imply conflict. Instead, the conflict intensifies through accumulating unstable eigenmodes, a process that is greatly influenced by network topology. This finding helps us elucidate how conflicts evolve across different social networks, and, more importantly, provides insights into developing effective modulation strategies to mitigate conflicts, even when polarization persists.

Moderated by:

Dr. Jacques Bélair

Professor of Applied Mathematics, University of Montreal. Mathematical modeller in physiology (currently haematology, cardiac arrhythmias in the past) and epidemiology (mainly vector-borne diseases, but respiratory virus of late) and Co-Director of the Canada Centre for Disease Modelling (CCDM)

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Hybrid Seminar - Zoom & In Person
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