OMNI | RÉUNIS
One Health Modelling Network for Emerging Infections | Réseau une seule santé sur la modélisation des infections

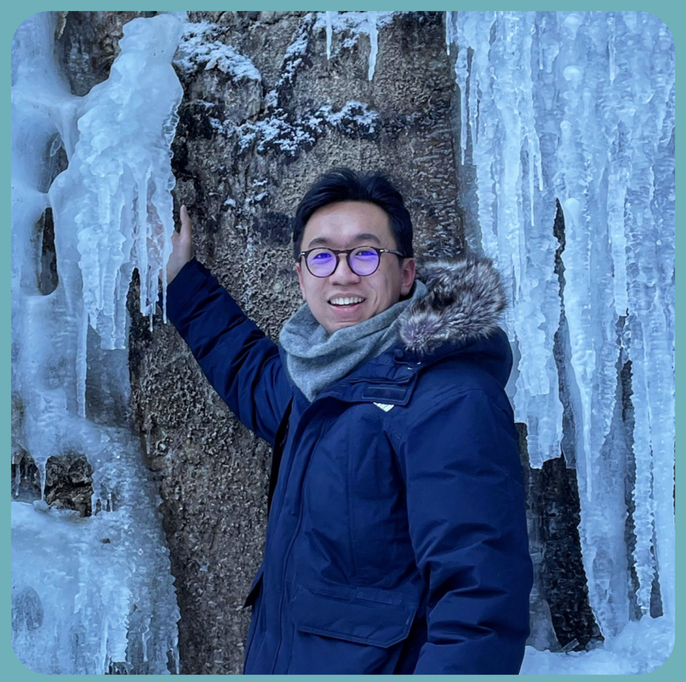
OMNI-REUNIS Super-Spreader Seminar Series

These seminar series is intended to provide faculty members, OMNI-RÉUNIS affiliates and HQPs a platform to present their research, share experiences and foster collaboration among OMNI-RÉUNIS, the Emerging Infectious Disease Modelling (EIDM) networks, and the scientific community.

EARLY DETECTION OF OUTBREAKS USING FEATURE-BASED TIME SERIES CLASSIFICATION FOR RISK-MISJUDGMENT REDUCTION

Zoom (Virtual Seminar) | Thursday, Feb 1, 2024 | 11:00 am-12:00 pm EDT

REGISTER HERE



SHAN GAO

MEET THE PRESENTER

Shan Gao is a Ph.D. student at the University of Alberta, under the supervision of Dr. Hao Wang and Dr. Mark Lewis. His Ph.D. study focuses on mathematical biology, interpreting and solving biological and ecological questions using mathematical and statistical tools. Currently, he is attempting to use early warning signal (EWS) techniques to tackle real-world problems, including the detection of impending disease outbreaks.

Funded & Supported by:
Natural Sciences and Engineering Research Council of Canada | Conseil de recherches en sciences naturelles et en génie du Canada | Canada
Public Health Agency of Canada | Agence de la santé publique du Canada
science | YORK UNIVERSITÉ UNIVERSITY
CDM Centre for Disease Modelling | CMM Centre de la modélisation des maladies

Follow us:
omni-reunis.ca
@OMNI_REUNIS
@OMNI-REUNIS
@OMNI-REUNIS
4700 Keele St, Toronto, ON M3J 1P3 CA

OMNI | RÉUNIS
One Health Modelling Network for Emerging Infections | Réseau une seule santé sur la modélisation des infections

OMNI-REUNIS Super-Spreader Seminar Series

These seminar series is intended to provide faculty members, OMNI-RÉUNIS affiliates and HQPs a platform to present their research, share experiences and foster collaboration among OMNI-RÉUNIS, the Emerging Infectious Disease Modelling (EIDM) networks, and the scientific community.

SEMINAR TITLE AND ABSTRACT

EARLY DETECTION OF OUTBREAKS USING FEATURE-BASED TIME SERIES CLASSIFICATION FOR RISK-MISJUDGMENT REDUCTION

A key determinant of weighting the preventative measures for infectious diseases is early detection of outbreaks. Once triggered, the impact of an outbreak persists, making a return to a post-pandemic state extremely challenging. In this study, we propose a novel framework using the feature-based time series classification (TSC) method to forecast the occurrence or absence of an outbreak. We find that incipient differences between the pre-transition sequence (pre-pandemic) and null bifurcation sequence (normality) can be detected before the occurrence of outbreaks. These distinctions are reflected in 22 statistical features (22SF) and 5 early warning signal indicators (5EWSI) from incidence sequences, allowing the framework to effectively discriminate these two scenarios in synthetic data. All classifiers following the framework show efficacy in handling cases far from the outbreak time and accommodating varying sequence lengths. Additionally, we conduct three real case studies involving influenza incidence data from the United Kingdom, COVID-19 cases from 18 countries, and SARS data from Hong Kong, with one classifier exhibiting consistently good performance on these empirical testing sets. The emergence and re-emergence of infectious disease are inevitable, however, early detection of forthcoming outbreaks through this framework can aid in implementing optimal interventions and reduce misjudgments of risks.

Zoom (Virtual Seminar) | **Thursday, Feb 1, 2024** | **11:00 am-12:00 pm EDT**

REGISTER HERE

Funded & Supported by:
Natural Sciences and Engineering Research Council of Canada | Conseil de recherches en sciences naturelles et en génie du Canada | Canada
Public Health Agency of Canada | Agence de la santé publique du Canada
science | YORK UNIVERSITÉ UNIVERSITY
CDM Centre for Disease Modelling | CMM Centre de la modélisation des maladies

Follow us:
omni-reunis.ca
@OMNI_REUNIS
@OMNI-REUNIS
@OMNI-REUNIS

4700 Keele St, Toronto, ON M3J 1P3 CA