



NERCCS 2024 - Program

March 20 - Wednesday

9:15 - 10:00 Chair *Erik Bollt* (Location: Barben rooms - “upstairs”)

Using Machine Learning to Improve Modeling of Complex Dynamical Systems

Brian Hunt, University of Maryland

10:30 - 12:30 - Contributed talks sessions

Dynamic Network

Chair *Edmilson Roque* - (Location: Barben rooms - “upstairs”)

10:30 - 11:00

Uncovering the universal nature of citation networks: From science of science to law of law and patterns of patents

Sadamori Kojaku, Binghamton University

11:00 - 11:30

Q-Learning Dynamics in Vaccination: A Double-Edged Sword for Addressing Vaccine Hesitancy

Atticus McWhorter, Dartmouth College

11:30 - 12:00

Dynamics of synchrony patterns in networks

Edmilson Roque dos Santos, Clarkson University

12:00 - 12:30

Deriving Dynamical Model Equations from Temporal Network Data Using a Graph Rewriting Framework

Hiroki Sayama, Binghamton University

Network applications

Chair *Mintao Liu* (Location: Cheel Commons - “downstairs”)

10:30 - 11:00

Redefining Complexity Science Using Functional State Spaces

Andy E. Williams, Nobeah Foundation

11:00 - 11:30

Revealing the Transition of Exploration Modes in Human Mobility Networks

Lu Zhong, Rensselaer Polytechnic Institute



11:30 - 12:00

Tangent functional connectomes uncover more unique phenotypic traits

Mintao Liu, Purdue University

12:00 - 12:30

Evaluating trajectories derived from dynamic functional connectivity across fMRI conditions

Si Thu Aung, State University of New York at Buffalo

14:45 - 15:30 Chair *Jeremie Fish* (Location: Barben rooms - “upstairs”)

Modeling Biological Networks using Omics Data

Kimberly Glass, Harvard Medical School

16:00 - 18:00

Data-driven Methods for Complex Systems -

Chair *Keiji Hayashi* - (Location: Barben rooms - “upstairs”)

16:00 - 16:30

Spatio-Temporal Multivariate Correlation Analysis of the Global Human Rights Dataset

Amanda Goodrick, State University of New York at Binghamton

16:30 - 17:00

Enhancing Electrical Network Vulnerability Assessment with Ensemble and Deep Learning Techniques

Ayman S. Akash, North Dakota State University

17:00 - 17:30

Data-driven time-dependent three-dimensional magnetohydrodynamics (MHD) simulation for the solar corona

Keiji Hayashi, New Jersey Institute of Technology

17:30 - 18:00

Non-Spatial Hash Chemistry as a Minimalistic Open-Ended Evolutionary System

Hiroki Sayama, Binghamton University

Social Networks

Chair *Damian Sowinski* - (Location: Cheel Commons - “downstairs”)

16:00 - 16:30

Why can't we agree? The Consensus Problem in Politics of Heterogeneous Agents

Damian Sowinski, University of Rochester



16:30 - 17:00

Effect of recommending users and opinions on the network connectivity and idea generation process

Sriniwas Pandey, Binghamton University

17:00 - 17:30

Exploring Social Networks: An Analysis of Intra-organizational Networks

Ximeng Chen, Sacred Heart University

17:30 - 18:00

Game Theory and Nuclear Strategy: An Abstract Model for Evaluating Risk of Thermonuclear War

Matthew Christ, Binghamton University

March 21 - Thursday

9:15 - 10:00 Chair *Charles Liang* (Location: Barben rooms - “upstairs”)

Predictive and affordable simulation of wall-bounded turbulent flows

George Ilhwan Park, University of Pennsylvania

10:30 - 12:30

Dynamic Network

Chair *Charles Liang* - (Location: Barben rooms - “upstairs”)

10:30 - 11:00

Group-structured evolutionary game dynamics with environmental feedback

Katherine Betz, State University of New York at Buffalo

11:00 - 11:30

An Application of Tensors in the Stochastic Reaction Diffusion Master Equation

Md Mustafijur Rahman, The University of Alabama

11:30 - 12:00

Dunbar’s Number in Motion: Agent-Based Simulations of Friendship Formation

Christopher Cooke, Binghamton University

12:00 - 12:30

SHARPer: Large Eddy Simulations of A Ducted Wind Turbine

Charles Liang, Clarkson University

Network applications

Chair *Hiroki Sayama* - (Location: Cheel Commons - “downstairs”)

10:30 - 11:00

Urban Circuitry: Unveiling Accessibility in Complex Networks

Bibandhan Poudyal, University of Rochester

11:00 - 11:30

Network-based analysis of the effect of blast-induced concussions on animal brains

Zeynep Ertem, Binghamton University

11:30 - 12:00

A S3XY Analysis of Tesla’s North America Supercharger Network

Luke Netto, Binghamton University

12:00 - 12:30

Exploring the Impacts of the Complex Interplay Between Waning Immunity and Disease Fatality on the Topology of Scale Free Networks

ThankGod Ifreke Sylvanus Ikpe, Tohoku University, Japan

14:45 - 15:30 Chair *Brian Helenbrook* (Location: Barben rooms - “upstairs”)

Environment-adaptive machine learning potentials for atomistic simulations of materials under extreme conditions

Ngoc Cuong Nguyen, MIT

16:00 - 18:00

Fluid Dynamics

Chair *Brian Helenbrook* - (Location: Barben rooms - “upstairs”)

16:00 - 16:30

The role and impact of converging flows toward Bipolar Magnetic Regions

Kinfe Gebreegzabihar, Aksum University

16:30 - 17:00

Insights into Chemical Mechanical Polishing (CMP) performance using Computational Fluid Dynamics (CFD)

Atefeh Sadrimofakham, Clarkson University

17:00 - 17:30

Large-Eddy Simulation of Turbulent Flows Around Two Canoe Paddles

Peter Parrish, Clarkson University

17:30 - 18:00

Generalising Convective Instability Analysis for Spatially Varying Non-constant Problems with a Finite Domain

Tony Abrantes, Clarkson University



Data-driven Methods for Complex Systems

Chair Jeremie Fish - (Location: Cheel Commons - “downstairs”)

16:00 - 16:30

A Measure of Interactive Complexity in Network Models

Will Deter, Binghamton University

16:30 - 17:00

Network Classification Based on Network Structural Properties

Saiful Islam, State University of New York at Buffalo

17:00 - 17:30

Laplacian pseudospectral analysis for finite perturbations away from synchronization

Jeremie Fish, Clarkson University

March 22 - Friday

9:15 - 10:00 Chair *Erik Bollt* (Location: Barben rooms - “upstairs”)

How to Evaluate Each Component of a Closed-Loop Supply Chain Network Using New Metrics from Social Network Analysis

Golshan Madraki, Clarkson University

Microplastics Pollution in the Rural Rivers of Upstate New York

Abul Baki, Clarkson University

10:30 - 12:30

Fluid Dynamics

Chair Goodarz Ahmadi - (Location: Barben rooms - “upstairs”)

10:30 - 11:00

Rolling Detachment Mechanism in Turbulent Flows for Charged Rough Bumpy Particles

Abbas Khanmohammadi, Clarkson University

11:00 - 11:30

Numerical Investigation of Indoor Particle Transport Using Lagrangian Method

Amirmasoud Anvari, Clarkson University

11:30 - 12:00

CHORUS++ Simulation Jupiter’s Convection Zone

Maxwell Stephan, Clarkson University

12:00 - 12:30

Explicit Large Eddy Simulations of Two Naval Propulsion Units

Stephen Monroe, Clarkson University



10:30 - 12:30

Data-driven Methods for Complex Systems

Chair Shweta Singh - (Location: Cheel Commons - “downstairs”)

10:30 - 11:00

Spatial and Temporal Variability of Dissolved Organic Carbon in Adirondack Lakes

Manas Bhole, Syracuse University

11:00 - 11:30

The Preservation of Input/Output Directed Graph Informativeness under Crossover

Andreas Pape, Binghamton University

11:30 - 12:00

A Qualitative Approach for Detection of Emergent Behaviors in Dynamical Systems

Shweta Singh, Northeastern University

12:00 - 12:30

Identifying Buffet Oscillations using Sliding-Window Dynamic Mode Decomposition

Sathsara Dias, Clarkson University

Poster session

March 21, Thursday 18:00 - 20:00

Location: Cheel Commons - “downstairs”

Adaptability reveals the healthcare system resilience to pandemics

Dimitri Lopez, Rensselaer Polytechnic Institute

Self-Organization in Non-Equilibrium Thermodynamic Systems

Georgi Georgiev, Assumption University

Analyzing the Feature Space of Physiological Signals in Relation to Mental Workload

Martin Duffy, Clarkson University

Graph Neural Network Model Reveals Transcriptomic Differentiation in Bronchopulmonary Dysplasia

Matthew Jehrio, University of Rochester

Bio-Inspired Drone Swarm Movement via Boid and Evolutionary Algorithms

Michael Magid, Binghamton University

Exploring Urban Traffic Dynamics: A Simulation-Based Study of Autonomous and Traditional Vehicles

Miriam Flores Castillo, Binghamton University

Toward understanding genomic segmental duplications by network analysis across multiple species

Saiful Islam, State University of New York at Buffalo

Analyzing Patient Reviews on Google Map Hospital Profiles through Neural Embedding and Network Modeling

Xin Wang, Binghamton University

Enhancing Prenatal Care through Machine Learning: A Comprehensive Analysis of Maternal Factors for Predicting Neonatal Birth Weight

Zahra Mahdavi, Clarkson University