



# 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

**TBA**

Jeremie Fish, Clarkson University

## **March 22 - Friday**

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

**TBA**

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 Amanda Goodrick - (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