

NERCCS 2025 Program Schedule

April 9 - 11, 2025
Binghamton, NY, United States

Allocated Presentation Time:

- Keynote talks: 40 min talk + 10 min Q&As
- Contributed Talk Session talks: 15 min talk + 5 min Q&As
- Posters: Throughout the conference (especially during lunch breaks)

Locations:

- SH: Symposium Hall
- ES: ES 2008
- RT: Rotunda

Day 1 (Wednesday April 9th, 2025)

8:00 AM - 4:00 PM: *Registration open*

9:00 AM - 9:20 AM: Opening Remarks [SH]
- Special opening address by Binghamton University President Harvey Stenger

9:20 AM - 10:10 AM: **Keynote 1 [Bernard M. and Ruth R. Bass Center for Leadership Studies Keynote Talk]: Mirta Galesic** (remote talk) [SH]
"Networks of Beliefs in Individual and Collective Minds"

(10:10 AM – 10:30 AM: 20 minutes for coffee break & transition)

10:30 AM - 11:50 AM: **Parallel Sessions**

Contributed Talk Session 1: Machine Learning Applications in Complex Systems
[SH]

- #44 Declan A. Norton, Edward Ott, Andrew Pomerance, Brian Hunt and Michelle Girvan, Tailored Forecasting from Short Time Series via Meta-learning

- #30 Mario Franco, Gerardo Febres, Nelson Fernández and Carlos Gershenson, The Art of Misclassification: Too Many Classes, Not Enough Points
- #26 Neil Maclaren, Kazuyuki Aihara and Naoki Masuda, Spatial early warning signals for dynamics on complex networks
- #47 Sadamori Kojaku, Rachith Aiyappa, Munjung Kim, Ozgur Can Seckin, Yong-yeol Ahn and Jisung Yoon, Implicit degree bias in the link prediction task

Contributed Talk Session 2: Economics and Education [ES]

- #54 Christopher Zosh, Nancy Dhameja, Yixin Ren and Andreas Pape, Agent-Based Econometrics: A Guide and General Method for Estimating Parameters and their Confidence Intervals in Agent-Based Simulations
- #17 Evangelos Katsamakos and Oleg Pavlov, University as a Platform: Systems and platform thinking for business model innovation in higher education
- #50 John O'Meara and Ashwin Vaidya, A Complex Systems Approach to Student Learning and Meaning-Making in Mathematics
- #71 Tessa K. Lawler, Sarah Phillips and Peter Sheridan Dodds, Computational Philology: Applying allotaxonomy to English-language translations of Homeric Epic

12:00 PM - 1:30 PM: **Lunch Break and Posters [RT]**

1:30 PM - 2:20 PM: **Keynote 2: Zoran Obradovic [SH]**

"Lifting the Fog by Harnessing Interactions Across Diverse Systems"

(2:20 PM – 2:30 PM: 10 minutes for transition)

2:30 PM - 3:50 PM: **Parallel Sessions**

Contributed Talk Session 3: Sponsored Session: Data Science and AI for Scientific Discoveries [SH]

- #8 Thomas Varley, "Dark information" in complex systems: exploring emergent structures with multivariate information theory.
- #40 Xuanchi Li, Xin Wang and Sadamori Kojaku, Near Linear-time Network Sampling for the Binary and Enhanced Configuration Models
- #58 James Hartz and Sarah Muldoon, Estimating Uncertainty in Network Measures and Structures Arising from Noisy Data
- #11 Shilong Yu, Neil MacLaren and Naoki Masuda, Using cross-covariance of node states to potentially improve early warning signals

Contributed Talk Session 4: Emergent Phenomena in Dynamical Systems I [ES]

- #2 Nam Le, Richard Watson, Josh Bongard, Chris Buckley and Michael Levin, Emergent Collective Reproduction via Evolving Neuronal Flocks
- #72 Malbor Asllani, Pattern Formation Framework for Chimera States in Complex Networks
- #20 Chanon Thongprayoon and Naoki Masuda, Tie-decay networks with splines
- #64 Ravi Chepuri and Michelle Girvan, Exploring the role of heterogeneity in reservoir computing dynamics

(3:50 PM – 4:10 PM: 20 minutes for coffee break)

4:10 PM - 05:00 PM: **Keynote 3 [School of Systems Science and Industrial Engineering Keynote Talk]: Alessandro Vespignani [SH]**
"Navigating Complexity: Human Mobility Networks for Pandemic Prediction and Surveillance"

Day 2 (Thursday April 10th, 2025)

8:00 AM - 4:00 PM: *Registration open*

9:00 AM - 9:10 AM: Opening Remarks [SH]

9:10 AM - 10:00 AM: **Keynote 4: Deepak Dhar** (remote talk) [SH]
"Modelling Proportionate Growth in Animals"

(10:00 AM – 10:20 AM: 20 minutes for coffee break & transition)

10:20 AM - 12:00 PM: **Parallel Sessions**

Contributed Talk Session 5: Communications in Social Systems [SH]

- #36 Markus Hofer, Jan Korbel and Stefan Thurner, Phase Transitions in Socially Balanced Systems: Why More Interactions Drive Polarization
- #37 Haoyang Qian and Malbor Asllani, Explosive opinion spreading with polarization and depolarization via asymmetric perception
- #61 Yan Hao, Tate Tower, Hannah Lax, Marc-Thorsten Hütt and Daniel Graham, Survivability of colliding-spreading messages on scale-free networks
- #62 Malak Fora, Zhiyuan Wang, Bethany Teachman, Laura Barnes and Congyu Wu, Predicting Interpersonal Perception in Face-to-Face Communication Using Video-Based Cross-Recurrence Quantification Analysis (CRQA)

- #13 Ali Nasirzonouzi and Carlos Gershenson, The Dynamics of Word-of-Mouth Marketing: An Agent-Based Modeling Approach to Message Credibility and Consumer Engagement

Contributed Talk Session 6: Emergent Phenomena in Dynamical Systems II [ES]

- #34 Elizabeth Castro, Ferdinand Schweser, Sarah Muldoon, John Leddy and Mohammad Haider, Adolescent Structural Whole-Brain Changes After Sport-Related Concussion
- #35 Yoshiaki Fujita and Carlos Gershenson, How Are Cortical PV / SST Interneurons Differentiated?
- #15 Oleksandr Hulianskyi, The Evolution of Global Gold and Copper Trade Networks
- #68 Leila Hedayatifar, Alfredo J. Morales, Dominic E. Saadi, Rachel A. Rigg, Olha Buchel, Amir Akhavan, Egemen Sert, Aabir Abubaker Kar, Mehrzad Sasanpour, Irving R. Epstein and Yaneer Bar-Yam, Predicting System Dynamics of Universal Growth Patterns in Complex Systems
- #59 Buddhika Nettasinghe, Allon Percus and Kristina Lerman, How Out-Group Animosity Shapes Partisan Divisions: A Dynamical Model of Affective Polarization

12:00 PM - 1:30 PM: **Lunch Break and Posters [RT]**

1:30 PM - 2:20 PM: **Keynote 5: Réka Albert [SH]**

"Boolean Modeling of Biological Systems: How to Refine a Model to Improve Its Predictive Power"

(2:20 PM – 2:30 PM: 10 minutes for transition)

2:30 PM - 3:50 PM: **Parallel Sessions**

Contributed Talk Session 7: Sponsored Session: AI and Society [SH]

- #55 Akshay Gangadhar and Hiroki Sayama, Opinion dynamics and the unpredictability of opinion trajectories in an adaptive social network model
- #14 Danushka Bandara, Ruhuan Liao and Leslie Abbott, Classification of human trust in AI using brain activity data
- #23 Kaj Hansteen Izora and Christof Teuscher, Exploring the Potential of Large Language Models (LLMs) to Simulate Social Group Dynamics: A Case Study Using the Board Game "Secret Hitler"
- #49 Sadamori Kojaku, Visualizing ideas in motion through researcher mobility with Lorentzian hyperbolic space

Contributed Talk Session 8: Healthcare and Public Health [ES]

- #63 Hicham El Baz and Yong Wang, Integrating AGVs into Complex Systems: Enhancing Efficiency and Cost Savings in Healthcare Material Handling
- #18 Brandon Bedenbender, Agent-Based Modeling to Stress Test New York State Healthcare Robustness
- #31 Lu Zhong, Pei Sen and Jianxi Gao, Patient flow networks absorb healthcare stress during pandemic crises in the United States
- #41 Bibandhan Poudyal, Gourab Ghoshal and David Soriano-Panós, Can Mobility Save Us From Both? Unraveling the Dynamics of Dual Disease Spread

(3:50 PM – 4:10 PM: 20 minutes for coffee break)

4:10 PM - 05:00 PM: **Keynote 6: Jeremy Blackburn [SH]**
"AI and Society: How Can We Get It Right?"

Day 3 (Friday April 11th, 2025)

8:00 AM - 12:00 PM: *Registration open*

9:00 AM - 9:10 AM: Opening Remarks [SH]

9:10 AM - 10:00 AM: **Keynote 7: Sarah Muldoon [SH]**
"Quantifying Individual Differences in Brain Network Evolution"

(10:00 AM – 10:20 AM: 20 minutes for coffee break & transition)

10:20 AM - 11:20 AM: **Parallel Sessions**

Contributed Talk Session 9: Complex Networks I [SH]

- #43 Chirantha Piyamal Tharusha Bandara and Naoki Masuda, Enhancing Spatial Early Warning Signals: Optimized Node Selection for Tipping Point Detection
- #38 Haoyang Qian and Malbor Asllani, Dense communities drive epidemic spreading in structured populations
- #25 Ziqi Guo, Jack Felag, Jordan Rozum, Xuan Wang, Luis Rocha and Rion Correia, Focused digital cohort selection from social media using the metric backbone of biomedical knowledge graphs

Contributed Talk Session 10: Complexity Reduction [ES]

- #21 Bisna Mary Eldo, Sarbendu Rakshit and Naoki Masuda, Dimension reduction for graphon nonlinear dynamical systems
- #22 Tucker Mastin and Christof Teuscher, Coarse-Graining Spiking Reservoirs: Reducing Reservoir Size While Preserving Critical Dynamics
- #46 Sarbendu Rakshit and Naoki Masuda, Low-dimensional approximations in hypergraph dynamical systems

(11:20 AM – 11:30 AM: 10 minutes for transition)

11:30 AM – 12:20 PM: **Keynote 8: Joaquin Goni [SH]**

"Human Brain Functional Connectivity: Fingerprinting and Reconfiguration"

12:20 PM - 1:30 PM: **Lunch Break and Posters [RT]**

1:30 PM – 2:30 PM: **Contributed Talk Session 11: Complex Networks II [SH]**

- #33 Elisa Ceñal, Mario Franco, Carlos Gershenson and Nelson Fernández, Refining Soccer Analytics: A Classificability-Based Approach to Identifying Key Performance Metrics
- #27 Saiful Islam, Alber Aqil, Omer Gokcumen and Naoki Masuda, Interpretable community detection in multilayer gene co-expression networks
- #56 Akshay Gangadhar, Yoshiaki Fujita and Sadamori Kojaku, Centrality as a form of higher-order cumulative advantage

2:30 PM - 3:20 PM: **Keynote 9: David Sloan Wilson [SH]**

"Complex Systems Science and Generalized Darwinism: Two New Bodies of Information in Need of Integration"

3:20 PM - 3:50 PM: **Closing and Award Ceremony [SH]**