



## Northeast Regional Conference on Complex Systems (NERCCS 2020)

*Date:* April 2-3, 2020  
*Location:* **online only**  
*Webpage:* <https://nerccs2020.github.io/>

- Invited Talks and Track-A Contributed Talks will be available through **Zoom meeting A**.
- Track-B contributed talks will be available through **Zoom meeting B**.

Speakers can simply click to join the meeting and then share their screen.

### Program

Thursday, April 2

9:00 – 9:15	Welcome remarks
9:15 – 9:45	Invited talk 1 - <b>Kenny Joseph</b> – The Complex Nature of Bias
9:45 – 10:45	Keynote 1 - <b>Kerstin Dautenhahn</b> – Social Robots: Past, Present and Future
10:45 – 11:00	Short break
11:00 – 12:20	Contributed talks 1 (dual sessions: 4x20 min talks) 1A. <b>Collective behavior</b> 1B. <b>Socioeconomic systems</b>
12:20 – 1:30	Lunch break
1:30 – 2:00	Invited talk 5 - <b>Sucheta Soundarajan</b> – The Fairness of Information Flow in Social Networks
2:00 – 3:00	Keynote 2 - <b>Marianthi Markatou</b> – Evidence and Uncertainty for Complex Health Interventions in Complex Health Systems
3:00 – 3:10	Short break
3:10 – 4:30	Contributed talks 2 (dual sessions: 4x20 min talks) 2A. <b>Network theory I</b> 2B. <b>Dynamical systems</b>
4:40 – 6:10	Poster Session (each presenter will host their own Zoom meeting)

## Friday, April 3

9:00 – 9:15	Announcements
9:15 – 9:45	Invited talk 3 - <b>Saray Shai</b> – Percolation-based Network Algorithms for Destroying/Protecting Modular Networks
9:45 – 10:45	Keynote 3 - <b>Eugene Stanley</b> – Using Statistical Physics Concepts to Offer Insights into Economic Questions
10:45 – 11:00	Short break
11:00 – 12:20	Contributed talks 3 (dual sessions: 4x20 min talks) 3A. <b>Network theory II</b> 3B. <b>Spatial patterns &amp; PDEs</b>
12:20 – 1:30	Lunch break
1:30 – 2:00	Invited talk 4 - <b>Winnie Chen</b> – Driver Feedback Design: from Manual Driving to Automated Driving
2:00 – 2:30	Invited talk 2 - <b>Nishant Malik</b> – Uncovering Dynamical Transitions in Paleoclimate Time Series
2:30 – 3:00	Invited talk 6 - <b>Irina Benedyk</b> – Cooperative Arrangements in Intermodal Transportation: Who is paying for these decisions?
3:00 – 3:10	Short break
3:10 – 4:30	Contributed talks 4 (dual sessions: 4x20 min talks) 4A. <b>Agent-based modeling</b> 4B. <b>Neuro-systems</b>
4:30 – 4:45	Closing remarks and awards for best posters.

# Contributed Talks

## (1A) Collective Behavior – Thursday April 2, 11:00am–12:20pm (chair: Erdem Sariyuce)

- 1A-1. **Dobromir Dotov**. Dynamic Interactive Minimal Artificial Intelligence with Examples from Human Sensorimotor Control
- 1A-2. **Tomasz Raducha, Mateusz Wilinski, Tomasz Gubiec and Gene Stanley**. Statistical mechanics of a coevolving spin system
- 1A-3. **Zhao Song and Dane Taylor**. Diffusion on Multiplex Networks with Asymmetric Coupling
- 1A-4. **Lana Delasanta, Dobri Dotov, Laurel Trainor and Edward Large**. Analyzing Group Drumming Using a Dynamical Systems Approach

## (1B) Socioeconomic systems – Thursday April 2, 11:00am–12:20pm (chair: Leila Hedayatifar)

- 1B-1. **Ashwath Ashok, Carlin Reyen, Afzal Shah, Carol Reynolds and Hiroki Sayama**. Correlation Between Socioeconomic Risk Factors and HTT Gene Mutations Leading to Neurodegenerative Autosomal-Dominant Diseases
- 1B-2. **Siyu Huang, Qinghua Chen and Xiaomeng Li**. A Study on the Evolution of Global Migration Pattern based on Complex Network
- 1B-3. **Zeinab S. Jalali, Krishnaram Kenthapadi and Sucheta Soundarajan**. Towards Diversifying Organizational Networks through Employee Assignments
- 1B-4. **Jaron Cui, John Guo, Daksh Mehta, Ameet Ashok, Carol Reynolds and Hiroki Sayama**. The Viability of Wealth-Based Post-Secondary Educational Affirmative Action

## (2A) Network theory I – Thursday April 2, 3:10pm–4:30pm (chair: Jean-Gabriel Young)

- 2A-1. **Valerio Guarrasi, Penghang Liu and A. Erdem Sariyuce**. Temporal Network Motifs: Models, Limitations, Unification
- 2A-2. **Shun Cao and Hiroki Sayama**. Entropy-based Detecting of Dynamic States in Temporal Networks
- 2A-3. **Jeremy Kazimer and Dane Taylor**. Effect of Network Perturbations and Community Structure on Graph Von Neumann Entropy
- 2A-4. **Timothy Larock, Vahan Nanumyan, Ingo Scholtes, Giona Casiraghi, Tina Eliassi-Rad and Frank Schweitzer**. Analyzing DeBruijn Graphs to Discover Over- and Under-represented Pathways

## (2B) Dynamical systems – Thursday April 2, 3:10pm–4:30pm (chair: Gino Biondini)

- 2B-1. **Sean Cornelius and Chia-Hung Yang**. Emergence of Laplace-distributed Growth Rates in Complex Systems
- 2B-2. **Shweta Singh and Mieczyslaw M. Kokar**. Reduced Complexity Approach for Emergent Behavior Detection
- 2B-3. **Joseph Johnson, Nathan White, Alain Kangabire and Daniel Abrams**. A Mathematical Model of Anisogamy
- 2B-4. **Erik Bollt**. Geometric Considerations of a Good Dictionary for Koopman Analysis of Dynamical Systems

**(3A) Network theory II – Friday April 3, 11:00am–12:20pm (chair: Sean Cornelius)**

- 3A-1. **Jean-Gabriel Young, George T. Cantwell and M. E. J. Newman.** Efficient and Fully Bayesian Inference of Complex Networks from Noisy Data
- 3A-2. **Ryan Gallagher, Jean-Gabriel Young and Brooke Foucault Welles.** Diversity of Core-Periphery Structure in Real Networks
- 3A-3. **Philip Chodrow.** Moments of Uniformly Random Multigraphs with Fixed Degree Sequences
- 3A-4. **István Kovács.** Utilizing Complex Networks with Error Bars

**(3B) Spatial patterns & PDEs – Friday April 3, 11:00am–12:20pm (chair: Bernard Ricca)**

- 3B-1. **Jonathan Lottes and Gino Biondini.** Dispersive Shocks in the Lugiato-Lefever Equation
- 3B-2. **Daniel Cooney.** PDE Models of Multilevel Selection: Cooperation and the Shadow of Lower-level Selection
- 3B-3. **Bong Jae Chung and Ashwin Vaidya.** A Two-Phase Model for Mucosal Aggregation and Clearance in the Human Tear Film
- 3B-4. **Hiroki Sayama.** Enhanced Information Gathering May Intensify Disagreement Among Groups

**(4A) Agent-based modeling – Friday April 3, 3:10pm–4:30pm (chair: Hiroki Sayama)**

- 4B-1. **Alina Vereshchaka and Wen Dong.** Resource Allocation During Natural Disasters Using Multi-agent Systems
- 4B-2. **Matthew Barlin and Michael Zargham.** Emergent Price Dynamics through Simulation of Modeled Multi-market Investor Agents
- 4B-3. **Surendra Hazarie, Hugo Barbosa, Adam Frank, Ronaldo Menezes and Gourab Ghoshal.** Uncovering the Role of Spatial Constraints in Physical and Virtual Mobility
- 4B-4. **Simone Cassani, Joseph Benson, Mariya Bessonov, Korana Burke, Maria-Veronica Ciocanel, Daniel Cooney and Alexandria Volkening.** Mathematical Models of Pedestrian Movement in Large Lecture Halls

**(4B) Neuro-systems – Friday April 3, 3:10pm–4:30pm (chair: Istvan Kovacs)**

- 4A-1. **James Wilson, Skyler Cranmer and Zhong-Lin Lu.** A Hierarchical Latent Space Network Model for Population Studies of Functional Connectivity
- 4A-2. **Cong Ye, Konstantinos Slavakis, Sarah Muldoon, Johan Nakuci and John Medaglia.** Online Multilayer Brain-Network State Clustering
- 4A-3. **Marinho Lopes, Jiaxiang Zhang, Dominik Krzemiński, Khalid Hamandi, Qi Chen, Lorenzo Livi and Naoki Masuda.** Recurrence Analysis of Dynamic Functional Brain Networks
- 4A-4. **Johan Nakuci, Thomas J. Covey, Janet L. Shucard, David W. Shucard and Sarah F. Muldoon.** A single-trial Clustering Approach to Examining Neural Variability During Working Memory