# 25TH ANNIVERSARY OF THE VIRTUAL CENTER FOR SUPERNETWORKS **SYMPOSIUM**

**20-21 November 2026**

Isenberg School of Management

UMass Amherst



**Professor Anna Nagurney**
Eugene M. Isenberg Chair
in Integrative Studies
Director, Virtual Center
for Supernetworks

The Virtual Center for Supernetworks

UMass Amherst | Isenberg School of Management *Operations & Information Management*

# Welcome Message

## Welcome to the 25th Anniversary of the Virtual Center for Supernetworks Symposium!

*A message from the Director of the Virtual Center for Supernetworks*

About the time that I was named the John F. Smith Memorial Professor in 1998, John F. Smith's son, "Jack" Smith Jr., then CEO and Chairman of General Motors, and donor of the chaired professorship, came to UMass Amherst for a visit. He gave a brilliant talk in Memorial Hall at UMass Amherst that inspired me. Through our mutual love of transportation and seeing the potential for the integration with telecommunications (and other network systems), after discussions on future research plans with him, the genesis for intense research and education on supernetworks came about. I realized that there was a need to write a book defining the field. I recruited June Dong, PhD '94 to co-author the book with me since we had collaborated together. We completed the book in the Summer of 2001. In those days, the author printed out the book on high brightness paper and shipped it to the publisher for printing. The publisher, Edward Elgar, was based in the UK. As it happened on September 11, 2001, the package containing the book was at John F. Kennedy International Airport ready to be loaded on that evening's flight. Needless to say, it did not make it, until after a lengthy delay.

At the same time, Dean Tom O'Brien, realizing that I had received several National Science Foundation grants and AT&T Industrial Ecology Fellowships, and that I had a cohort of students working with me, supported my efforts to establish a Virtual Center for Supernetworks. I did not see a female leading a center and thought it important to move forward. I decided that the Virtual Center for Supernetworks and its signature activities would be coordinated through its website. On November 21, 2001, the website, now known as http://supernet.isenberg.umass.edu, became active.

# Welcome Message

I had no idea that I would be writing this 25 years later. Over 40 individuals have been Center Associates with 26 now engaged. 17 completed their PhDs as Doctoral Student Center Associates and several contributed as undergraduates. There are currently Center Associates on 3 continents. At UMass, the Center has collaborated with over half a dozen departments. Due to the internal evolution of Isenberg, the Center has been housed in 3 different departments over the years.

In collaboration with the UMass Amherst INFORMS Student Chapter, the Center has brought well over 150 speakers to campus including a Nobel Prize winner. Beyond UMass, the Center has supported and has engaged in activities at the University of Catania, Italy, Harvard's Radcliffe Institute for Advanced Study, the Rockefeller Foundations's Bellagio Center on Lake Como, and in Greece at several Dynamics of Disasters conferences.

I would be remiss if I did not acknowledge those who helped fund the Center and its activities including: the John F. Smith Memorial and the Eugene and Ronnie Isenberg Chair Endowments, the Isenberg PhD Program, the National Science Foundation, the Rockefeller Foundation, the AT&T Foundation, the Radcliffe Institute for Advanced Study at Harvard University, the Fulbright Program, the Advanced Cyber Security Center, the UMass Amherst Office of Global Affairs, All Souls College at Oxford University, the School of Business, Economics and Law at the University of Gothenburg, SOWI at the University of Innsbruck, and the University of Catania.

Finally, I would like to thank Isenberg Dean Anne P. Massey and Professor Senay Solak, the OIM Department Chair and now the John F. Smith Memorial Professor, and the countless members of the Isenberg staff and administrators who have assisted in Center activities, including those who helped with this Symposium. I also would like to thank all those in Isenberg's TSS who have kept our server running for this past quarter century.



***Anna Nagurney***
*Eugene M. Isenberg Chair in Integrative Studies*
*Director of the Virtual Center for Supernetworks*
*Isenberg School of Management, UMass Amherst*

# Friday, November 20th

## Isenberg School of Management
## Room 210

*8:30am* Doors Open

*Check-in for in-person registrants*
*Name badges, programs, and coffee provided*

*9:00am* Welcome Remarks

***Anna Nagurney***
*Eugene M. Isenberg Chair in Integrative Studies and*
*Director of the Virtual Center for Supernetworks*
*Isenberg School of Management, UMass Amherst*

***Tilman Wolf***
*Deputy Chancellor for Operational &*
*Organizational Strategies and*
*Senior Vice Provost for Academic Affairs*
*UMass Amherst*

***Senay Solak***
*John F. Smith Memorial Professor and*
*Department Chair of Operations & Information Management*
*Isenberg School of Management, UMass Amherst*

***Fousseni Chabi-Yo***
*Associate Dean of Research & PhD Programs,*
*Berthiaume Endowed Professor in Business Administration, and*
*Professor of Finance*
*Isenberg School of Management, UMass Amherst*

*Session*: Keynote #1
*Chaired by Anna Nagurney, Eugene M. Isenberg Chair in Integrative Studies*
*Isenberg School of Management, UMass Amherst*

# Friday, November 20th

*9:30am*

## Will AI Supercharge or Supersede Operations Research? OR at an Inflection Point



***Tinglong Dai***
*Bernard T. Ferrari Professor of Business*
*Johns Hopkins Carey Business School*

Generative and agentic AI are rapidly changing how organizations make decisions, bringing a longstanding operations research (OR) question into a new era: how can increasingly powerful intelligence be translated into reliable action at scale?

At the same time, the rise of general-purpose AI raises a more fundamental question for OR itself. Rich Sutton's "Bitter Lesson'" observes that general methods that scale with computation have repeatedly overtaken approaches that rely on specialized human knowledge. As AI systems become more capable, will they begin to absorb functions traditionally performed by purpose-built optimization and OR models? Or will their growing autonomy make operations research more important than ever?

This talk explores that tension across three frontiers. First, generative AI can broaden access to optimization by turning natural language into models, scenarios, and decisions, enabling interactive analysis and continual re-optimization. Second, the value of AI depends on the human and organizational systems in which it operates, including professional norms, reputational concerns, incentives, and moral hazard. Third, as AI becomes increasingly agentic, reliability and safety become a critical constraint. OR can play a distinctive role here by designing the objectives, information structures, verification mechanisms, and fallback policies that govern autonomous decision-making under uncertainty, distribution shift, and rare but consequential events.

A central question, then, is broader than whether AI will make OR models easier to build or solve. It is how the role of operations research itself changes when intelligence becomes abundant but reliable decision-making remains scarce. The talk will conclude by connecting this question to the mission of the new AI in Operations department at Manufacturing & Service Operations Management.

# Friday, November 20th

*Session*: Local and Global Supply Chain Challenges
*Chaired by June Dong, Professor, Marketing & Management*
*College of Business & Entrepreneurship, SUNY Oswego*

*10:30am* *Invited Talk:*

Maximizing Societal Impact in Food Bank Fresh Produce Supply Chains Through Quality, Equity, and Waste Management

***Deniz Besik***
*Assistant Professor of Analytics & Operations*
*Robins School of Business, University of Richmond*

*11:00am* *Invited Talk:*

Ad Valorem Tariffs in Global Supply Chain Networks and Impacts on Labor

***Samira Samadi***
*PhD Candidate in Operations Management*
*Isenberg School of Management, UMass Amherst*

**11:30am - 1:00pm**
**Lunch**
**Alfond Atrium**

*Session*: Keynote #2
*Chaired by Anna Nagurney, Eugene M. Isenberg Chair in Integrative Studies*
*Isenberg School of Management, UMass Amherst*

# Friday, November 20th

*1:00pm*

## Optimization Approaches to Cluster Analysis in Networks



***Sergiy Butenko***
*Professor and Liollio Family Faculty Fellow*
*Wm. Michael Barnes Department of Industrial & Systems Engineering*
*Texas A&M University*

Cluster detection is a central task in network-based data analysis. A natural mathematical idealization of a cluster is a clique—a set of pairwise-adjacent nodes. In many real networks, however, strict clique structure is too restrictive, motivating a broad family of clique relaxations that relax selected clique properties while retaining the essential notion of a cohesive subgraph.

In this talk, we first present a systematic framework for cluster detection based on clique-relaxation models. We then highlight continuous optimization approaches for solving the resulting problems. A wide range of cluster-detection tasks can be formulated as quadratic, cubic, and higher-degree polynomial optimization problems under linear constraints. These continuous formulations provide both analytical bounds and structural insights, as well as practical, scalable algorithms that exploit continuous optimization machinery while preserving the underlying combinatorial structure.

Building on these ideas, we conclude by discussing a new hierarchy of nonconvex continuous reformulations for discrete optimization problems. In contrast to classical hierarchies based on increasingly tight convex relaxations, this approach seeks to progressively eliminate inferior local optima through a sequence of equivalent reformulations. The resulting hierarchy provides a different perspective on the relationship between discrete and continuous optimization: rather than convexifying the feasible landscape, it aims to sharpen the nonconvex landscape while preserving exactness of the original discrete formulation.

# *Friday, November 20th*

*Session*: Innovations in Supply Chain Risk and Resilience
*Chaired by Dana Hassani, PhD Candidate in Operations Management*
*Isenberg School of Management, UMass Amherst*

*2:00pm* *Invited Talk:*

Blockchain for Sustainable Supply Chains

***Sara Saberi***
*Associate Professor of Operations & Industrial Engineering*
*Business School, Worcester Polytechnic Institute*

*2:30pm* *Invited Talk:*

Integrated Crop and Cargo War Risk Insurance: Application to Ukraine

***Ismael M. Pour***
*PhD Candidate in Operations Management*
*Isenberg School of Management, UMass Amherst*

**3:00 - 3:30pm**
**Coffee Break**

*Session*: Panel
*Chaired by Anna Nagurney, Eugene M. Isenberg Chair in Integrative Studies*
*Isenberg School of Management, UMass Amherst*

# Friday, November 20th

*3:30pm* *Panel Discussion:*

Challenges and Opportunities for Industry and Academia and How Networks Can Help

***Jose M. Cruz***
*Associate Professor of Operations & Information Management*
*and former Associate Dean for Graduate Programs*
*University of Connecticut School of Business*

***June Dong***
*Professor, Department of Marketing & Management*
*College of Business & Entrepreneurship, SUNY Oswego*

***Michael Prokle***
*Data Science Architect & Lead*
*Takeda, Cambridge, MA*

***Zihao Qu***
*Assistant Professor, Operations & Information Management*
*Isenberg School of Business, UMass Amherst*

***Senay Solak***
*John F. Smith Memorial Professor and*
*Department Chair of Operations & Information Management*
*Isenberg School of Management, UMass Amherst*

# Saturday, November 21st

**Isenberg School of Management**
**Room 210**

*8:30am* Doors Open

*Coffee provided*

*Session*: Keynote #3
*Chaired by Anna Nagurney, Eugene M. Isenberg Chair in Integrative Studies*
*Isenberg School of Management, UMass Amherst*

# Saturday, November 21st

*9:00am*

## How Does War & Conflict Shape Global Science Networks?

Using large-scale bibliometric data on hundreds of thousands of scientists affiliated with institutions in Ukraine and Russia, this talk examines how war reshapes the global networks of scientific collaboration, funding, and researcher mobility. Tracking nearly 200,000 scientists affiliated with Russian institutions, I show that scientific output fell sharply after Russia's 2022 full-scale invasion of Ukraine, and that the roughly 4% who moved to institutions abroad were disproportionately among the most productive. Those who remained were also increasingly reorienting their international collaborations toward China. A second study examines Ukrainian scientists following Russia's 2014 annexation of Crimea. Scientists in Crimea were rapidly absorbed into Russian research networks, while those elsewhere in Ukraine increasingly decoupled from Russian science. Together, these cases show how war can reconfigure who is connected to whom in global science, and what these disruptions mean for measuring and sustaining scientific networks during conflict.



***Ina Ganguli***
*Joint Professor of Economics and Management*

*Department of Economics and Isenberg School of Management*
*UMass Amherst*

**10:00 - 10:30am**
**Coffee Break**

# Saturday, November 21st

*Session*: Sustainability in Networked Systems and Practice
*Chaired by Ding Zhang, Professor, Marketing & Management*
*College of Business & Entrepreneurship, SUNY Oswego*

*10:30am* *Invited Talk:*

Sustainable Urban Supply Chains:
Crowdsourced Logistics and Parcel Locker Deployment

***Patrizia Daniele***
*Professor of Operations Research*
*Department of Mathematics & Computer Science*
*University of Catania, Italy*

*11:00am* *Invited Talk:*

The Network Effect of Impact

***Stavros Siokos***
*Co-Founder and Managing Partner*
*Astarte Capital Partners*
*London, UK*

*11:30am* Closing Remarks

***Anna Nagurney***
*Eugene M. Isenberg Chair in Integrative Studies and*
*Director of the Virtual Center for Supernetworks*
*Isenberg School of Management, UMass Amherst*

# Keynote Speaker



## Tinglong Dai

*Bernard T. Ferrari*
*Professor of Business*

*Johns Hopkins*
*Carey Business School*

Tinglong Dai is the Bernard T. Ferrari Professor of Business at the Johns Hopkins Carey Business School. He co-chairs the Johns Hopkins Workgroup on AI and Healthcare and co-leads Johns Hopkins' Bloomberg Distinguished Professorship cluster on medical AI. His work focuses on integrating AI into clinical workflows to improve productivity, access, and equity while preserving human judgment, safety, and accountability. A Vice President at INFORMS, he is founding Department Editor for AI in Operations at Manufacturing & Service Operations Management, Associate Editor at Management Science, Senior Editor at Production & Operations Management, and Editor at Large at npj Digital Medicine. He publishes in premier journals across operations, marketing, and medicine and is quoted hundreds of times in outlets including the Associated Press, Bloomberg, CNN, The New York Times, NPR, The Wall Street Journal, and The Washington Post, and has appeared on BBC News, CNBC, and PBS NewsHour. Poets & Quants named him one of the World's Best 40 Under 40 MBA Professors. He earned his PhD from Carnegie Mellon University in 2013.

# Keynote Speaker



## Sergiy Butenko

*Professor and Liollio Family Faculty Fellow*

*Wm. Michael Barnes Department of Industrial & Systems Engineering*
*Texas A&M University*

Sergiy Butenko is a Professor and Liollio Family Faculty Fellow in the Wm. Michael Barnes Department of Industrial and Systems Engineering at Texas A&M University. He serves as Editor-in-Chief of the Journal of Global Optimization. He earned B.S. and M.S. degrees in Mathematics from Taras Shevchenko National University of Kyiv, Ukraine, and M.S. and Ph.D. degrees in Industrial and Systems Engineering from the University of Florida.

Professor Butenko's research spans discrete and global optimization, network analysis and network-based data mining, and graph theory, with applications in biological, social, and financial networks; wireless ad hoc and sensor networks; transportation; and energy systems. His research has been supported by the Air Force Office of Scientific Research, the U.S. Department of Energy, the National Science Foundation, the Office of Naval Research, and NATO.

# Keynote Speaker



## Ina Ganguli

*Joint Professor of Economics and Management*

*Department of Economics and Isenberg School of Management*
*UMass Amherst*

Ina Ganguli is a Professor at the University of Massachusetts Amherst, with a joint appointment in the Department of Economics and the Department of Management in the Isenberg School of Management. Her research areas are labor economics and the economics of science and innovation. She holds a Ph.D. from Harvard University, an M.P.P. from the University of Michigan, and a B.A. from Northwestern University. She was previously the Director of the UMass Computational Social Science Institute, and has served as a Fulbright Scholar in France and Ukraine, and as a U.S. Embassy Policy Specialist Fellow in Russia, Azerbaijan, and Tajikistan. She is a Research Associate at the NBER, a Research Fellow at IZA, an Affiliated Researcher at SITE, and a Faculty Associate at Harvard's Davis Center for Russian and Eurasian Studies.

# Thank You


## Funding

***Anna Nagurney***
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*Isenberg School of Management, UMass Amherst*

***Department of Operations & Information Management***
***Isenberg School of Management, UMass Amherst***

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## Support

***Nancy Billings***
*Associate Director of Special Programs & Engagement*
*Isenberg School of Management, UMass Amherst*

***Nam Nguyen***
*EDP Programmer*
*Information Technology*
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***Shannon Petrin***
*Assistant Dean of Strategic Engagement*
*Isenberg School of Management, UMass Amherst*

***Samantha Whittle***
*Administrative Coordinator*
*Operations & Information Management*
*Isenberg School of Management, UMass Amherst*

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***Isenberg School of Management, UMass Amherst***

***Technology & Support Services Team***
***Isenberg School of Management, UMass Amherst***

# Acknowledgments

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***Stavros Siokos***
*Co-Founder and Managing Partner*
*Astarte Capital Partners*
*London, UK*

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## Session Chairs

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*Isenberg School of Management, UMass Amherst*

***June Dong***
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*College of Business & Entrepreneurship*
*SUNY Oswego*

***Ding Zhang***
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*SUNY Oswego*

***Dana Hassani***
*PhD Candidate in Operations Management*
*Isenberg School of Management, UMass Amherst*

# Acknowledgments

## Opening Remarks

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**Thank you for attending the**
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**Supernetworks Symposium!**

# Center Associates



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