
The Supernetwork Sentinel

The Newsletter of the Virtual Center for Supernetworks

Winter 2005



Happy New Year and welcome to the Winter 2005 edition of **The Supernetwork Sentinel**, the newsletter of the Virtual Center for Supernetworks at the Isenberg School of Management, at the University of Massachusetts at Amherst. **The Supernetwork Sentinel** is published in Fall, Winter, and Summer editions. Its purpose is to keep you informed of events, activities, and successes of the Virtual Center for Supernetworks and the Supernetwork Laboratory for Computation and Visualization. In this newsletter, we include news items, noteworthy recognitions, and information regarding center activities.

Anna Nagurney
John F. Smith Memorial Professor
Director – Virtual Center for Supernetworks

The Supernetworks Laboratory is Refurbished!



This past Fall, the Supernetworks Laboratory for Computation and Visualization was completely refurbished, providing a new level of professionalism for its various activities in support of the Virtual Center for Supernetworks. This past term it hosted several visitors from industry and academia as well as industrial liaison and economic development experts. See: <http://supernet.som.umass.edu/lab.htm> for more information on the lab.

For more photos of and information on the Center see: <http://supernet.som.umass.edu>



Mr. Jack Ampuja, member of the Business Advisory Council of the Isenberg School of Management, visited the Supernetworks Lab on November 17, 2004, after speaking to Professor Nagurney's Transportation & Logistics class on the importance and role of optimization in supply chains. Mr. Ampuja is the Director of the Logistics, Transportation and Management Center at Niagara University and also a partner in the firm, Supply Chain Optimizers. For Mr. Ampuja's presentation, **How Leaders are Leveraging Supply Chain Expertise**, see: <http://supernet.som.umass.edu/visuals.html>

Anna Nagurney has organized a minisymposium entitled: **Projected Dynamical Systems and Evolutionary Variational Inequalities with Applications** for the Eighth SIAM Conference on Optimization to be held in Stockholm, Sweden, in mid-May, 2005. Invited speakers for the minisymposium include: Professor William Sandholm from the University of Wisconsin, Professor Monica Gabriela Cojocaru of the University of Guelph, and Professor Patrizia Daniele of the University of Catania. Both Professors Cojocaru and Daniele serve as International Center Associates.

Inside

**Center for Teaching Grant Awarded
Kudos and Congratulations
Center Associate News
Center Publications
Upcoming Events**

Center for Teaching Grant Awarded

Professor Anna Nagurney has received a grant from the Center for Teaching at the University of Massachusetts at Amherst to support the project, **Web-Based Computation and Visualization Tools for Transportation and Logistics**. She will be working on the project with Center Associate, Leo Zugang. Specifically, they will develop visualization tools based on Java that will display dynamically outputs of algorithms that Professor Nagurney has constructed for the solution of a variety of network optimization and equilibrium problems. The displays will show how the flows in the form of vehicles, commodities, financial payments, etc., evolve over space and time. The web-based tools will ultimately be incorporated into network-based courses that Professor Nagurney instructs at both the undergraduate and graduate levels.

Kudos and Congratulations

Congratulations to the UMASS Amherst INFORMS Student Chapter; see: <http://student.som.umass.edu/informs/> for its selection as a Spotlight Chapter in the publication *ORMS Tomorrow*, the Student Newsletter of INFORMS! Center Associate, Tina Wakolbinger, is the Chapter President, and Center Associate, Zugang "Leo" Liu, is the Chapter's Webmaster. Anna Nagurney serves as the Chapter's Faculty Advisor. The article on the chapter and its activities can be found at: <http://ormstomorrow.informs.org>

The Operations Research / Management Science Seminar Series for Fall 2004 was very successful and hosted seven speakers from UMass-Amherst.



Professor Julie Caswell from the Department of Resource Economics at her seminar, *What is the Most Effective Way to Produce Food Safely*, with Chapter President and Center Associate Tina Wakolbinger and Professor Nagurney.

For the list of speakers and their seminar titles, abstracts, and other info, see:

<http://supernet.som.umass.edu/informs/speakers.html>

The Spring 2005 seminar series will be online soon and will host speakers from UMASS Amherst, Harvard, UCONN, Amherst College, Smith College, as well as Williams College. Congratulations to all the students involved in this important research seminar series and many thanks to all the speakers for their outstanding talks and discussions with the audience participants!

Center Associate News

Center Associates were well-represented at the INFORMS National Meeting in Denver, Colorado, October 24-27, 2004. Anna Nagurney delivered the paper, joint with M.-G. Cojocaru and Patrizia Daniele, **Projected Dynamical Systems and Evolutionary Variational Inequalities with Application to Dynamic Traffic**. Ke Ke presented the paper, joint with Anna Nagurney, entitled: **Financial Networks with Intermediation: Risk Management with Variable Weights**. Fuminori Toyasaki was selected and took part in the doctoral consortium that took place prior to the INFORMS National Meeting.

Anna Nagurney gave a seminar entitled **Supernetworks and Decision-Making in the 21st Century** at the University of Pittsburgh on November 11, 2004, as part of the INFORMS Speakers Bureau program. She also met with students from the Department of Industrial Engineering and the Katz School of Business during her visit.



Anna Nagurney and Tina Wakolbinger delivered a seminar on **Social Networks: New Paradigms for Modeling, Applications, Computations, and Visualization** in the Fall 2004 UMASS Amherst Operations Research /Management Science Seminar Series on November 19, 2004.

Anna Nagurney, Jose M. Cruz, and Tina Wakolbinger presented the paper **The Co-Evolution and Emergence of Integrated International Financial Networks and Social Networks: Theory, Analysis, and Computations** at the First POMS College Conference at Columbia University, December 3-4, 2004 in New York City.



Tina Wakolbinger and Anna Nagurney will present the paper **Dynamic Supernetworks for the Integration of Social Networks and Supply Chains with Electronic Commerce: Modeling and Analysis of Buyer-Seller Relationships with Computations** at the Ninth INFORMS Computing Conference in Annapolis, Maryland, January 5-7, 2005.

Additional conference and workshop information is available at: <http://supernet.som.umass.edu>

Center Publications

Copies of the below (and other) center articles may be found at: <http://supernet.som.umass.edu/dart.html>

A Network Modeling Approach for the Optimization of Internet-Based Advertising Strategies and Pricing with a Quantitative Explanation of Two Paradoxes, Lan Zhao and Anna Nagurney (2004).

A Retrospective on Beckmann, McGuire, and Winsten's Studies in the Economics of Transportation, David E. Boyce, Hani S. Mahmassani, and Anna Nagurney (2004), to appear in *Papers in Regional Science*.

Financial Networks with Intermediation: Risk Management with Variable Weights, Anna Nagurney and Ke Ke (2004), to appear in *European Journal of Operational Research*.

Projected Dynamical Systems and Evolutionary Variational Inequalities via Hilbert Spaces with Applications, Monica Gabriela Cojocaru, Patrizia Daniele, and Anna Nagurney (2004), to appear in *Journal of Optimization Theory and Applications* 2005.

Dynamic Supernetworks for the Integration of Social Networks and Supply Chains with Electronic Commerce: Modeling and Analysis of Buyer-Seller Relationships with Computations, Tina Wakolbinger and Anna Nagurney appears in *Netnomics* **6**, 153-185 (2004).

The Co-Evolution and Emergence of Integrated International Financial Networks and Social Networks: Theory, Analysis, and Computations, Anna Nagurney, Jose M. Cruz, and Tina Wakolbinger (2004), prepared for the volume **Globalization and Regional Economic Modeling**, R. J. Cooper, K. P. Donaghy, and G. J. D. Hewings, Editors, Springer, Berlin, Germany.

Projected Dynamical Systems, Evolutionary Variational Inequalities, Applications, and a Computational Procedure, Monica Gabriela Cojocaru, Patrizia Daniele, and Anna Nagurney (2004), prepared for the volume **Pareto Optimality, Game Theory and Equilibria**, A. Migdalas, P. Pardalos, and L. Pitsoulis, Editors, Kluwer Academic Publishers.

Supernetworks: Paradoxes, Challenges, and New Opportunities, Anna Nagurney, in **Transforming Enterprise**, W. H. Dutton, B. Kahin, R. O'Callaghan, and A. W. Wyckoff, Editors, MIT Press, Cambridge, Massachusetts (2004).

Spatial Equilibration in Transport Networks, Anna Nagurney, in **Handbook of Transport Geography and Spatial Systems**, D. A. Hensher, K. J. Button, K. E. Hayes, and P. R. Stopher, Editors, Elsevier, Amsterdam, The Netherlands (2004), pp. 583-608.

Reverse Supply Chain Management and Electronic Waste Recycling: A Multitiered Network Equilibrium Framework for E-Cycling, Anna Nagurney and Fuminori Toyasaki, *Transportation Research E* **41** (2005), 1-28.

Supply Chain Networks, Electronic Commerce, and Supply Side and Demand Side Risk, Anna Nagurney, Jose M. Cruz, June Dong, and Ding Zhang, *European Journal of Operational Research* **164** (2005), 120-142.

Upcoming Events

Anna Nagurney will present an invited seminar at Northwestern University in February 2005. She will also be traveling in April to New Zealand to give an invited talk at the Workshop on Mathematical Models for Optimizing Transportation Services, to be held at the University of Auckland.

Jose M. Cruz will present the paper **Financial Engineering of the Integration of Global Supply Chain Networks and Social Networks with Risk Management**, co-authored with Anna Nagurney and Tina Wakolbinger, at the 2005 POMS Operations Management Frontiers: Winds of Change Conference, to be held April 29-May 2, in Chicago, Illinois.

Anna Nagurney is on the Advisory Board of the International Conference on Computational Management Science to be held March 31-April 3, 2005 at the University of Florida in Gainesville.

Anna Nagurney is on the Organizing Committee of the 2005 Computing in Economics and Finance Conference to be held in Washington, DC in June 2005 and hosted by the Federal Reserve Board and George Washington University.

Lan Zhao (SUNY - Old Westbury) will present the paper **A Network Modeling Approach for the Optimization of Internet-Based Advertising Strategies and Pricing with a Quantitative Explanation of Two Paradoxes**, co-authored with Anna Nagurney at the 2005 IFORS Conference in Hawaii in July.



**UMass- Amherst INFORMS Student Chapter
Holiday Dessert Party - December 17, 2004**

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John F. Smith Memorial Professor

Associates

Dr. Monica Gabriela Cojocaru
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Dr. Patrizia Daniele
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Dr. Ke Ke
Dr. Ladimer Nagurney
Dr. Padma Ramanujam
Dr. Stavros Siokos
Dr. Ding Zhang

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