
The Supernetwork Sentinel

The Newsletter of the Virtual Center for Supernetworks

Fall 2006



Welcome to the Fall 2006 edition of **The Supernetwork Sentinel**, the newsletter of the Virtual Center for Supernetworks at the Isenberg School of Management, UMass 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, the Center Associates, and the Supernetworks Laboratory for Computation and Visualization. In this newsletter, we include an essay on Professor Anna Nagurney's trip to Shanghai, China, information on the Fall 2006 UMass Amherst INFORMS Speaker Series and the upcoming Exploratory Seminar on Dynamic Networks at the Radcliffe Institute at Harvard University. We also have info on international visitors and a list of our recent publications

Anna Nagurney
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<http://supernet.som.umass.edu>



Professor Anna Nagurney gives Keynote Speech: Supernetworks: Management Science for the 21st Century on August 18, 2006 in Shanghai, China at Fudan University, hosted by the School of Management



Professors June Dong of SUNY Oswego, Daoli Zhu of Fudan University, and Anna Nagurney at the International Management Science Forum in Shanghai, China, August 18-19, 2006 with a Chinese colleague

Professor Nagurney's sabbatical year during which she was based at the Radcliffe Institute for Advanced Study at Harvard University; see <http://www.radcliffe.edu> came to a wonderful end with a trip to Shanghai, China. More information can be found inside in her essay.

Additional presentations this past summer were made at various conferences in Cyprus, Iceland, and Italy. More information inside this newsletter.

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Jury for the 2006 Fudan Premium Fund Prize in Management



Former Chinese Vice-Premier Li Lanqing, benefactor of the Fudan Premier Management Fund, presents a copy of his book, Education for 1.3 Billion, to Professor Nagurny

Trip to Shanghai, China

Anna Nagurny

On August 15, 2006 I flew on United Airlines (business class) to Shanghai, China, via Chicago and arrived on August 17. I was met by Supernetwork Center Associate, Professor June Dong, who had flown in shortly before and once I had my luggage we were ferried by a van service and doctoral student of Professor Daoli Zhu's at Fudan University. I had been invited to present a keynote speech at the Fudan International Forum in Management Science, held August 18-19, 2006 and to also serve on the prize committee for the selection of the award winner(s) of the 2006 Fudan Premium Fund Prize in Management. This year's prize is in Management Science and the jury consisted of 12 members with 3 members being outside of Asia (myself, Professor Charles Colbert of the Graduate School of Management at UCLA and Professor Pierre Benghozi of the Ecole Polytechnique in Paris, France). The prize is the largest award (financially) for distinguished research in Management Science and is to be given to the researcher in China who has made the greatest contributions to theory and practice.

The experience of being in Shanghai, China was simply amazing. Professor June Dong, who is originally from Shanghai, helped to make the visit, along with our hosts from Fudan University and the Premier Fund, incredibly comfortable and fascinating. The organization of my visit was flawless and I got to meet not only the present Mayor of Shanghai but also a former Vice Premier of China. During the two day Management Science Forum, which included simultaneous translations, I gave my speech entitled, "Supernetworks: Management Science for the 21st Century," interacted with other speakers, including Professors Benghozi, Colbert, as well as Professors Mike Pinedo and Eitan Zemel of NYU and Professor Guillermo Gallego of Columbia University, and faculty and administrators from various Chinese (and other) universities.

We were treated like royalty and enjoyed two banquets a day and a visit to the Bund and the Shanghai Museum. Service on the jury for the Fudan Premium Fund Prize in Management was an experience of a lifetime and I even got to meet the chairman of Baosteel, who is female! The evaluation process was thorough and made in an atmosphere of mutual respect and collegiality. The prize winner(s) will be announced late in September 2006 and one of the three finalists is Dr. Daoli Zhu of Fudan University in Shanghai.

On August 20, 2006, Professor Daoli Zhu hosted a workshop on supernetworks in which Professor June Dong and I participated along with a cadre of doctoral students from Fudan and faculty from other Chinese universities. The level of scholarship in supernetwork research in China, combined with applications to emergency planning, global supply chains, and transportation demonstrated the importance of supernetworks in China, in general, and, in Shanghai, which is growing at a furious pace, in particular.

On August 21, I departed from Shanghai, leaving with wonderful memories of hospitality, graciousness, and energy and warmth extended to me by my hosts. The experience was my first visit to China, and I hope that it will not be my last.

Fall 2006 UMass Amherst INFORMS Student Chapter Speaker Series Announced

The speaker lineup for Fall 2006 is outstanding!

The UMASS Amherst INFORMS (Institute for Operations Research and the Management Sciences; <http://www.informs.org>) Student Chapter is delighted and honored to announce the Operations Research/Management Science Fall 2006 Speaker Series. This is the fifth semester of this speaker series, which brings 6-8 speakers to the Isenberg School of Management in each semester. The talks take place on scheduled Fridays at 11AM in the Isenberg School of Management (ISOM), Room 112, and are open to the public

Those interested in attending can view the following link for more information on the speakers and their presentations:

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

The UMASS INFORMS Fall 2006 Seminar Series in Operations Research/Management Science consists of 6 speakers: Dr. Robin Lougee-Heimer of IBM Thomas J. Watson Research Center, Professor William Hogan, The Raymond Plank Professor of Global Energy Policy at the Kennedy School of Government at Harvard University, Professor Cynthia Barnhart of the Department of Civil and Environmental Engineering and the Engineering Systems Division at MIT, Professor Andrew McCallum of the Department of Computer Science at UMass Amherst, Dr. Les Servi of Lincoln Labs at MIT, and Professor Nathaniel Whitaker of the Department of Mathematics and Statistics.

Dr. Lougee-Heimer is an expert in the use of analytics to provide solutions to challenging business problems and is the co-creator of the Computational Infrastructure for Operations Research. She will present the talk, "Advanced Applications of Operations Research at IBM" on September 29, 2006.

Professor Hogan is the Research Director of the Harvard Electricity Policy Group and is the Director of the Energy Environmental Policy Center at Harvard. His talk will be presented on October 13, 2006.

Professor Barnhart is an expert on optimization approaches to airline industry problems and was awarded the Franz Edelman Prize for Achievement in Operations Research and the Management Sciences. Her presentation, "Optimization Approaches to Airline Industry Challenges," will be given on October 27, 2006.

Professor McCallum's expertise is in statistical machine learning applied to information

extraction and document classification and was previously a Vice President of Research Development at WhizBang Labs. His presentation, "Bayesian Models of Social Networks and Texts," which will also discuss an application to the Enron investigation, will be given on November 3, 2006.

Dr. Servi, who has also worked at Bell Laboratories and at GTE, is the holder of 7 patents and was awarded in 1999 GTE's highest technical award. He is an expert on performance analysis of telecommunications systems and since 2000 has been at Lincoln Labs in the Advanced Networks and Applications group. He is a recently elected INFORMS Fellow and has been appointed the editor of the journal *Management Science*. Dr. Servi will be speaking in ISOM on November 17, 2006.

Professor Whitaker develops numerical methods for solving differential equations, especially those which result from fluid mechanics. Professor Whitaker received the 2005-2006 Distinguished Outreach Award from UMass Amherst for establishing a Saturday math program for African-American students which evolved into a program to boost math skills and self-confidence of African-American students in the Amherst-Pelham public schools. He will give his talk, "Some Mathematical Models in Medicine" on December 1, 2006.

Support for the speaker series is provided by the Isenberg School of Management, the Department of Finance and Operations Management, the John F. Smith Memorial Fund, and INFORMS. Anna Nagurney, the John F. Smith Memorial Professor at the Isenberg School of Management, serves as the Faculty Advisor to the Chapter and the Speaker Series.

The UMass Amherst Speaker Series Coordinator for 2006-2007 is Doctoral Student Center Associate Trisha Woolley. The Faculty Advisor is Center Director, Professor Anna Nagurney.

The various activities of the student chapter, including presentations of seminar speakers and photos, can be found on the chapter's website: <http://student.som.umass.edu/informs/>

Radcliffe Exploratory Seminar on Dynamic Networks: Behavior, Optimization and Design

Professor David Parkes, the John L. Loeb Associate Professor of Natural Sciences and Associate Professor of Computer Science in the Division of Engineering and Applied Sciences at Harvard University and Center Director, Professor Anna Nagurney, have received funding from the Radcliffe Institute for Advanced Study

at Harvard to host a Radcliffe Exploratory Seminar on Dynamic Networks: Behavior, Optimization, and Design at the Radcliffe Institute in Cambridge, Massachusetts.

This event will take place October 20-21, 2006, and will bring together a group of researchers from different disciplines to discuss and relate different theories and methodologies for the understanding and optimizing via design the behavior of dynamic networks. Invited and confirmed speakers are: Professors Mark Newman of the University of Michigan, Michael Mitzenmacher of Harvard, John Byers of Boston University, David Alderson of the Naval Postgraduate School, Panos Pardalos of the University of Florida, Lada Adamic of the University of Michigan, Patrick Wolfe of Harvard, David Levinson of the University of Minnesota, William Sandholm of the University of Wisconsin, Asu Ozdaglar of MIT, and Joan Feigenbaum of Yale. Professors. Professors David Parkes and Anna Nagurney will also be giving presentations. Doctoral students from Harvard and the University of Massachusetts at Amherst will be participating in the discussions.

Additional information can be found at: <http://www.eccs.harvard.edu/~parkes/RadcliffeSeminar.htm>

Welcome to New Doctoral Student Center Associate Emmanuel Agyei

Mr. Emmanuel Agyei has matriculated into the doctoral program at the Isenberg School of Management with a concentration in Management Science and is working in the Supernetworks Laboratory of the Virtual Center for Supernetworks. Mr. Agyei is from Ghana and has done research on transportation, tolls, and the environment.

Kudos, Congratulations, and News

Congratulations to Student Center Associate Zugang Liu, who has been selected to participate in the Future Academicians Colloquium preceding the INFORMS National Meeting, which will take place in Pittsburgh, PA in November 2006.

Kudos to Dr. Dmytro Matsypura who successfully defended his doctoral dissertation on August 28, 2006. Professor Nagurney was the chair of his dissertation committee and Professors Iqbal Agha, Robert Moll, and Ana Muriel from UMass Amherst completed his dissertation committee. Dr. Matsypura has accepted an academic appointment at the University of Sydney in Australia. Dr. Matsypura's dissertation title was: "Dynamics of

Global Supply Chain and Electric Power Networks: Models, Pricing Analysis, and Computations. His dissertation abstract can be found at: <http://supernet.som.umass.edu>



Dr. Dmytro Matsypura with his wife, Center Associate Dr. Jose Cruz, Student Associates Patrick Qiang and Trisha Woolley

Congratulations to Center Associate, Dr. Ding Zhang, who has been appointed MBA Director at the School of Business at SUNY at Oswego.

On September 19, 2006, Professor Nagurney gave a Distinguished Seminar at Columbia University in New York City as part of its joint Decision, Risk, and Operations and Industrial Engineering and Operations Research Series. The title of her seminar was: "Dynamic Networks: Recent Results and Applications." Her host was Professor Soulaymaine Kachani. Her presentation is available at: <http://supernet.som.umass.edu/visuals.html>

International Visitors to the Center

September 26 and 27, 2006, Professor Werner Rothengatter of the University of Karlsruhe, Germany, and an expert on transportation, infrastructure, project management, and risk management will be part of a delegation from Germany visiting the University of Massachusetts system. The delegation is part of an S&T project funded by President Jack Wilson's office. During this period, Professor Rothengatter will be meeting with Professor Nagurney and the doctoral student center associates and will also be engaged in various UMass organized activities.

November 29 and 30, Dr. Stavros Siokos, Managing Director of Citigroup in London, and Center Associate, will be visiting the Isenberg School of Management and will also present a seminar on the morning of November 30. For further information, please regularly check: <http://supernet.som.umass.edu>

International Conferences

Center Associates were very busy this summer presenting papers at international conferences. The paper, "Optimal Endogenous Carbon Taxes for Electric Power Supply Chains with Power Plants," Anna Nagurney, Zugang Liu, and Trisha Woolley was presented at the Computing in Economics and Finance (CEF) Conference, Limassol, Cyprus, June 22-24, 2006. The paper, "Equilibria, Supernetworks, and Evolutionary Variational Inequalities," Anna Nagurney and Zugang Liu was also presented at this conference.



Professor Nagurney with Professors Tapiero, Rustem, Amman, Kendrick, and Wieland at the CEF Conference in Cyprus

In addition, collaborator Professor Lan Zhao of SUNY at Old Westbury presented the paper, "A Network Equilibrium Framework for Internet Advertising: Models, Qualitative Analysis, and Algorithms," joint with Anna Nagurney, at the IFORS Conference in Hong Kong, June 25-28, 2006.



Professor Nagurney with friends in Iceland

The paper, "Static and Dynamic Transportation Network Equilibrium Reformulations of Electric Power Supply Chain Networks with Known Demands," Anna Nagurney, Zugang Liu, Monica-

Gabriela Cojocar, and Patrizia Daniele was presented at the 21st European Conference on Operations Research in Reykjavik, Iceland, July 2-5, 2006.

Anna Nagurney presented the invited talk, "Equilibria, Supernetworks, and Evolutionary Variational Inequalities" at the 44th Workshop on Variational Analysis and Partial Differential Equations, held in Erice, Sicily, July 5-14, 2006. Also presenting at the workshop were Center Associates: Professors Patrizia Daniele and Monica-Gabriela Cojocar. Special thanks to Professor Maugeri of the University of Catania in Italy for doing such an outstanding job organizing this workshop.



Center Associates Monica-Gabriela Cojocar and Patrizia Daniele with Professor Giannessi and friends/spouses in Erice, Sicily at the workshop organized by Professor Maugeri

For visuals of these and other presentations, see: <http://supernet.som.umass.edu/visuals.html>

Center Associate, Professor Ladimer Nagurney presented an invited talk, "Cell Site Design to Introduce Students to a Broad Range of Issues Regarding Design", as part of the 2006 Educators' Workshop at the National Center for Telecommunications Technologies (NCTT), in Springfield, MA, on July 11, 2006.

For some photos from the above conferences, see:

<http://supernet.som.umass.edu/cfoto/centerphotos.html>

Center Publications

Copies of these (and other) center articles may be found at:

<http://supernet.som.umass.edu/dart.html>

The Internet, Evolutionary Variational Inequalities, and the Time-Dependent Braess Paradox, A. Nagurney, D. Parkes, and

P. Daniele, *Computational Management Science* (2006), in press.

Financial Engineering of the Integration of Global Supply Chain Networks and Social Networks with Risk Management, J. Cruz, A. Nagurney, and T. Wakolbinger, *Naval Research Logistics* (2006) **53**, 674-696.

Optimal Endogenous Carbon Taxes for Electric Power Supply Chains with Power Plants, A. Nagurney, Z. Liu, and T. Woolley, *Mathematical and Computer Modelling* (2006), **44**, 899-916.

The Evolution and Emergence of Integrated Social and Financial Networks with Electronic Transactions: A Dynamic Supernetwork Theory for the Modeling, Analysis, and Computation of Financial Flows and Relationship Levels, A. Nagurney, T. Wakolbinger, and L. Zhao, *Computational Economics* (2006), **27**, 353-393

On the Relationship Between Supply Chain and Transportation Network Equilibria: A Supernetwork Equivalence with Computations, A. Nagurney, *Transportation Research E* (2006), **42**, 293-316.

Modeling Generator Power Plant Portfolios and Pollution Taxes in Electric Power Supply Chain Networks: A Transportation Network Equilibrium Transformation, K. Wu, A. Nagurney, Z. Liu, and J. Stranlund, *Transportation Research D* (2006), **11**, 171-190.

A Network Modeling Approach for the Optimization of Internet-Based Advertising Strategies and Pricing with a Quantitative Explanation of Two Paradoxes, L. Zhao and A. Nagurney (2004), to appear in *Netnomics*.

Double-Layered Dynamics: A Unified Theory of Projected Dynamical Systems and Evolutionary Variational Inequalities, M.-J. Cojocar, P. Daniele, and A. Nagurney (2004), *European Journal of Operational Research*, in press.

Dynamic Electric Power Supply Chains and Transportation Networks: An Evolutionary Variational Inequality Formulation, A. Nagurney, Z. Liu, M.-G. Cojocar, and P. Daniele (2005), to appear in *Transportation Research E*.

Financial Networks with Intermediation and Transportation Network Equilibria: A Supernetwork Equivalence and Reinterpretation of the Equilibrium Conditions with Computations, Z. Liu and A. Nagurney, *Computational Management Science* (2006), in press.

Modeling of Electric Power Supply Chain Networks with Fuel Suppliers via

Variational Inequalities, D. Matsypura, A. Nagurney, and Z. Liu, submitted (2006).

Sustainable Supply Chain Networks and Transportation, A. Nagurney, Z. Liu, and T. Woolley (2006), prepared for *International Journal of Sustainable Transportation*.



Anna Nagurney's new book, **Supply Chain Network Economics: Dynamics of Prices, Flows, and Profits**, was published by Edward Elgar Publishing in the **New Dimensions in Networks** series in July 2006.



Center Associate Patrizia Daniele's new book **Dynamic Networks and Evolutionary Variational Inequalities** was also published over the summer in the **New Dimensions in Networks** series by Edward Elgar Publishing. For more information about books in this series, see:

<http://supernet.som.umass.edu/newdimne.html>

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