



News Release

New Book by UMass Amherst Researchers Explores Network Vulnerabilities and Synergies

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AMHERST, Mass. – The Virtual Center for Supernetworks at the University of Massachusetts Amherst's Isenberg School of Management announces the publication of a new book, *Fragile Networks: Identifying Vulnerabilities and Synergies in an Uncertain World* (Wiley). The authors are Anna Nagurney, the center director and John F. Smith Memorial Professor, and Qiang (Patrick) Qiang, a UMass Amherst alumnus who is now a professor at Pennsylvania State University's Great Valley campus. He is a faculty associate at the UMass center. The book applies computer-based network systems modeling and analysis to vulnerabilities and synergies in congested urban transportation networks, supply chain networks, electric power networks, financial networks, the Internet and other critical networks. It also depicts and quantifies potential synergies associated with mergers and acquisitions in the corporate world and partnership synergies in humanitarian logistics operations.

As the United States begins to rebuild and renew its critical infrastructure, *Fragile Networks* will prove useful to policymakers, urban planners, business strategists and others. The book's multidimensional metrics and criteria (including environmental ones) can help identify where investments will yield the greatest pay-offs to society. At the same time, the book's tools can help identify vulnerable network components that present security risks.

Through its mathematical, multivariate approach, *Fragile Networks* explores a host of network activities, including the behavior of network users, demands for resources, resulting flows and associated costs. Following an introduction to the fundamental methodologies and tools required for network analysis and network vulnerability, the book explores its subject through three sections:

I – Network Fundamentals, Efficiency Measurement and Vulnerability Analysis

II – Applications and Extensions

III – Mergers and Acquisitions, Network Integration and Synergies.

Fragile Networks is the 11th book by Anna Nagurney, whose research focuses on networks and decision making.

