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Professional Interests

Creation of novel and innovative solution methods using Industrial and Systems Engineering principles to study logistical problems of significant societal and business impact.

Education

Doctor of Philosophy in Operations Research (1984)

> Department of Electrical Engineering and Computer Science

> Massachusetts Institute of Technology, Cambridge, Massachusetts

Bachelor of Technology in Mechanical Engineering (1980)

> Department of Mechanical Engineering

> Indian Institute of Technology, New Delhi, India

Academic and Administrative Experience

Department of Industrial and Systems Engineering
       SUNY Distinguished Professor: 2013-
       Professor: 1994-2013
       Associate Professor: 1990-1994
       Assistant Professor: 1984-90
       Director of Graduate Studies: 2003-2005
       Chair: 1994-2003
       Interim Chair: 1992-1994
School of Engineering and Applied Sciences
       Associate Dean for Faculty Affairs, Human Resources and Diversity: 2017-
       Associate Dean for Faculty Affairs and Diversity: 2016-2017
       Associate Dean for Faculty Affairs: 2014-2016
       Associate Dean for Research and Graduate Education: 2013-2014
       Acting/Interim Dean: April 2011-December 2012
       Associate Dean for Graduate Education: 2006-2011

Research Awards

1. Award for Technical Innovation in Industrial Engineering, Institute of Industrial and Systems Engineers, 2016

As stated on the IISE website, this award honors a single innovative technical contribution to the industrial engineering profession that may be recognized in any of several forms, including theory, design, application, implementation and leadership, to name a few.

2. Best paper award for the journal *IIE Transactions: Design and Manufacturing*, 2013, for the paper: M. Zhang, R. Batta and R. Nagi, "Designing Manufacturing Facility Layouts to Mitigate Congestion," Vol. 45, No. 4, (2011), pp. 132-145.

Each year the journal editor selects the best paper published in *IIE Transactions: Design and Manufacturing*.

3. AIIMS-MOPTA Optimization Modeling Competition Winner, Lehigh University, 2012.

The yearly AIMMS/MOPTA Optimization Modeling Competition attracts entries from around the world. The challenge problem for 2012 related to scheduling smart grids. Gina Galindo, Ruben Yie (both doctoral students) and Rajan Batta (faculty) were the winners.

4. Dr. David F. Baker Distinguished Research Award, Institute of Industrial Engineers, 2008

As stated on the IIE website, this award recognizes outstanding research in the profession. This award is for a career of accomplishments that broadly benefited practitioners, organizations, or other researchers rather than for a single activity or application.

5. SUNY Research Foundation Award for Research and Scholarship, 2007

The Research and Scholarship Award is the highest honor the Research Foundation can bestow on SUNY faculty for their outstanding scholarly and research contributions.

6. Best paper award from the journal *Military Operations Research*, 2004, for the paper: S. Mishra, R. Batta and R. J. Szczerba, "A Rule-Based Approach for Aircraft Dispatching to Emerging Targets," *Military Operations Research*, 9,3, (2004), 17-30.

Each year the journal editor selects the best paper published in *Military Operations Research*.

7. Sustained Achievement Award, Exceptional Scholar Program, University at Buffalo, 2002

According to the UB website, the Exceptional Scholar Award for Sustained Achievement recognizes an unprecedented accomplishment in a senior scholar's career.

Teaching Awards

1. Albert G. Holzman Distinguished Educator Award, Institute of Industrial Engineers, 2015

As stated on the IIE website, this award is for significant contributions to the industrial engineering profession by an outstanding educator.

2. University at Buffalo Excellence in Graduate Student Mentoring Award, 2014-2015

As per the UB graduate school website, this award reward recognizes truly outstanding and sustained support and development of graduate students from course completion through research and subsequent career placement

3. SUNY Chancellor's Award for Excellence in Teaching, 2007

This is the highest teaching award available from the State University of New York system

Leadership Awards

1. Eminent Engineer Designation, Tau Beta Pi, The Engineering Honor Society, 2008

2. Fellow, Institute of Industrial Engineers, 2006

3. Faculty in Leadership Fellow, Office of the Provost, University at Buffalo, 2005-06

4. Meritorious Service Award, _Operations Research_, 1996

Student Awards

1. Merit Scholarships for all five years of study (1975-80), Indian Institute of Technology, Delhi, India

2. Junior and Senior Science Talent Awards, 1972 and 1974, Government of India

News Articles on Research

Airport Security Applications

My research on the impact of queue length on the integrity of an airport security system is discussed at the following website:

http://www.msnbc.msn.com/id/21569234/

Military Applications

"UB Software to Give U.S. Military a Clearer Picture of 'Theater of War'," Read more.

"Understanding Battlefield Realities: Software Allows the Military to Track and Predict Movements," Industrial Engineering, March 2004.

"New Software Helps Lift 'Fog and War'," Read more.

Crime Modeling Applications

"Mathematical Model Joins War on Drugs," OR/MS Today, October 1992, Vol. 19, No. 5.

"Industrial Engineers Develop Model for War on Drugs," Industrial Engineering, September 1992, Vol. 24, No. 4.

"War on Drugs gets Help from Unlikely Source: Math Model Predicts Success," Crime Control Digest, June 22, 1992, Vol. 26, No. 25.

"The Police Department in Buffalo gets Some Ideas About how to Make its Drug-Enforcement Efforts More Efficient," The Chronicle of Higher Education, July 8, 1992, Vol. 38, No. 44.

"Researchers Eye Formula for War on Drug Business," The Buffalo News, June 22, 1992.

"Fighting Drugs with Mathematics," UB Today, Fall 1992.

"Drug War: Researchers Say Common Manufacturing Strategy Could Help," Narcotics Control Digest, September 15, 1993, Vol. 23, No. 19.

Discussion on CBS Radio, Seattle, Washington. "Waging an Optimal War on Drugs," OR/MS Today, October 1993, Vol. 20, No. 5.

Journal Editorial Board Service

1. Departmental Editor, *IIE Transactions* (2001-present)

2. Editorial Advisory Board, *Computers and Operations Research* (1997-present)

3. Editorial Advisory Board, *Journal of Enterprise Transformation* (2010-present)

4. Editorial Advisory Board, *Socio-Economic Planning Sciences* (2010-present)

Professional Service

Service to Institute of Industrial and Systems Engineers (IISE)

Senior Vice-President for Publications, Board of Trustees (April 1, 2008 to March 31, 2011): Task was to manage the publications delivered by IISE. This included strategic planning of publication stream to match the objectives of IIE and participation in other board activities and functions. Helped IIE launch three brand new journals: *IIE Transactions on Healthcare Systems Engineering*; *IIE Transactions on Occupational Ergonomics and Human Factors*; *Journal of Enterprise Transformation*.

Chair for IERC for 2006 conference: Tasks included creation of conference committee, solicitation of a plenary speaker (a first for IERC), solicitation of tutorials, working with committee members to organize invited sessions, coordination with the Solutions conference for overlap day activities, selection of contributed talks among those submitted, assistance in publicity about the conference, reporting to CIEADH regarding conference status, and coordination of review process and creation of the conference proceedings.

Departmental Editor for IIE Transactions (Scheduling & Logistics): Handle about 6 papers a year for the journal. Handling a paper involves assignment of an appropriate Associate Editor and subsequent coordination of the refereeing process. On completion of the refereeing process and receipt of the AEs recommendation a decision is made on how to proceed (accept, revise, reject).

ABET Evaluator: Have served as an evaluator on several occasions and have received evaluator training on two separate occasions. Tasks included review of the self-study documents, a visit onsite for 3 days, coordination with other team members on school-wide issues, and submission of an evaluation to the team chair.

ABET Engineering Accreditation Commission Member: Am currently serving on the EAC Board. Anticipated duties include serving as a team chair for ABET EAC visits.

Service to Institute for Operations Research and the Management Sciences (INFORMS)

Served as President for ACORD, Association of Operations Research Related Department Heads. In this role coordinated the meeting of department heads at the INFORMS conference and created action items relative to helping the society in student recruitment and membership growth in general.

Served as a Chair of the FORA committee. In this role helped create two special interest groups that have since become very active in the society. These are the Junior Faculty Interest Group that serves as a conduit to encourage junior faculty to join and subsequently succeed in the profession, and the Women Interest Group that serves as a similar role for women.

Co-chair for tutorials, INFORMS Annual Conference, Houston 2017. In this role helped solicit tutorials for the conference, which included handling chapters (that needed to be reviewed) from authors.

Member of Scientific Committee, TSL Conference, Chicago 2017. In this role helped review submissions for the conference and also helped promote the conference among colleagues.

Service at University of Buffalo (SUNY)

Associate Dean for Faculty Affairs, Human Resources and Diversity—July 2017 to present

Assist and serve as counsel to the dean in matters related to the faculty. These include faculty tenure and promotion cases, faculty recruitment, faculty awards, and junior faculty mentoring initiatives. Assist in human resource issues related to appointments in the Dean's office. Also assist the dean in matters that relate to diversity in faculty, students and staff.

Associate Dean for Faculty Affairs and Diversity—July 2016 to June 2017

Assist and serve as counsel to the dean in matters related to the faculty. These include faculty tenure and promotion cases, faculty recruitment, faculty awards, and junior faculty mentoring initiatives. Also assist the dean in matters that relate to diversity in faculty, students and staff.

Associate Dean for Faculty Affairs—July 2014 to June 2016

Assist and serve as counsel to the dean in matters related to the faculty. These include faculty tenure and promotion cases, faculty recruitment, faculty awards, and junior faculty mentoring initiatives.

Acting/Interim Dean—April 2011 to December 2012

Development and Execution of Strategic Plans:
Worked with department chairs to help develop and craft a 3-year unit plan, aimed at a significant expansion of our school (35% growth anticipated in faculty and staff over the next 5 year period). This 3-year plan for the school is tied with 3 year plans developed by each of the departments, and is also linked with the metrics and plan set forth by the UB Provost Office and follows the guiding principles of NYSUNY2020.

Education and Outreach:
Worked with the College of Arts and Sciences towards a successful 3 E proposal, that led to an initiative to create a new graduate program (MS and PhD) in the area of Materials Science and Engineering. This initiative will hire six additional faculty members across the two schools and foster a new inter-disciplinary graduate program in Materials Science and Engineering.
On the international front, the nominee successfully renewed our 5-year MOU for the Dual Degree Program with Istanbul Technical University in the area of Civil Engineering. The nominee visited several international universities in an attempt to foster collaborations.

Associate Dean for Graduate Studies—January 2006 through April 2011, and January 2013-June 2014(with Research responsibilities added)

Several new initiatives were established in this role. These included: (i) welcoming activities for graduate students to ensure a smooth transition to UB Engineering; (ii) three sets of surveys for graduate students to monitor student intent, progress and satisfaction level; (iii) a career fair specifically for graduate students; (iv) a student ambassador program for fielding questions from prospective students; (v) a poster competition; (vi) a workshop for students interested in being faculty members; and (vii) development of an electronic review system for graduate student applications.

Faculty in Leadership Fellow for the 2005-06 academic year

Work was with the Vice Provost for Faculty Affairs and focused on various activities in managing university faculty, including tenure and promotion, and mentoring. Helped create a new workshop for department chairs for issues related to managing their faculty effectively and in being effective leaders

Department Chair for Industrial and Systems Engineering for 11 years (2 years as interim)

During this period, the department transformed itself from being a major generator of UG degrees to being a major generator of MS, MEng and PhD degrees. Research funding substantially increased during this period. A major success was mentoring junior faculty and creation of new leadership in the department.

RESEARCH PHILOSOPHY

My research philosophy is that of being problem motivated—that is, given a relevant, interesting, real-world application, develop and analyze mathematical models for the related problem. Of particular interest is the creation of novel, innovative application areas for Operations Research techniques. My solid Engineering background coupled with an excellent, in-depth knowledge of a broad range of Operations Research techniques give me the tools that are necessary for effectively performing this type of research activity.

Recent Research Summary

I work in the following research areas:

Pothole Repair

Pothole repair is a significant problem after the winter season. This research is concerned with scheduling of pothole repairs in a way that minimizes the impacts of safety hazards and flow disruption to the impacted public, while maintain equity in the inconvenience caused. A PhD student, Fatemeh Arabi, is working in this area, co-supervised with Jamie Kang.

Hazardous Materials Routing/Logistics

Recent work on hazardous materials routing was supported by the National Science Foundation and by Erie County. Two doctoral students (Masoumeh Talsimi and Tolou Esfandeh) have recently completed doctoral dissertations in this area, co-supervised with Changhyun Kwon. An MS student, Harshavardhan Vemupati, just finished working in this area, co-supervised with Joy Bhadury. Have a visiting student from France, Melanie Braga Tavares, who is currently working in this area.

Routing/Scheduling for Search Missions

Recent work in the area of routing/scheduling for search missions was supported by two grants from the Office of Naval Research. One of the recently graduated doctoral students (Mike Moskal) worked in the area of routing for search over micro-grids, which includes elements of prize collection and movement planning between micro-grids. The other doctoral student, Yan Xia, who recently graduated, explored the value of the price of anarchy in decentralized Markov decision processes, when reward has uncertainties associated with it. Yan's work was co-supervised with Rakesh Nagi.

Convoy and Tugboat Routing

A doctoral student (Azar Sadeghnejad) is working in this area, co-supervised by Moises Sudit. The general problem is that of routing convoys (long sets of vehicles that move together) in both peacetime and war time settings. A key feature is the separation in time and space of the convoys. Her current work relates to tugboat scheduling in a harbor.

School Bus Routing

Several elements of school bus routing were explored, including overbooking of buses, special education bus routing, and studying the impact of pickup restrictions and policies. This work was initially supported by the Williamsville School District. A doctoral student (Hernan Caceres) recently completed his doctoral dissertation in this area, co-supervised with Qing He.

Gasoline Supply Logistics

Two aspects were explored. The first relates to supply of gasoline after a natural disaster has occurred. This is supported by the University Transportation Research Center in CUNY. A doctoral student, Xiaoping Li, is working on this topic, co-supervised with Changhyun Kwon. The other aspect relates to regular gasoline supply. A doctoral student, Yan Cheng-Hsu, worked in this area and recently graduated, co-supervised with Jose Walteros.

Electric Vehicle Routing and Location of Charging Stations

The problem of modeling charging station capacity when considering routing of electric vehicles and location of charging stations is being explored. A doctoral student, Nan Ding, worked in this area and recently graduated, co-supervised with Changhyun Kwon.

Evacuation Planning

This research focuses on efficient management of the evacuation process, which include reaching appropriate evacuation targets by zones, managing traffic congestion in the impacted area, and maintaining equity of access for elderly and physically challenged individuals. Recent work is with a recently graduated MS student (Rahul Swamy) and a visiting PhD student (Sarah Dian), both co-supervised with Jamie Kang.

Disaster Relief Supply in a Mountainous Area

This research focuses on providing relief supplies to an impacted area after a natural disaster. The area being modeled is in mountainous territory and requires supply delivery using porters who travel on trails, in conjunction with helicopters who deliver supplies to porters at strategic supply points. Recent work is with a recently graduated MS student, Abhinav Khare, co-supervised with Jamie Kang.

Grocery Store Layout Optimization

This research focuses on optimization of a grocery store layout, with the aim of maximizing impulse item sales, while keeping customer inconvenience under control. Various aspects of the problem are being studied. Recent work is with a doctoral student, Jessica Dorismond, co-supervised with Jose Walteros.

Overall Statistics for Published (or Accepted) Journal Papers

Total count = 137

Accident Analysis and Prevention: 2

Annals of Operations Research: 7

Computers and Industrial Engineering: 2

Computers and Operations Research: 18

Decision Sciences: 1

European Journal of Operational Research: 20

Geographical Analysis: 2

Human Factors and Ergonomics in Manufacturing: 1

IIE Transactions: 5

Information Systems and Operational Research: 1

Interfaces: 2

International Journal of Mathematics of Operations Research: 1

International Journal of Operational Research: 3

International Journal of Production Research: 4

Journal of Defense Modeling and Simulation: 1

Journal of Geographical Systems: 1

Journal of Simulation: 2

Journal of the Operational Research Society: 3

Journal of Transportation Security: 2

Management Science: 3

Military Operations Research: 4

Naval Research Logistics: 2

Networks: 4

Networks and Spatial Economics: 2

Operations Research: 8

OR Insight: 4

OR Letters: 1

Risk Analysis: 1

SIAM Journal on Applied Mathematics: 1

Socio-Economic Planning Sciences: 10

Theoretical Issues in Ergonomics Science: 1

TOP: An Official Journal of the Spanish Society of Statistics and Operations Research: 1

Transport Policy: 1

Transportation Research B: 1

Transportation Research C: 3

Transportation Research Record: 1

Transportation Science: 11

Submitted Journal Papers

M. Moskal and R. Batta, "Simultaneously Determining Ingress/Egress Points and Time Allocations for UAV Grid Routing," second revision under preparation for *Military Operations Research*. UAV ROUTING

N. Ding, R. Batta and C. Kwon, "Locating Depots to Facilitate Routing a Mixed Fleet of Electric and Conventional Vehicles," submitted to *TOP: An Official Journal of the Spanish Society of Statistics and Operations Research*. ELECTRIC VEHICLE ROUTING

H. Cacares, R. Batta and Q. He, "Special Need Students School Bus Routing: Consideration for Mixed Load and Heterogeneous Fleet," submitted to *Socio-Economic Planning Sciences*. SCHOOL BUS ROUTING

M. Taslimi, R. Batta and C. Kwon, "Medical Waste Collection Considering Transportation and Storage Risk," first revision under preparation for *Computers & Operations Research*. HAZMAT ROUTING

JOURNAL PUBLICATIONS

In Publication Queue:

R. Swamy, J. E. Kang, R. Batta and Y. Chung, "Hurricane Evacuation Planning using Public Transportation," to appear in *Socio-Economic Planning Sciences*. HUMANITARIAN LOGISTICS

H. Caceres, R. Batta and Q. He, "School Bus Routing with Stochastic Demand and Duration Constraints," to appear in *Transportation Science*. SCHOOL BUS ROUTING

T. Esfandeh, R. Batta and C. Kwon, "Time Dependent Hazardous Network Design Problem," to appear in *Transportation Science*. HAZMAT ROUTING

R. Auad and R. Batta, "Location-Coverage Models for Preventing Attacks to Interurban Transportation Networks," to appear in *Annals of Operations Research*. HOMELAND SECURITY APPLICATION

2017

Y. Xia, R. Batta and R. Nagi, "Routing a fleet of vehicles for decentralized reconnaissance with shared workload among regions with uncertain information," *Operations Research*, Vol. 65, No. 3, (2017), pp. 674-692. UAV ROUTING

X. Li, R. Batta and C. Kwon, "Effective and Equitable Supply of Gasoline to Impacted Areas in the Aftermath of a Natural Disaster," *Socio-Economic Planning Sciences*, Vol. 57, (2017), pp. 25-34. HUMANITARIAN LOGISTICS

A. Sadeghnejad-Barkousaraie, R. Batta and M. Sudit, "Convoy Movement Problem: A Civilian Perspective," *Journal of the Operational Research Society*, Vol. 68, No. 1, (2017), pp. 14-33. MILITARY OR

M. Taslimi, R. Batta and C. Kwon, "A Comprehensive Modeling Framework for Hazmat Network Design, Hazmat Response Team Location, and Equity of Risk," *Computers & Operations Research*, Vol. 79, (2017), pp. 119-130. HAZMAT ROUTING

2016

T. Geetla, R. Batta, A. Blatt, M. Flanigan and K. Majka, "Clustering Intelligent Transportation Sensors using Public Transportation," *TOP: An Official Journal of the Spanish Society of Statistics and Operations Research*, Vol. 24, No. 3, (2016), pp. 594-611. INTELLIGENT TRANSPORTATION SYSTEMS

D. Myers, R. Batta and M. Karwan, "A Real-Time Network Approach for Including Obstacles and Flight Dynamics in UAV Route Planning," *Journal of Defense Modeling and Simulation*, Vol. 13, No. 3, (2016), pp. 291-306. UAV ROUTING

M. Kim, R. Batta and Q. He, "Optimal Routing of Infiltration Operations," *Journal of Transportation Security*, Vol. 9, (2016), pp. 87-104. MILITARY APPLICATION

T. Esfandeh, C. Kwon and R. Batta, "Regulating Hazardous Materials Transportation by Dual Toll Pricing," *Transportation Research Part B.*, Vol. 83, (2016), 20-35. HAZMAT ROUTING

G. Galindo and R. Batta, "Forecast-Driven Model for Prepositioning Supplies in Preparation for a Foreseen Hurricane," *Journal of the Operational Research Society*, Vol. 67, No. 1, (2016), pp. 98-113. HUMANITARIAN LOGISTICS

2015

S. Huang, Q. Wang, R. Batta and R. Nagi, "An Integrated Model for Site Selection and Space Determination of Distribution Centers," *Computers and Operations Research*, Vol. 62, (2015), pp. 169-176. WAREHOUSE LOCATION

M. Henchey, R. Batta, A. Blatt, M. Flanigan and K.Majka, "A Study of Situationally Aware Routing for Emergency Responders," *Journal of the Operational Research Society*, Vol. 66, No. 4, (2015), pp. 570-578. EMERGENCY RESPONSE

2014

R. Wei, A.T. Murray and R. Batta, "A Bounding Based Solution Approach for the Continuous Arc Covering Problem," *Journal of Geographical Systems*, Vol. 16, No. 2, (2014), pp. 161-182. LOCATION ANALYSIS

M. Henchey, R. Batta, M. Karwan and A. Crassidis, "A Flight Time Approximation Model for Unmanned Aerial Vehicles: Estimating the Effects of Flight Dynamics and Wind," *Military Operations Research*, Vol. 18, (2014) pp. 51-68. UAV ROUTING

T. Geetla, R. Batta, A. Blatt, M. Flanigan and K. Majka, "Optimal Placement of Omnidirectional Sensors in a Transportation Network for Effective Emergency Response and Crash Characterization," *Transportation Research Part C: Emerging Technologies* Vol. 45, (2014) pp. 64–82. INTELLIGENT TRANSPORTATION SYSTEMS

R. Batta, M. Lejeune and S. Prasad, "Public Facility Location Using Dispersion, Population, and Equity Criteria," *European Journal of Operational Research*, Vol. 234, No. 3, (2014) pp. 819-829. PUBLIC FACILITY LOCATION

Y. Kang, R. Batta and C. Kwon, "Value-at-Risk Model for Hazardous Material Transportation," *Annals of Operations Research*, Vol. 222, (2014), pp. 361-387. HAZMAT ROUTING

Y. Kang, R. Batta and C. Kwon, "Generalized Route Planning Model for Hazardous Material Transportation with VaR and Equity Considerations," *Computers and Operations Research*, Vol. 43, (2014), pp. 237-247. HAZMAT ROUTING

N. Bednowitz, R. Batta and R. Nagi, "Dispatching and Loitering Policies for Unmanned Aerial Vehicles under Dynamically Arriving Multiple Priority Targets," *Journal of Simulation*, Vol. 8, (2014) pp. 9-24. UAV ROUTING

2013

M. Henchey, R. Batta, A. Blatt, M. Flanigan and K.Majka, "A Simulation Approach to Studying Emergency Response in an Advanced Transportation System," *Journal of Simulation* 8, (2013), pp. 115-128. EMERGENCY RESPONSE

G. Galindo and R. Batta, "Prepositioning of Supplies for Hurricanes under Demand Uncertainty," *Socio-Economic Planning Sciences*, Vol. 47, No. 1, (2013), pp. 20-37. HUMANITARIAN LOGISTICS

G. Galindo and R. Batta, "Review of Recent Developments in OR/MS Research in Disaster Management," *European Journal of Operational Research*. Vol. 230, No. 2, (2013), pp. 201-211. HUMANITARIAN LOGISTICS

2012

J. Wang, Y. Kang, C. Kwon and R. Batta, "Dual Toll Pricing for Hazardous Material Transport with Linear Delay," *Networks and Spatial Economics*, Vol. 12, No. 1, (2012), pp. 147-165. HAZMAT ROUTING

Y-H. Lin, R. Batta, P. Rogerson, A. Blatt and M. Flanigan, "Location of Temporary Depots to Facilitate Relief Operations after an Earthquake," *Socio-Economic Planning Sciences*, Vol. 42, No. 2, (2012), pp. 112-123. HUMANITARIAN LOGISTICS

F. Mufalli, R. Batta and R. Nagi, "Simultaneous Sensor Selection and Routing of Unmanned Aerial Vehicles for Complex Mission Plans," *Computers and Operations Research*, Vol. 39, No. 11, (2012), pp. 2787-2799. UAV ROUTING

X. Nie, G. Parab, R. Batta and L. Lin, "Simulation-Based Selectee Lane Queueing Design for Passenger Checkpoint Screening," *European Journal of Operational Research*, Vol. 219, No. 1, (2012), pp. 146-155. AIRPORT SECURITY

P. Berglund and R. Batta, "Placement of Warehouse Cross Aisles," *IIE Transactions*, Vol. 44, No. 2, (2012), pp.107-120. WAREHOUSE DESIGN

J. Yates, R. Batta, I. Casas and M. Karwan, "Establishing Public Policy to Protect Critical Infrastructure: Finding a Balance Between Exposure and Cost in Los Angeles County," *Transport Policy*, *24*, (2012), pp. 109-117. HOMELAND SECURITY

2011

J.A. Paul and R. Batta, "Improving Hurricane Disaster Preparedness: Models for Optimal Reallocation of Hospital Capacity," *International Journal of Operational Research*, Vol. 10, No. 2, (2011), pp. 194-213. HUMANITARIAN LOGISTICS

M. Zhang, R. Batta and R. Nagi, "Designing Manufacturing Facility Layouts to Mitigate Congestion," *IIE Transactions*, Vol. 45, No. 4, (2011), pp. 132-145. LAYOUT DESIGN

Y-H. Lin, R. Batta, P. Rogerson, A. Blatt, M. Flanigan, and K. Lee, "A Logistics Model for Emergency Supply of Critical Items in the Aftermath of a Disaster," *Socio-Economic Planning Sciences*, Vol. 45, No. 4, (2011), pp. 132-145. HUMANITARIAN LOGISTICS

J. Yates, R. Batta and M. Karwan, "Optimal Placement of Sensors and Interception Resource Assessment for Protection of Regional Infrastructure from Covert Attack," *Journal of Transportation Security*, *4*(2), (2011), pp. 145-169. HOMELAND SECURITY

2010

M. Flanigan, A. Blatt, M. Russell, R. Batta and K. Lee, "Emergency Response Technology and Integrated Active Transportation System," *Transportation Research Record*, No. 2189,(2010), pp. 26-36. INTELLIGENT TRANSPORTATION SYSTEMS

E. Tokar Erdermir, R. Batta, P. Rogerson, A. Blatt and M. Flanigan, "Joint Ground/Air EMS Coverage Models," *European Journal of Operational Research*, 2072, (2010), 736-749. EMERGENCY RESPONSE

M. A. Akella, E. Delmelle, R. Batta, P. Rogerson and A. Blatt, "Adaptive Cell Tower Location Using Geostatistics," *Geographical Analysis*, 42:3, (2010), 227-244. CELL TOWER LOCATION

2009

S. Huang, R. Batta and R. Nagi, "Simultaneous Siting and Sizing of Distribution Centers in the Plane," *Annals of Operations Research*, 167:1, (2009), 157-170. WAREHOUSE LOCATION

X. Nie, R. Batta, C. Drury and L. Lin, "The Impact of Joint Responses of Devices in an Airport Security System," *Risk Analysis*, 29:2, (2009), 298-311. AIRPORT SECURITY

A. Jotshi and R. Batta, "Search for Two Immobile Entities on a Network," *International Journal of Mathematics of Operations Research*, 1:1/2, (2009), 37–75. SEARCH THEORY

A. Jotshi, Q. Gong and R. Batta, "Dispatching and Routing of Emergency Vehicles in Disaster Mitigation Using Data Fusion," *Socio-Economic Planning Sciences*, 43:1, (2009), 1-24. HUMANITARIAN LOGISTICS

X. Nie, R. Batta, C. Drury and L. Lin, "Passenger Grouping with Risk Levels in an Airport Security System," *European Journal of Operational Research*, 194, (2009), 574-584. AIRPORT SECURITY

A. Sarkar, R. Batta and R. Nagi, "Finding Rectilinear Least Cost Paths in the Presence of Convex Polygonal Congested Regions," *Computers & Operations Research*, 36, 3, (2009), 737-754. LAYOUT PATH PLANNING

M. Zhang, S. Savas, R. Batta and R. Nagi, "Facility Placement with Sub-Aisle Design in an Existing Layout," *European Journal of Operational Research*, 197, 1 (2009), 154-206. FACILITY LAYOUT

M. Zhang, R. Batta and R. Nagi, "Modeling of Workflow Congestion and Optimization of Flow Routing in a Manufacturing/Warehouse Facility," *Management Science*. 55, (2009), 267-280. VEHICLE ROUTING IN A FACTORY

2008

J. Paul and R. Batta, "Models for Hospital Location and Capacity Allocation for an Area Prone to Natural Disasters," *International Journal of Operational Research* 3, (2008), 473-496. HUMANITARIAN LOGISTICS

A. Jotshi and R. Batta, "Search for an Immobile Entity on a Network," *European Journal of Operational Research*, 191, (2008), 347-359. SEARCH THEORY

I. Casas, R. Garrity, D. Mandloi, M. Sunm, J. Weaver, R. Nagi and R. Batta, "A Spatial Decision Support System Combining GIS and OR Tools to Optimize District Boundaries and Bus Routes for a Suburban School District," *OR Insight*, 21, 2, (2008) 3-16. SCHOOL DISTRICTING

M. R. Akella, R. Batta, M. Sudit, P. Rogerson and A. Blatt, "Cellular Network Configuration with Co-channel and Adjacent Channel Interference Constraints," *Computers and Operations Research*. 35, (2008), 3738-3757. CELLULAR APPLICATIONS

E. T. Erdemir, R. Batta, S. Spielman, P. Rogerson, A. Blatt and M. Flanigan, "Evaluating the Performance of Aeromedical Base Locations of New Mexico by Considering Nodal and Path Demand," *Accident Analysis and Prevention*, 40, (2008), 1105-1114. EMERGENCY RESPONSE

E. T. Erdemir, R. Batta, S. Spielman, P.A. Rogerson, A. Blatt, M. Flanigan, "Location Coverage Models with Demand Originating from Nodes and Paths: Application to Cellular Network Design," *European Journal of Operational Research*, 190, (2008), 610-632. CELLULAR APPLICATIONS

2007

X. Nie, R. Batta, C. Drury and L. Lin, "Optimal Placement of Suicide Bomber Detectors," *Military Operations Research*, 12, (2007), 65-78. HOMELAND SECURITY

I. Casas, A. Malik, E. Delmelle, M. Karwan and R. Batta, "An Automated Network Generation Procedure for Routing of Unmanned Aerial Vehicles (UAVs) in a GIS Environment," *Networks and Spatial Economics*, 7, (2007), 153-176. UAV ROUTING

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Q. Gong and R. Batta, "Allocation and Reallocation of Ambulances to Casualty Clusters in a Disaster Relief Operation," *IIE Transactions* 39, (2007), 27-39. HUMANITARIAN LOGISTICS

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A. Sarkar, R. Batta and R. Nagi, "Placing a Finite Size Facility with a Center Objective on a Rectilinear Plane with Barriers," *European Journal of Operational Research*, 179, 3, (2007), 1160-1176. LAYOUT ANALYSIS

S. Naik and R. Batta, "Propagated Delay Estimation and its Use in the Development of an Effective Aircraft Ground Delay Strategy." *International Journal of Operational Research* 12, (2007) 1-25. AIRLINE SCHEDULING

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2006

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A.Sarac, R. Batta and C. M. Rump, "A Branch-and-Price Approach for Operational Oriented Aircraft Maintenance Routing," *European Journal of Operational Research*, 175, (2006) 1850-1869. AIRCRAFT ROUTING

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1995

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1993

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1992

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L. Lindner-Dutton, R. Batta and M.H. Karwan, "Equitable Sequencing of a Given Set of Hazardous Materials Shipments," *Transportation Science*, 25 (1991) 124-137. HAZMAT ROUTING

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R. Batta and N.R. Mannur, "Covering Location Models for Emergency Situations that Require Multiple Response Units," *Management Science*, 36 (1990) 16-23. LOCATION APPLICATION

1989

R. Batta, " A Queueing and Location Model with Service Time Dependent Queueing Disciplines," *European Journal of Operational Research*, 39 (1989)192-205. STOCHASTIC LOCATION

R. Batta, "The Stochastic Queue Median over a Finite Discrete Set," *Operations Research*, 37 (1989) 648-652. STOCHATSIC LOCATION

R. Batta and O. Berman, "A Location Model for a Facility Operating as an M/G/k Queue," *Networks*, 19 (1989) 717-728. STOCHASTIC LOCATION

R. Batta, J. M. Dolan and N. N. Krishnamurthy, "The Maximal Expected Covering Location Problem: Revisited," *Transportation Science*, 23 (1989) 277-287. STOCHASTIC LOCATION

R. Batta and W.V. Huang, "On the Synthesis of Advertising and Relocation Decisions for a Facility," *Computers & Industrial Engineering*, 16 (1989) 179-187. LOCATION APPLICATION

R. Batta, A. Ghose and US Palekar, "Locating Facilities on the Manhattan Metric with Arbitrarily Shaped Barriers and Convex Forbidden Regions," *Transportation Science*, 23 (1989) 26-36. LOCATION THEORY

1988

R. Batta and U.S. Palekar, "Mixed Planar/Network Facility Location Problems," *Computers & Operations Research*, 15 (1988) 61-67. LOCATION THEORY

R. Batta and S.S. Chiu, "Optimal Obnoxious Paths on a Network: Transportation of Hazardous Materials," *Operations Research*, 36 (1988) 84-92. HAZMAT ROUTING

R. Batta, R.C. Larson and A.R. Odoni, "A Single Server Priority Queuing Location Model," *Networks*, 8 (1988) 87-103. STOCHASTIC LOCATION

R. Batta, "Single Server Queuing Location Models with Rejection," *Transportation Science*, 22 (1988) 209-216. STOCHASTIC LOCATION

R. Batta and L.F. Leifer, "On the Accuracy of Demand Point Solutions to the Planar, Manhattan Metric *p* Median Problem," *Computers & Operations Research*, 15 (1988) 253-262. LOCATION THEORY

1987

R. Batta and U.S. Palekar, "Comment on `Network Median Problems with Continuously Distributed Demand'," *Transportation Science*, 21 (1987) 217. LOCATION THEORY

R. Batta, "Comment on `The Dynamics of Plant Layout'," *Management Science*, 33 (1987) 1065. PLANT LAYOUT

1986

M. Brandeau, S.S. Chiu and R. Batta, "Locating 2 Medians on Tree Network With Continuous Link Demands," *Annals of Operations Research*, 6 (1986) 223-253. LOCATION THEORY

OTHER PUBLICATIONS

Edited Special Issues of Journals

Socio-Economic Planning Sciences Two part special issue on Disaster Planning and Logistics; 2012/2013

Computers and Operations Research Part special Issue on OR Applications in the Military and Counter Terrorism; 2008

Edited Books

R. Batta and C. Kwon, Co-editors for Handbook of OR/MS Models in Hazardous Materials Transportation, Springer Verlag, 2013.

Book Chapters

I. Toumazis, C. Kwon and R. Batta, "Value-at-Risk and Conditional Value-at-Risk Minimization for Hazardous Materials Routing," Handbook of OR/MS Models in Hazardous Materials Transportation, co-edited by R. Batta and C. Kwon, Springer-Verlag, 2013.

W. Yu and R. Batta, "Chinese Postman Problem," Wiley Encyclopedia of OR/MS.

B. Pfeiffer, R. Batta, K. Klamroth and R. Nagi, "Probabilistic Modeling of UAV Path Planning in the Presence of Threat Zones," Handbook of Military Industrial Engineering, co-edited by D. Badiru and M. Thomas.

M. Helander and R. Batta, "A Discrete Transmission Model for HIV," Modeling the AIDS Epidemic, co-edited by E.H. Kaplan and M.L. Brandeau, Raven Press, NY, 1996.

O. Berman, S.S. Chiu, R.C. Larson, A.R. Odoni, and R. Batta, "Location of Mobile Units in a Stochastic Environment," Discrete Location Theory, co-edited by R. L. Francis and P.B. Mirchandani, John Wiley & Sons, NY, (1990) 503-549.

R. Batta, "Demand Point Approximations for Location Problems," Accuracy of Spatial Databases, co-edited by M. Goodchild and S. Gopal, Taylor and Francis, PA, (1989) 197-207. 23

GRANT SUPPORT

National Science Foundation (regular awards)

Collaborative Research: Advancing Supply Prepositioning for Emergency Preparedness by Social Sensing, $369,965, 2017-2020. R. Batta and Q. He are co-PIs. Y. J. Son from University of Arizona is our collaborator and has a separate $150,000 budget.

Collaborative Research: Regulating Hazardous Materials Transportation by Multi-Objective Dual Toll Pricing, $318,362, 2011-2014. R. Batta and C. Kwon are co-PIs. Y. J. Son from University of Arizona is our collaborator and has a separate $150,000 budget.

Inspection Strategies in Airport Security Systems, $300,000, 2005-2008. R. Batta, C. Drury and L. Lin are co-PIs. Also got an REU Supplement for $12,000 and an IREE Supplement for $15,000.

Congestion in Facilities Location and Layout: Deterministic and Stochastic Models. $200,000, 2003-2006. R. Batta and R. Nagi are co-PIs. Also got an REU supplement--$12,000.

Facility Layout (Re)Design Using Planar & Network Location Approaches. $255,545. 1998--2001. R. Batta and R. Nagi were Co-PIs. Also got an REU Supplement--$10,000 and International Supplement--$14,000.

Development and Analysis of Conflict-Free Routing Strategies for Free-Ranging Automated Guided Vehicles, $109,961, 1992--1994. R. Batta and M.H. Karwan were Co-PIs. Also got an REU Supplement--$10,000.

National Science Foundation (special programs)

IGERT: Integrated Graduate Education and Research Training in Geographic Information Science. $4,000,000. 2004-2009. Co-PI with 6 other UB Faculty. D.M. Mark is PI/PD.

IGERT: Integrated Graduate Education and Research Training in Geographic Information Science. $3,000,000. 1998-2003. Co-PI with 4 other UB Faculty. D.M. Mark is PI/PD.

National Institute of Justice (regular award)

Detection and Prediction of Geographical Changes in Crime Rates. $221,520.

1999-2001. R. Batta, P. Rogerson and C.M. Rump were co-PIs.

National Center for Geographic Information and Analysis

Research on Aggregation Analysis for Location Problems, NCGIA, $19,600. June 1995 through May 1996.

Research on Aggregation Analysis for Location Problems, NCGIA, $9,500, September 1994 through May 1995.

Research on the Modifiable Areal Unit Problem, Aggregation Analysis for Location Problems, and Modeling Trader Behavior. NCGIA, $8,799, Summer 1994.

Continuation of "Theoretical Analysis of Aggregation Methods in Location-Allocation Models," $8,058, Summer 1993.

Theoretical Analysis of Aggregation Methods in Location-Allocation Models, $7,306, Summer 1992.

Integration of the Hypercube Queueing Model for Police Districting into the ARC/INFO GIS, $7,306, Summer 1991.

Sensitivity Analyses and the Development of Fast and Accurate Algorithms for Locating and Deploying Emergency Facilities in a Congested Environment, $8,369, Summer 1990.

Demand Point Approximation for Location Problems, $7,600, Summer 1989. 24

Center for Transportation Injury Research

Using Advanced Technology for Emergency Response. $210,000. July 2009 through September 2012.

Delivery of Critical Items in a Prolonged Disaster Response Effort. $70,000. July 2008 through June 2009. P. Rogerson is a co-PI.

Models for Air Medical Service Base Location. $40,000. July 2006 through June 2007. P. Rogerson is a co-PI.

Provision of Air Medical Services, and Interpolation of Results from Mobile Sensors. $87,000. January 2005 through May 2006. P. Rogerson is a co-PI.

Coverage Models in Cellular Communications. $77,000. September 2003 through August 2004. P. Rogerson was a co-PI.

Data Analysis and Solution Methods for Coverage Models that arise in Cellular Communications. $70,000. September 2002 through August 2003. P. Rogerson was a co-PI.

Cell Tower Location and Data Analysis Project. $68,000. September 2001 through August 2002. P. Rogerson was a Co-PI.

ACN/Cell-Phone Coverage Project. $57,313. September 2000 through August 2001. P. Rogerson was Co-PI.

CTIR Crash Registry and Cell Phone Coverage Analysis for the ACN System. $67,500. September 1999 through August 2000. P. Rogerson was a Co-PI.

Western New York Baseline Study. $32,000. October 1998 through August 1999. P. Rogerson was a Co-PI.

Research on Building an Accident Data Base, Developing a Probabilistic Model, and Identifying Geographical "Hot Spots" for the ACN Project, $28,881. February 1996 through January 1997. P. Rogerson was a co-PI.

Lockheed Martin

Military Mission Planning. $25,000 grant + $20,000 gift. 2002.

Supply Chain Optimization. $25,000 grant + $14,000 gift. 2001.

Advanced Supply-Chain/Logistics Problems. $25,000. 2000.

Postal Dispatching Study. $25,000. 1999.

Government

Effective and Equitable Supply of Gasoline to Impacted Areas in the Aftermath of a Natural Disaster. $79,572. 2014-15. R. Batta is PD. Co-PIs: C. Kwon and A. Baveja (Rutgers). Funded by Region II University Transportation Research Center.

Optimization Planning and Tactical Intelligent Management of Aerial Sensors (OPTIMAS). $1,171,247. 2008-2011. M. Karwan is PD. Co-PIs: R.Batta, J. Crassidis, R. Nagi, M. Sudit, T. Jasinski, P. Deignan, C. Barsalou, PM: M.Moskal. Funded by Office of Naval Research. 25

Redistricting and School Bus Route Optimization for Sweet Home School District: A GIS Approach. $10,095. 2006. I. Casas is PD. R. Batta and R. Nagi are co-PIs. Funded by the Sweet Home School District, Amherst, New York.

Information Fusion Applied in an Earthquake Disaster Setting. $2,500,000. 2000-2005. P. Scott is PD. J. Llinas, L. Lin, K. Kesavadas, and A. Bisantz are co-PIs. Funded by Air Force Office of Scientific Research.

Innovative Fusion Capabilities: Tracking, Networking and Visualization. $553,564. 2004. T. Singh and R. Nagi are co-PDs, K. Kesavadas and B. Jayaraman are co-PIs. Funded by Rosettex Technology and Ventures Group (NIMA/NGA).

The Design of Police Patrol Operations in the City of Buffalo. $22,300. 1997-1998. C. Rump was a Co-PI.

Buffalo Police Department, Optimal Allocation of Police Cars in the City of Buffalo. $5,000. 1997. C. Rump was a co-PI.

United Airlines

Irregular Operations Optimization. $50,000.

Industry

Routing and Dispatching Software Development for the Center for Transportation Excellence. $45,579. 2007. Funded as a sub-contract through CUBRC.

Computer Based Order Combination Method. $6,662. 2007. Funded by American Coaster Company.

Layout Efficiency Analysis. $11,000. 2007. Funded by Niagara Transformer.

Layout and Analysis of Assembly Packaging Area. $14,000. 2006. Funded by Hydro-Air Components.

Warehouse Layout Study. $16,923. 2006. Funded by Curbell, Inc. R. Nagi is a co-PI.

Manufacturing Layout Study. $16,923. 2006. Funded by Curbell, Inc. R. Nagi is a co-PI.

Optimization of Roll and Sheet Sizes. $14,478. 2005. Funded by MOD-PAC, Inc.

Improvement of Store Room Operations and Inventory Management, Phase-I. $35,882. 2005. Funded by NFTA. L. Lin was a co-PI.

Distributed Mobile Fusion. $50,000. 2001. R. Nagi was a co-PI. Funded by Boeing.

Support for Scheduling Software. $8,500. 2001. L. Lin was a co-PI. Funded by Quebecor Printing.

Operations Analysis and Plant Layout/Facility Redesign Studies. 2001. $9,943. R. Nagi was a co-PI. Funded by Ferro Electronics, Inc.

Assessment of Operation Efficiency/Layout Design and Development of a Computerized Production Scheduling System in Cylinder Manufacturing Operations. $25,000. 2000. L. Lin was a co-PI. Funded by Quebecor Printing.

IE-Related Projects at Buffalo Wireworks, Buffalo Wireworks, Inc., $60,000. 1991-1996.

Capacity Planning and Detailed Scheduling, Clearing Niagara, $23,500. 1995. L. Lin was a co-PI. 26

The Development of Vehicle Routes for Overnight Parcel Deliveries, Federal Express Corporation, $16,500. 1989-1990.

Protective Closures, Inc., Plant Layout. $6,591. 1997.

Diversified Manufacturing, Inc., GRIT project, Process Improvement-Assessment with Implementation. $19,166. 1996-1997. C.G. Drury was a co-PI.

Materials Management and Plant Layout Analysis, Harrison Radiator, $25,000. 1988-1989.

Methods Study for Various Tasks Involved in the Overhauling Procedure of New York City Cars in Blasdell, New York, General Electric Co., $13,524. 1987.

Data Collection, Relationship Analysis and Personnel Training for a Critical Path Method (CPM) Procedure for Overhauling New York City Cars in Blasdell, New York, General Electric Co., $9,223. 1986.

Completed Doctoral Dissertations (Supervised or Co-Supervised)

Total Count = 48

Nan Ding; graduated 8/17. Dissertation title: "Enabling Urban Parcel Pickup and Delivery Services Using All-Electric Trucks." Co-advisor was Changhyun Kwon. Job Placement: OR Analyst, Golf Now, Inc., Orlando, Florida.

Yan-Cheng Hsu; graduated 6/17. Dissertation title: "Mathematical model for solving petroleum replenishment and routing problem." Co-advisor was Jose Walteros. Job Placement: OR Analyst, Ford Research, Dearborn, Michigan.

Hernan Caceres; graduated 1/17. Dissertation title: "A Study of Realistic and Innovative Features of the School Bus Routing Problem." Co-advisor was Qing He. Job Placement: Assistant Professor, Department of Industrial Engineering, Universidad Católica del Norte, Chile.

Michael D. Moskal II; graduated 1/16. Dissertation title: "Adaptive Unmanned Aerial Vehicle Routing Methods for Tactical Surveillance Operations." Job Placement: Scientist, Modus Operandi Inc., Melbourne, Florida.

Masoumeh Taslimi; graduated 1/16. Dissertation title: "On the Analysis of Two Problems Related to Risk Management in Urban Transportation Networks." Co-advisor was Changhyun Kwon. Job Placement: Operations Research Manager, CSX Transportation, Jacksonville, Florida.

Tolou Esfandeh; graduated 8/15. Dissertation title: "Regulating Hazardous Materials Transportation by Dual-Toll Pricing and Time-Dependent Network Design Policies." Co-advisor was Changhyun Kwon. Job Placement: Operations Research Analyst, Innovative Scheduling, Inc., Gainesville, Florida.

Yan Xia; graduated 8/15. Dissertation title: "Routing and Time Allocation Problems in Designing Automatic Control of Unmanned Aerial Vehicles for Information Collection." Co-advisor was Rakesh Nagi. Job Placement: Operations Research Analyst, Amazon, Inc., Seattle, Washington.

Tejswaroop Reddy Geetla; graduated 11/13. Dissertation title: "Applying Operations Research Techniques to Improve Motor Vehicle Crash Emergency Response and Traffic Monitoring Using Intelligent Transportation Sensors." Job Placement: Operations Research Analyst, Federal Express, Inc., Memphis, Tennessee.

Ruben Yie Pinedo; graduated 6/13. Dissertation title: "Safe Transportation with Extreme Danger Zones." Co-advisor was M. Sudit. Job Placement: Assistant Professor, Department of Industrial Engineering, University of Del Norte, Barranquilla, Colombia.

Gina Galindo Pacheco; graduated 1/13. Dissertation title: "Prepositioning Supplies in Preparation for a Foreseen Hurricane." Job Placement: Assistant Professor, Department of Industrial Engineering, University of Del Norte, Barranquilla, Colombia.

Matt Henchey; graduated 12/12. Dissertation title: "Emergency Response in Advance Transportation Systems: Studying Data Capture and Routing Methodologies Using Simulation." Job Placement: Senior Operations Research analyst, Herron Associates, Washington DC.

Yingying Kang; graduated 5/11. Dissertation title: "Value-at-Risk Models for Hazardous Material Transportation." Co-advisor was C. Kwon. Job Placement: Analyst, Southern Pacific Railroad Company, Atlanta, GA.

Frank Muffali; graduated 4/11. Dissertation title: "Simultaneous Sensor Selection and Routing of Unmanned Aerial Vehicles for Complex Mission Plans." Co-advisor was R. Nagi. Job Placement: Analyst, Praxair, Inc., Tonawanda, NY.

Wanyan Yu; graduated 2/11. Dissertation title: "Search for an Entity on a Network." Job Placement: Analyst, Bloomberg Financial Services, Inc., New York.

Yen-Hung Lin; graduated 8/10. Dissertation title: "Delivery of Critical Items in a Disaster Relief Operation: Centralized and Distributed Supply Strategies." Co-advisor was P. Rogerson. Job Placement: Postdoctoral Research Fellow, Department of Industrial Engineering, University of Arkansas.

Amruth Sivalenka; graduated 5/10. Dissertation title: "Pricing and Expiration Management in Apartment Industry." Job Placement: Vice President, Rainmaker Group, Atlanta.

Elif Tokar-Erdermir; graduated 10/08. Dissertation title: "Location-covering models: Nodal and path demand, multiple-type facilities, unavailability of servers." Co-advisor was P. Rogerson. Job Placement: Postdoctoral Associate, Department of Mechanical Engineering, University of Minnesota.

Justin T. Yates; graduated 8/08. Dissertation title: "Network-based Risk Mitigation and Resource Evaluation in the Transportation of Hazardous Materials and Terrorist Threat." Co-advisor was M. Karwan. Job Placement: Assistant Professor, Department of Industrial and Systems Engineering, Texas A&M University. 28

Xiaofeng Nie: graduated 7/08. Dissertation title: "Optimization and Resource Allocation Models in an Aviation Security System." Job Placement: Postdoctoral Associate, School of Business, McGill University.

Min Zhang; graduated 11/07. Dissertation title: "Designing the Layout and Routing of a Manufacturing Facility to Mitigate Workflow Congestion." Co-advisor was R. Nagi. Job placement: Operations Research Analyst, AVIS-Budget Rent-a-Car, New York, New York.

Jomon Paul; graduated 8/06. Dissertation title: "Study of Effects of Facility Damage on Hospital Capacity Estimates and Location-Allocation Planning for Management of Natural Disasters." Co-advisor was L. Lin. Job placement: Visiting Assistant Professor, Kennesaw State University, Georgia.

Arun Jotshi; graduated 8/06. Dissertation title: "Search for an Immobile Entity on a Network." Job placement: Operations Research Analyst, AT&T Corporation, Morristown, New Jersey.

Abhay Joshi; graduated 2/06. Dissertation title: "Optimization Approaches to Network Toplogy Design for Dynamic Distributed Wireless Sensing in a Hostile Environment." Co-advisor was R. Nagi. Job Placement: Operations Research Analyst, Curbell Inc., Orchard Park, New York.

Jayasankar Neelakantan; graduated 9/05. Dissertation title: "Strategies for Clearance-Markdown Optimization in the Retail Industry." Co-advisor was A. Gosavi. Job Placement: Visiting Assistant Professor, Kennesaw State University, Georgia.

Qiang Gong; graduated 9/05. Dissertation title: "Responding to Casualties in a Disaster Relief Operation: Initial Ambulance Allocation and Reallocation, and Switching of Casualty Priorities." Job Placement: Operations Research Analyst, United Airlines, Chicago, Illinois.

Mohan R. Akella; graduated 2/05. Dissertation title: "Base Station Location and Channel Allocation Problems in Cellular Network Design." Job Placement: Operations Research Analyst, Triology, Inc., Bangalore, India.

Simin Huang, graduated 9/04. Dissertation title: "The Connection/Location Problem and its Application to Supply Chain Design." Co-advisor was R. Nagi. Job Placement: Postdoctoral Associate, School of Business, University of Toronto.

Avijit Sarkar; graduated 9/04. Dissertation title: "Finite-Size Facility Placement in the Presence of Generalized Congested Regions." Co-advisor was R. Nagi. Job Placement: Visiting Assistant Professor, University of Toledo.

William J. Frank; graduated 9/01. Dissertation title: "On Investigating the Effect of Temporal Link Parameters on Hazmat Route Selection." Job Placement: Postdoctoral Associate, CMIF Lab, University at Buffalo (SUNY).

Vedat Akgun; graduated 2/01. Dissertation title: "Routing Hazardous Materials in the Presence of Weather Systems." Co-advisor was C. Rump. Job Placement: Senior System Analyst, Emery Worldwide Airways.

Abdul Sarac; graduated 2/01. Dissertation title: "Daily Operational Aircraft Maintenance Routing Problem." Co-advisor was C. Rump. Job Placement: Operations Research Analyst, United Airlines, Chicago, Illinois.

Shoou-Jiun Wang; graduated 9/00. Dissertation title: "Optimal Police Enforcement Allocation - A Socio-Economic Model of Criminal Geographic Displacement." C. Rump was a co-advisor. Job placement: First USA Bank, Wilmington, Delaware.

Selcuk Savas; graduated 9/00. Dissertation title: "A Spatial Modeling Perspective to Problems in Facilities Design." R. Nagi was a co-advisor. Job Placement: Assistant Professor, Koc University, Istanbul, Turkey.

Qian Wang; graduated 9/00. Dissertation title: "Discrete Facility Location Design with Stochastic Customers and Immobile Servers." Co-advisor was C. Rump. Job Placement: Senior Operations Research Specialist, Synquest, Inc., Washington, D.C.

Christopher Oboth; graduated 2/97. Dissertation title: "Conflict-Free Routing of Automated Guided Vehicles: A Simulation Study." M. Karwan was a co-advisor. Job Placement: Lecturer, Makede University, Uganda.

Peiwu Zhao; graduated 6/96. Dissertation title: "Analysis of Aggregation Effects in Location Problems." Job Placement: OR Analyst, ESRI Corporation, San Bernadino, California.

Ramprasad T. Narasimhan; graduated 1/96. Dissertation title: "Conflict-Free Routing and Scheduling of Automated Guided Vehicles." M. Karwan was a co-advisor. Job Placement: Analyst, Corporate Research, United Airlines, Chicago, Illinois.

Linda Chattin; graduated 9/94. Dissertation title: "Maximizing Expected Coverage Using State Sensitive Dispatch Assignments." Job Placement: Lecturer, Department of Industrial Engineering, State University of New York at Buffalo.

Alok Baveja; graduated 9/93. Dissertation title: "Crackdowns on Drug Markets." M. Karwan was a co-advisor. Job Placement: Assistant Professor, Department of Management Science, Rutgers, Camden, New Jersey.

Thomas D. Hill; graduated 9/93. Dissertation title: "Equity Constrained Preventive Police Patrolling." Job Placement: Lecturer, Dept. of Ind. Engg., SUNY at Buffalo.

Honghua Jin; graduated 9/93. Dissertation title: "Routing of Hazardous Materials: A Probabilistic Perspective." M. Karwan was a co-advisor. Job Placement: Systems Analyst, U.S. Steel Corporation, Gary, Indiana.

Dake Sun; graduated 9/93. Dissertation title: "Dynamic Job Shop Scheduling: An Integrated Approach." Li Lin was a co-advisor. Job Placement: OR Analyst, AVIS Rent-a-Car, New York, New York.

Raj A. Sivakumar; graduated 9/92. Dissertation title: "Transportation of Hazardous Materials: A New Modeling Perspective." M. Karwan was a co-advisor. Job Placement: Senior Analyst, Corporate Research, United Airlines, Chicago, Illinois.

Mary Helander; graduated 9/92. Dissertation title: "A Discrete Framework for Modeling and Analyzing HIV Transmission Dynamics." Job Placement: Assistant Professor, Department of Industrial Engineering and Information Systems, Northeastern University, Boston, Massachusetts.

Mamnoon Jamil; graduated 6/91. Dissertation title: "The 1-Center Problem with Queueing." Job Placement: Assistant Professor, Department of Management Science, Rutgers, Camden, New Jersey.

Robert F. Dell; graduated 9/90. Dissertation title: "Development of Equitable Vehicle Routes for Overnight Parcel Deliveries." M. Karwan was a co-advisor. Job Placement: Assistant Professor, Department of Operations Research, Naval Postgraduate School, Monterey, California.

Nirup N. Krishnamurthy; graduated 9/90. Dissertation title: "Modeling Blocking in Automated Guided Vehicle Systems." M. Karwan was a co-advisor. Job Placement: Analyst, Corporate Research, United Airlines, Chicago, Illinois.

Wilfred V. Huang; graduated 2/87. Dissertation title: "The Effects of Special Cost Functions and Promotion in Locational Decisions." Job Placement: Assistant Professor, Division of Industrial Engineering, Alfred University, Alfred, New York.

Completed Master's Theses (Supervised or co-Supervised)

Total Count = 50

Abhinav Khare, graduated 07/16. Thesis title: "Computational Advances in Relief Distribution Models on Tree Graphs." Jee-Un (Jamie) Kang was a co-advisor.

Harshavardhan Vempati, graduated 7/16. Thesis title: "Studying the Impact of a Distance Constraint and Inspection Points on Hazmat Transportation Risk." Joyendu Bhadury was a co-advisor.

Rahul Swamy, graduated 01/16. Thesis title: "Hurricane Evacuation Planning using Public Transportation." Jee-Un (Jamie) Kang was a co-advisor.

Mingyu Kim, graduated 06/15. Thesis title: "Optimal Routing of Infiltration Operations." Qing He was a co-advisor.

Bijaya Rath, graduated 09/14. Thesis title: "Case Studies Related to Prepositioning Supplies Related to a Hurricane Disaster."

Mike Moskal, graduated 08/13. Thesis title: "A Mathematical Programming Approach to Immobile Entity Search."

Atieh Madani, graduated 08/13. Thesis title: "Enhancement to a Staffing Model for a Service Center with Flexible Servers." M. Karwan was a co-advisor.

Tejswaroop Geetla, graduated 04/11. Thesis title: "Air Marshall Scheduling to Meet a Game Theoretic Solution."

Chien-Chi Peng, graduated 03/11. Thesis title: "Optimizing the Layout of a Grocery/Convenience Store to Maximize Revenue from Impulse Items."

Gautam Pranab, graduated 01/11. Thesis title: "Simulation-Based Selectee Lane Queueing Design for Passenger Checkpoint Screening."

Shrideep Shadale, graduated 12/08. Thesis title: "Optimal Grocery Store Layout to Maximize Impulsive Item Revenue."

Partibhan Thalayan, graduated 8/08. Thesis title: "Comparative Study of Item Storage Policies, Vehicle Routing Strategies and Warehouse Layouts Under Congestion." R. Nagi was a co-advisor.

Esra Cosar, graduated 9/05. Thesis title: "Performance Evaluation of a Mathematical Programming Based Clustering Algorithm for a Wireless *Ad hoc* Network Operating in a Threat Environment." R. Nagi was a co-advisor.

Viral Garach, graduated 2/05. Thesis title: "Enforcing Equity by Route Selection in Hazardous Materials Transportation."

Amit Malik, graduated 9/04. Thesis title: "Routing of Unmanned Aerial Vehicles (UAVs) to Reduce the Possibility of Detection." M. Karwan was a co-advisor.

Sameer Naik, graduated 9/04. Thesis title: "Delay Estimation and its Impact on the Aircraft Ground Holding Problem."

Karen S. Holness, graduated 6/04. Thesis title: "A Case Study in Personnel Assignment." C. Drury was a co-advisor.

Amit Parekh, graduated 9/03. Thesis title: "Dynamic Shortest Path Algorithms for Routing of a Hazmat Truck in the Presence of Weather Systems." C. Rump was a co-advisor.

Nishant Mishra, graduated 9/03. Thesis title: "Capacity and Non-Steady State Generalizations to the Dynamic MEXCLP Model for Distributed Sensing Networks." R. Nagi was a co-advisor.

Karthik Tyagarajan, graduated 9/03. Thesis title: "Routing Aircraft to Minimize the Chance of Detection During Mission Ingress." M. Karwan was a co-advisor.

Seethal Mishra, graduated 6/03. Thesis title: "A Rule Based Approach for Handling Time Critical Targets in a Dynamic Battlefield Environment."

Lazar Babu, graduated 6/03. Thesis title: "Airport Security System Design." L. Lin was a co-advisor.

Hari Kettalachu, graduated 6/03. Thesis title: "Contour Line Construction for a New Rectangular Facility in an Existing Layout with Rectangular Departments." R. Nagi was a co-advisor.

Dipeshkumar J. Patel, graduated 2/03. Thesis title: "Clustering Sensors in Wireless *Ad hoc* Networks Using a Dynamic Expected Coverage Model." R. Nagi was a co-advisor.

Mohan Akella, graduated 2/03. Thesis title: "Base Station Location and Channel Allocation in a Cellular Network with Emergency Coverage Requirements."

Geetika Rana, graduated 9/02. Thesis title: "Optimizing Inventory Levels and Order Fulfillment Strategies in a Supply Chain."

Avijit Sarkar, graduated 6/02. Thesis title: "Study of Rectilinear Least Cost Travel (Path and Entry/Exit) through Convex Polygonal Congested Regions." Rakesh Nagi was a co-advisor.

H-C. Su, graduated 6/02. Thesis title: "A Queueing Model of Airline Passenger Demand Spill and Recapture for Revenue Management." C. Rump was a co-advisor.

Feng Gao, graduated 6/02. Thesis title: "A Constrained Transportation Model for Optimizing Crackdowns on Illicit Drug Markets." C. Rump was a co-advisor.

Goutham Ekollu, graduated 9/01. Thesis title: "Three Tier Flight Attendant Recovery Model During Airline Disruptions." C. Rump was a co-advisor.

Mayur Vamanan, graduated 2/01. Thesis title: "A Heuristic for Optimal Order Fulfillment in an (s,S) Inventory System with Stochastic Customer Demands."

Pavan Kumar Nandikonda, graduated 9/00. Thesis title: "1-Center Facility Placement in a Rectilinear Plane with Barriers." R. Nagi was a co-advisor.

Mohamed H. Badr; graduated 9/98. Thesis title: "Dyanmic Facility Location with Time Varying Demands." J. Bhadury was a co-advisor.

Jorge H. Jaramillo; graduated 9/98. Thesis title: "Genetic Algorithms for Location Problems." J. Bhadury was a co-advisor.

Steven J. D'Amico; graduated 9/97. Thesis title: "Allocation of Police Patrol Cars in the City of Buffalo." C. Rump was a co-advisor.

Abdulkadar Sarac; graduated 6/97. Thesis title: "One Dimensional Systematic Search with Finite Defect Length." C. Drury was a co-advisor.

Colleen Eagen; graduated 2/96. Thesis title: "Practical Hazardous Materials Routing Under Insurance Parameters."

Amitabh Bansal; graduated 9/94. Thesis title: "Analysis of Error due to Aggregation of Demand in Location Problems."

Pradeep Bandla; graduated 6/94. Thesis title: "Aircraft Route Selection for Effective Maintenance Repairs."

Gautham Vemuganti; graduated 2/93. Thesis title: "A Hardware Simulation of an AGV System." L. Lin was a co-advisor.

George Martin; graduated 6/92. Thesis title: "Police Patrol Routing."

Mojgan Faraji; graduated 2/90. Thesis title: "A New Dispatching Control Policy that Eliminates Blocking in an Existing Multi-Vehicle Automatic Guided Vehicle System (AGVS) by forming Cells--A Simulation Study."

Raj A. Sivakumar; graduated 9/89. Thesis title: "Modeling Wind Effects in the Transportation of Liquefied Gas Hazardous Materials."

V. A. Viswanathan; graduated 9/89. Thesis title: "Demand Point Approximations for the Planar, Euclidean Metric, p-Median Problem, With and Without Barriers to Travel."

Yolanda M. Carson; graduated 9/88. Thesis title: "Locating an Ambulance on the State University of New York at Buffalo Amherst Campus."

Sharad Elhence; graduated 9/88. Thesis title: "Modeling Uncertainties in Plant Layout Problems."

Krishna S. Kolluri; graduated 9/88. Thesis title: "Multiple Routing for Equity of Risk in the Transportation of Hazardous Materials." M. Karwan was a co-advisor.

Heidi J. Wild; graduated 6/88. Thesis title: "Optimization of a Deterministic Conveyor System."

Ram Gopalan; graduated 9/87. Thesis title: "Modeling the Equity of Risk in the Transportation of Hazardous Materials." M. Karwan was a co-advisor.

June M. Squilla; graduated 6/86. Thesis title: "Relaxing the Independence Assumption of a Maximal Covering Location Problem."

Teaching

Formal classroom teaching:

When teaching IE 575, a required graduate course for our operations research students, I focus on the fundamentals of applied probability. The course is challenging and yet very rewarding both for the students and for myself. The material covered is of significant use in other classes that the students take.

When teaching IE 504, a required graduate course for our production systems students, I focus on the specifics of the field of facilities design. Here I heavily use my experiences on industry-sponsored projects. I report back to the class the results of two recent industry projects that I undertook with former students of the class. I also tie in the results of recent research work that has been accomplished by my graduate students into the course.

When teaching IE 678, an elective graduate course for our operations research students, I focus on applications of operations research in the area of urban systems. In this course I challenge the students extensively, both in class and in assigned homework. The material is conceptually difficult but yet it is very much possible to discuss it in an interesting way, which is why I cherish the opportunity each time I teach the course.

Interaction with masters and doctoral students:

I have had the good fortune of advising many graduate students—43 completed masters and 37 completed doctoral students (supervised or co-supervised) over the past 27 years. For me the most challenging part of working with a student for a doctorate or masters is to train them to be an independent researcher and to instill in them the desire for scientific enquiry. I pride myself with my work with graduate students and in the fact the overwhelming majority of my 105 journal papers have been co-authored with former students. Also, the vast majority of these papers are published in the best journals of my field, like *Operations Research, IIE Transactions, Transportation Science, Networks, Management Science, Computers & Operations Research* and *European Journal of Operational Research.*

Interaction with graduate students to execute industry-sponsored projects:

I have worked on many local industry projects (usually 1-2 per year) through The Center for Industrial Effectiveness and some directly through companies. All of these projects have involved the use of graduate students. I have used these opportunities to train graduate students on how to execute a project, i.e. first conceptualize the problem, gather the relevant data, perform the analysis, and finally present results in a coherent presentation. This training—particularly that of project completion within a slated timeframe—has had several benefits. First, it has been excellent practical experience for students who have used it successfully to find a suitable job upon graduation—it is a great conversation piece at an interview. Second, I have taken materials from several of these projects and incorporated them in my IE 504 class—this has a magnifying effect on the impact to students. Third, it has led to several research papers, both directly (write ups of the project in a journal) and indirectly (by identifying inherent theoretical problems in a specific type of industry, leading to proposals to NSF and/or journal papers).

Consulting

The Center for Industrial Effectiveness at University at Buffalo (SUNY): Work on a regular basis to solve relevant problems in local industry. On average perform 2 projects of this type each year. The most recent projects are with Williamsville Central Schools, FMC corporation (chemical manufacturer), American Coaster (manufactures of coasters), Hydro-air (heater and air conditioning unit manufacturer), Curbell, Inc. (hospital electronic accessory manufacturer), MOD-PAC, Inc. (package printing operation), NFTA (our region's transportation authority), and Quebecor, Inc. (book printing operation). These projects are usually 6-12 weeks long and often consist of two phases. In the first phase there is an assessment offered with specific recommendations on how to move forward. The second phase involves studying one or more specific problems in depth and making recommendations for improvement. The projects vary from those in supply chain (ex: inventory control; production scheduling; forecasting; materials requirement planning) to facilities design (warehouse layout; manufacturing facility layout).

Georgia-Pacific/Fort James; Atlanta/Chicago: Served for a period of 3 years as a strategic consultant in the area of supply-chain. Projects that I was associated with included those related to supply-chain integration, and in specific with the translation of a strategic plan for production in factories to the detailed factory schedules needed to support that plan. Another aspect that I was involved in was the development of a simulation model to help plan for spikes in demand due to customer promotions. A third aspect of the work related to asset management in factories as well as opening/closing of distribution centers so as to better meet customer demand.

Buffalo Wireworks, Inc.; Buffalo: Worked as a strategic consultant for a period of 8 years to help facilitate a complete business transformation of the company. Over this extensive period of interaction several projects were undertaken. These included time studies of production tasks and the use of these to more accurately price and schedule products. Also, the entire supply chain, from vendors to customers was optimized, first in individual pieces and then across each of these pieces. Finally, a quality initiative was undertaken at the company to encompass quality control in key manufacturing areas as well as statistically-based inspection of incoming and outgoing goods.

American Stock Exchange; New York City: Worked as a consultant in the area of queueing models for stock transactions for a period of 3 months. The project involved the use of queueing theory principles to model the working of a stock exchange. This allowed us to capture transaction delays that were likely to occur given a specific computer technology. The sizing of the computational resources needed to handle the demands of the exchange was the specific issue examined.

Texas Instruments; Houston: Worked as a consultant in the area of production planning of repairs for a period of 3 months. The entire process was modeled as an optimization problem and this was solved to yield the best assignment of workers to workstations to most efficiently handle the repair process.

NYNEX Science and Technology; White Plains, New York: Worked as a consultant in the area of financial engineering to help develop an options trading station for a period of 3 months. The idea of this station was to allow an investor to study the diversification effects in portfolio risk by introducing various stock options into the mix of traditional equities.

Professional Conference and University Presentations (January 2010 through August 2017)

R. Auad and R. Batta, "Location-Coverage Models for Preventing Attacks on Interurban Transportation Networks," POMS International Meeting, Tel Aviv, Israel, June 2017.

G. Galindo and R. Batta, "A Forecast Driven Model for Prepositioning Supplies in Preparation for a Hurricane," INFORMS Conference, Nashville, TN, November 2016.

N. Ding, C. Kwon and R. Batta, "Economic Analysis on Adopting Strategies of Electric Vehicles for Urabn Parcel Delivery Industry," INFORMS Conference, Nashville, TN, November 2016.

A. Barkousaraie and R. Batta, "Convoy Formation Process," INFORMS Conference, Nashville, TN, November 2016.

H. Caceres, R. Batta and Q. He, "Pricing Tax Return for Students that Opt-out from Using School Bus," INFORMS Conference, Nashville, TN, November 2016.

Y. Hsu, J. Walteros and R. Batta, "A Mathematical Programming Framework that Integrates Customer Decisions Within the Distribution Planning of Petroleum Products," INFORMS Conference, Nashville, TN, November 2016.

N. Ding and R. Batta, "Locating Depots to Facilitate Routing a Mixed Fleet of Electric and Conventional Vehicles," INFORMS Conference, Nashville, TN, November 2016.

R. Batta and B. Bhattacharya, "Using Mobile Clinics to Address Equity in Pharmaceutical Supply Chains in Low-resource Settings," INFORMS Conference, Nashville, TN, November 2016.

N. Ding, R. Batta and C. Kwon, "Locating Depots to Facilitate Routing a Mixed Fleet of Electric and Conventional Vehicles," XXIII Workshop of EURO Working Group on Locational Analysis, Malaga, Spain, September 2016.

R. Auad and R. Batta, "A Multi-objective Model for Preventing and Responding to Attacks on Interurban Transportation Networks," 28th European Conference on Operational Research, Poznan, Poland, July 2016.

R. Batta and M. Moskall, "Simultaneously Determining Ingress/Egress Points and Time Allocations for UAV Grid Routing," 28th European Conference on Operational Research, Poznan, Poland, July 2016.

H. Cacares, R. Batta and Q. He, "Pricing Tax Return for Students that Opt-out from using School Bus," ISERC Conference, Anaheim, CA, May 2016.

H. Cacares, R. Batta and Q. He, "Pricing Tax Return for Students that Opt-out from using School Bus," Land-Translog 3 Meeting, Santa Cruz, Chile, March 2016.

R. Auad and R. Batta, "Location-Coverage Models for Preventing Attacks on Interurban Transportation Networks," Land-Translog 3 Meeting, Santa Cruz, Chile, March 2016.

R. Batta, C. Kwon and X. Li, "Effective and Equitable Supply of Gasoline to Impacted Areas in the Aftermath of a Natural Disaster," INFORMS Annual Meeting, Philadelphia, November 2015.

R. Batta, M. Taslimi and C. Kwon, "Comprehensive Framework for Hazmat Network Design, Response Team Location, and Equity of Risk," INFORMS Annual Meeting, Philadelphia, November 2015.

A. S. Barkousaraie, R. Batta and M. Sudit, "Sea Escort Transportation," INFORMS Annual Meeting, Philadelphia, November 2015.

T. Esfandeh, C. Kwon and R. Batta, "Hazmat Network Design using Time-dependent Consecutive Road Closures Considering Intermediate Stops," INFORMS Annual Meeting, Philadelphia, November 2015.

H. Cacares, R. Batta and Q. He, "A Heuristic for School Bus Routing of Special-education Students," INFORMS Annual Meeting, Philadelphia, November 2015.

M. Taslimi, R. Batta and C. Kwon, "A Dynamic Load-dependent Vehicle Routing Schedule for Minimizing Risk in Medical Waste Collection," INFORMS Annual Meeting, Philadelphia, November 2015.

R. Batta, "Routing a Fleet of Vehicles for Decentralized Reconnaissance with Shared Workload among Regions with Uncertain Information," Department of Management Science, George Washington University, Washington DC, May 2015.

R. Batta, "School Bus Routing with Stochastic Demand and Duration Constraints," Department of Management Science, University of Waterloo, Waterloo, Canada, April 2015.

R. Batta, "An Exact Method for the Peace-Time Convoy Movement Problem to Minimize Civilian Traffic Disruption," Department of Industrial and Systems Engineering, University of Southern California, Los Angeles, California, April 2015.

R. Batta, "An Adaptive UAV Routing Model with Uncertainty on Intelligence Values," Deaprtment of Management Science, McMaster University, Hamilton, Canada, February 2015.

A. Sadeghnejad-Barkousaraie, R. Batta and M. Sudit, "Maritime Escort Transportation: Tugboat Scheduling," ISERC Annual Meeting, Nashville, June 2015.

M. Kim, R. Batta and Q. He, "Otimal Routing of Infiltration Operations," INFORMS International Meeting, Montreal, Canada, June 2015.

R. Batta, "School Bus Routing with Stochastic Demand and Duration Constraints," Department of Industrial Engineering and Management Sciences, Northwestern University, Evanston, Illinois, October 2014.

R. Batta, "Gasoline Delivery with Due Date Optimization," Verolog Conference, Vienna, Austria, June 2015.

Z. Wu, R. Batta and C. Kwon, "Effective and Equitable Supply of Gasoline to Impacted Areas in the Aftermath of a Natural Disaster," ODYSSEUS Conference, Ajaccio, France, June 2015.

M. Taslimi, R. Batta and C. Kwon, "A Network Design Problem for Hazardous Materials Routing and Emergency Response Units Locating," INFORMS Annual Meeting, November 2014, San Francisco.

H. Caceres, Q. He and R. Batta, "School Bus Routing with Stochastic Demand and Duration Constraints," INFORMS Annual Meeting, November 2014, San Francisco.

M. Moskal and R. Batta, "An Adaptive UAV Routing Model with Uncertainty on Intelligence Values," INFORMS Annual Meeting, November 2014, San Francisco.

C. Kwon, T. Esfandeh and R. Batta, "Dual-Toll Pricing Problem for Regulating Hazmat Transportation under Nonlinear Delay," INFORMS Annual Meeting, November 2014, San Francisco.

A. Sadeghnejad Barkousa, M. Sudit and R. Batta, "An Exact Method for the Peace-Time Convoy Movement Problem to Minimize Civilian Traffic Disruption," INFORMS Annual Meeting, November 2014, San Francisco.

Y. Xia and R. Batta, "Dynamic Search Time Allocation Problem in a Complete Graph," INFORMS Annual Meeting, November 2014, San Francisco.

T. Esfandeh, R. Batta and C. Kwon, "A Time-Dependent Road Ban Design Problem in Hazmat Transportation Network," INFORMS Annual Meeting, November 2014, San Francisco.

R. Batta, M. Lejeune and S. Prasad, "Public Facility Location Using Dispersion, Population, and Equity Criteria," International Symposium on Locational Decisions, June 2014, Naples/Capri, Italy.

R. Batta, "School Bus Routing with Stochastic Demand and Duration Constraints," Seminar, Department of Industrial Engineering and Management Sciences, Northwestern University, Evanston, Illinois.

A. Nikoaeva, R. Batta and J. Zhuang, "Locating Vulnerable Temporary Depots Prior to a Natural Disaster," INFORMS Annual Meeting, October 2013, Minneapolis.

R. Batta and G. Galindo, "Forecast-Driven Model for Pre-positioning Supplies in Preparation for a Foreseen Disaster," INFORMS Annual Meeting, October 2013, Minneapolis

C. Greene, C. Kwon and R. Batta, "Evaluation of Events Involving a Natural Disaster and Hazardous Materials in the OR/MS Field," INFORMS Annual Meeting, October 2013, Minneapolis.

R. Batta and B. Rath, "Case Studies Related to Pre-positioning Supplies for a Hurricane Disaster," INFORMS Annual Meeting, October 2013, Minneapolis.

M. Moskal and R. Batta, "Simultaneously Determining Entry/Egress Points and Time Allocations for UAV Grid Routing," INFORMS Annual Meeting, October 2013, Minneapolis.

Y. Xia, R. Batta and R. Nagi, "UAV Search Optimization under Uncertain Reward," INFORMS Annual Meeting, October 2013, Minneapolis.

T. Esfandeh, C. Kwon and R. Batta, "Dynamic Dual-toll Pricing with Delayed Departure Times in Hazmat Transportation," INFORMS Annual Meeting, October 2013, Minneapolis.

M. Taslimi, C. Kwon and R. Batta, "Combined Toll Pricing and Network Design for Hazardous Materials Transportation," INFORMS Annual Meeting, October 2013, Minneapolis.

G. Galindo and R. Batta, "Prepositioning Supplies in Preparation for a Foreseen Hurricane," TRISTAN Conference, June 2013, San Pedro de Atacama, Chile.

R. Batta. **Member of a Special Panel** on "Emerging Research Trends in Homeland Security and Emergency Response," ISERC Annual Meeting, May 2013, San Juan, Puerto Rico.

R. Batta and G. Galindo. **Tutorial** on "Review of Recent Developments in ISE Research in Disaster Logistics," ISERC Annual Meeting, May 2013, San Juan, Puerto Rico.

T. Geetla and R. Batta, "Mobile Sensor Optimization in a Transportation System to Facilitate Emergency Response." ISERC Annual Meeting, May 2013, San Juan, Puerto Rico.

R. Pinedo and R. Batta. "Safe Path Optimization with a Mandatory Escort Requirement." ISERC Annual Meeting, May 2013, San Juan, Puerto Rico.

R. Batta and G. Galindo, "Prepositioning of Supplies in Preparation for a Hurricane with Forecast Information Updates." INFORMS Annual Meeting, October 2012, Phoenix, Arizona.

C. Kwon, T. Esfandeh, M. Taslimi and R. Batta, "Dual-Toll Pricing and Drivers' Preferences in Hazardous Materials Transportation Regulation." INFORMS Annual Meeting, October 2012, Phoenix, Arizona.

R. Batta, A. Blatt, K. Majka, M. Flanigan and T. Geetla, "A Simulation Based Location of Acoustic Sensors in a Data Fusion Capable Environment." INFORMS Annual Meeting, October 2012, Phoenix, Arizona.

R. Pinedo, R. Batta and M. Sudit, "Routing and Escorting in Risky Transportation Networks." INFORMS Annual Meeting, October 2012, Phoenix, Arizona.

R. Batta and G. Galindo, "Prepositioning of Supplies in Preparation for a Hurrican with Forecast Information Updates." EURO Conference on Operational Research, July 2012, Vilnius, Lithuania.

R. Batta. **Plenary talk** entitled "Recent Advances in Quantitative Techniques Applied to Disaster Planning and Logistics." Turkish National Operations Research and Industrial Engineering Congress, June 2012, Istanbul, Turkey.

R. Batta, "Scenario-Free Approach for Prepositioning of Supplies for Hurricanes under Demand Uncertainty and Potential Destruction of Prepositioned Supplies," Bilkent University Sixth Annual Workshop on Supply Chain and Logistics, June 2012, Ankara, Turkey.

M. Henchey, R. Batta, A. Blatt, M. Flanigan, K. Majka, "Using Advanced Technology to Develop Robust Routes for Emergency Responders." Canadian Operations Research Society Annual Meeting, June 2012, Niagara Falls, Canada.

R. Batta and G. Galindo, "Prepositioning of Supplies for Hurricane Preparation Under Potential Facility Failures," TRANSLOG II Conference, December 2011, Puerto Varas, Chile.

R. Batta. **Panel Discussion** on Research Trends in Homeland Security." INFORMS Annual Meeting, November 2011, Charlotte, North Carolina.

T. Geetla, R. Batta and M. Henchey, "Effective Placement of Accident Detecting Acoustic Sensors on a Road Network." INFORMS Annual Meeting, November 2011, Charlotte, North Carolina.

R. Batta and M. Henchey, "Using Advanced Technology to Develop Robust Routes for Emergency Responders." INFORMS Annual Meeting, November 2011, Charlotte, North Carolina.

R. Batta and G. Galindo, "Prepositioning of Supplies for Hurricanes under Spatial Relations and Demand Uncertainty." INFORMS Annual Meeting, November 2011, Charlotte, North Carolina.

R. Batta, "An Overview of OR/MS Applications in Disaster Logistics," Seminar at Department of Industrial Engineering, July 2011, Tsinghua University, Beijing, China.

R. Batta, "Search for an Immobile Entity on a Network," Seminar at Department of Rothman School of Business, University of Toronto, May 2011, Toronto, Canada.

R. Batta, "Search for an Immobile Entity on a Network," Seminar at Department of Industrial Engineering, Arizona State University, Phoenix, Arizona.

R. Batta and G. Galindo, "A Review of OR Research in Disaster Operations Management," INFORMS Annual Meeting, November 2010, Austin, Texas.

A. Sivalenka and R. Batta, "An Optimization Model for Renewal Pricing and Expiration Management in the Apartment Industry," INFORMS Annual Meeting, November 2010, Austin, Texas.

W. Yu and R. Batta, "Searching for a Mobile Entity on a Network: An Empirical Study," INFORMS Annual Meeting, November 2010, Austin, Texas.

Y. Kang, R. Batta and C. Kwon, "Value-at-Risk Model for Hazmat Transport," INFORMS Annual Meeting, November 2010, Austin, Texas.

Y-H. Lin, R. Batta, A. Blatt, M. Flanigan and P. Rogerson, "Locating Temporary Depots to Facilitate a Post-Disaster Relief Operation: A Case Study," INFORMS Annual Meeting, November 2010, Austin, Texas.

G. Galindo and R. Batta, "Prepositioning of Supply Points in Preparation for a Foreseeable Disaster," INFORMS Annual Meeting, November 2010, Austin, Texas.

R. Pinedo, R. Batta and M. Sudit, "Safe Path Optimization with Local Protection Required," INFORMS Annual Meeting, November 2010, Austin, Texas.

D. Myers, R. Batta and M. Karwan, "Calculating Flight Time for UAVs in the Presence of Obstacles and Incorporating Flight Dynamics," INFORMS Annual Meeting, November 2010, Austin, Texas.

F. Mufalli, R. Batta and R. Nagi, "Simultaneous Sensor Selection and Routing of Unmanned Aerial Vehicles for Complex Mission Plans," INFORMS Annual Meeting, November 2010, Austin, Texas.

J. Wang, R. Batta, Y. Kang and C. Kwon, "Dual Toll Pricing for Hazardous Material Transport with Linear Delay," INFORMS Annual Meeting, November 2010, Austin, Texas.

Y-H. Lin, R. Batta, P. Rogerson, A. Blatt, M. Flanigan, "Distributed Supply in Humanitarian Relief Logistics," IERC Annual Conference, June 2010, Cancun, Mexico.

M. Zhang, R. Batta and R. Nagi, "Material Handling Delivery in the Presence of Varying Speed and Interruptions," IERC Annual Conference, June 2010, Cancun, Mexico.

G. Galindo and R. Batta, "Prepositioning of Supply Points in Preparation for a Foreseen Disaster," IERC Annual Conference, June 2010, Cancun, Mexico.

R. Pinedo and R. Batta, "Safe Path Optimization with Link Protection and Cost Consideration," IERC Annual Conference, June 2010, Cancun, Mexico.