

DAVID MENDONÇA

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APPOINTMENTS

- 2015–2017 *Program Director*, Infrastructure Management and Extreme Events Program, Division of Civil, Mechanical and Manufacturing Innovation, Directorate for Engineering, National Science Foundation (NSF), Arlington, VA.
Program Officer for following NSF programs: Critical Resilient Interdependent Infrastructure Systems and Processes Program; Smart and Connected Communities; Partnership for Innovation: Building Innovation Capacity.
- 2010– *Associate Professor*, Industrial and Systems Engineering Department, Rensselaer Polytechnic Institute, Troy, NY
- 2006–2010 *Associate Professor*, Information Systems Department, New Jersey Institute of Technology, Newark, NJ
- 2001–2006 *Assistant Professor*, Information Systems Department, New Jersey Institute of Technology, Newark, NJ

VISITING AND COURTESY APPOINTMENTS

- 2011– *Associate Professor*, Cognitive Science Department, Rensselaer Polytechnic Institute, Troy, NY
- 2008-2009 *Visiting Researcher*, Department of Informatics, University of Lisbon, Portugal
- 2007 *Visiting Professor*, Faculty of Technology, Policy and Management, Delft University of Technology, Delft, The Netherlands
- 2001–2010 *Associate Professor*, Rutgers University School of Business, Newark, NJ
- 1999 *Visiting Scholar*, Faculty of Technology, Policy and Management, Delft University of Technology, Delft, The Netherlands

PROFESSIONAL PREPARATION

Ph. D.	Rensselaer Polytechnic Institute	Decision Sciences and Engineering Systems	2001
M. S.	Carnegie Mellon University	Public Policy and Management	1994
B. A.	University of Massachusetts at Amherst	English	1990

HONORS AND AWARDS

- National Science Foundation CAREER Award, 2005–2010
- Rensselaer Scholar Fellow, Rensselaer Polytechnic Institute, 1995–96
- Chauncey and Doris Starr Fellow, Rensselaer Polytechnic Institute, 1995–96
- W.W. Cooper Merit Scholar, Carnegie Mellon University, 1992–94
- Member, *Alpha Pi Mu*, the Industrial Engineering Honor Society

RESEARCH SUMMARY

My work develops and applies systems engineering methods in order to understand and extend human decision making processes in high-stakes, time-constrained conditions. This has resulted in three inter-related programs of research: foundational descriptive work on *resilience in human/machine systems*,

particularly for interdependent critical infrastructures exposed to hazards; computational and statistical modeling of key cognitive, behavioral and mechanistic processes in these systems; and development of interactive computer systems to support integrated human/machine decision making within target systems.

PUBLICATIONS

SUBMISSIONS IN PREPARATION OR UNDER REVIEW¹

Renaud, M.*, R. Korolov*, D. Mendonça, and W. Wallace, “Social Network Structure as a Predictor of Social Behavior : The Case of Protest in the 2016 US Presidential Election,” Under review.

Zhang, X.* and D. Mendonça. “Prediction of Group Decisions Based on Group Information Seeking and Information Assembly Behavior.” Under review.

Brooks, J. D.* Mendonça and X. Zhang*. “Efficacy of Incentive Structures for Boundedly-rational Schedulers in Large-scale Queueing Networks.” Under review.

Eaton, J.*, D. Mendonça, W. Gray. “Linking Adaptation to Learning in High-tempo, High-stakes Teamwork.” In preparation.

Cheng, L.* and D. Mendonça. “Computational Modelling of Improvisation: A Review and Synthesis.” In preparation.

Mendonça, D., M. Karohara* and I. Amorim. “Historical Perspectives on Community Resilience: The Case of the 1755 Lisbon Earthquake.” In preparation.

REFEREED JOURNAL PUBLICATIONS (20)

Brooks, J.D.*, K. Kar and D. Mendonça (2016). “Allocation of Flows in Closed Bipartite Queueing Networks.” *European Journal of Operational Research* 255(2) 333-344.

Mendonça, D. and W.A. Wallace (2015). “Factors Underlying Organizational Resilience: The Case of Electric Power Restoration in New York City after 11 September 2001.” *Reliability Engineering & System Safety*. 141 (September) 83–91.

Mendonça, D., W.A. Wallace and B. Cutler and J. Brooks* (2015). “Synthetic Environments for Investigating Collaborative Information Seeking: An Application in Emergency Restoration of Critical Infrastructures.” *Journal of Homeland Security and Emergency Management* 12(3) 763–784.

Mendonça, D., G. Webb, C. Butts and J.D. Brooks* (2014). “Cognitive Correlates of Improvised Behavior in Disaster Response: The Cases of the Murrah Building and the World Trade Center,” *Journal of Crisis and Contingency Management* 22(4) 185-195.

Mendonça, D., J.D. Brooks*, M.R. Grabowski (2014). “Linking Team Composition to Team Performance: An Application to Post-Disaster Debris Removal Operations,” *IEEE Transactions on Human-Machine Systems* 44(3) 315–325.

Osatuyi, B.* and D. Mendonça (2013). “Group Information Foraging under Time Constraint: An Application to Emergency Response Organizations.” *Information Processing and Management* 49(1) 169-178.

¹ * denotes student co-author

Mendonça, D., P. Chang*, Y. Hu*, Q. Gu* (2012), "Simulation, Shared Spaces and Information Management to Support Discovery and Learning: An Application in Emergency Management." *Computer Applications in Engineering Education* 20(12) 232-238.

Chakrabarty, M.* and D. Mendonça (2010). "Information Visualization in Scientific Research: Evidence from Top Journals in Computing and Related Sciences." *Journal of Information Technology Theory and Application* 11(2).

Mendonça, D., G. Webb, C. Butts (2010). "L'Improvisation dans les Interventions d'Urgence : les Relations Entre Cognition, Comportement et Interactions Sociales" (in French; English title "Improvisation in Emergency Response: Linking Cognition, Behavior, and Social Interaction," translators Cassia Blondelot and Marc Lenormand) *Tracés: Revue de Sciences Humaines*, 18, 69–86.

LaContora, J.* and D. Mendonça (2010). "Performance Support Systems in Learning Environments: An Application to Engine Diagnostics." *International Journal of Innovation and Learning* 8(1) 42-57.

Mendonça, D., J. Harrald and T. Jefferson (2007). "Emergent Interoperability: Collaborative Adhocracies and Mix and Match Technologies in Emergency Management." *Communications of the ACM*, 50(3) 45–49.

Mendonça, D. and W. A. Wallace (2007). "A Cognitive Model of Improvisation in Emergency Management." *IEEE Systems, Man and Cybernetics: Part A*, 37(4) 547 - 561.

Mendonça, D. (2007). "Decision Support for Improvisation in Response to Extreme Events." *Decision Support Systems* 43(3) 952–967.

Mendonça, D. and W. A. Wallace (2006). "Impacts of the 2001 World Trade Center Attack on New York City Critical Infrastructures." *Journal of Infrastructure Systems* 12(4) 260-270.

Mendonça, D. and F. Fiedrich (2006). "Training for Improvisation in Emergency Management: Opportunities and Limits for Information Technology," *International Journal of Emergency Management* 3(4) 348-363.

Mendonça, D., G. E. G. Beroggi, D. van Gent and W. A. Wallace (2006). "Assessing Group Decision Support Systems for Emergency Response Using Gaming Simulation." *Safety Science* 44(6) 523-535.

Mendonça, D. and W. A. Wallace (2004). "Studying Organizationally-Situated Improvisation in Response to Extreme Events." *International Journal of Mass Emergencies and Disasters* 22 (2) 5–29.

Mendonça, D., G. E. G. Beroggi and W. A. Wallace (2001). "Decision Support for Improvisation During Emergency Response Operations." *International Journal of Emergency Management* 1 (1) 30–38.

Mendonça, D. and M. Raghavachari (2000). "Comparing the Efficacy of Ranking Methods for Multiple Round-robin Tournaments." *European Journal of Operational Research* 123 (3) 593–605.

Mendonça, D., R. Rush and W. A. Wallace (2000). "Timely Knowledge Elicitation from Geographically Separate, Mobile Experts During Emergency Response." *Safety Science* 35 (1–3) 193–208.

REFEREED CONFERENCE PUBLICATIONS (32)

Eaton, J.*, M. Renaud*, M. Sangster*, D. Mendonça, W. Gray. "Carrying the Team: The Importance of

One Player's Survival for Team Success in League of Legends.” Accepted to *Human Factors and Ergonomics Society 2017 Annual Meeting*.

Zhang, X., D. Mendonça, M. Grabowski and C. Holmes. Improvising Organizational Structure and Process: The Case of Post-disaster Debris Removal Operations. Accepted to *Human Factors and Ergonomics Society 2017 Annual Meeting*.

Sangster, M-D. D., D. Mendonça and W.D. Gray (2016). “Big Data Meets Team Expertise in a Dynamic Task Environment.” In A. Papafragou, D. Grodner and J. Trueswell (eds.), *Proceedings of the 60th Annual Conference of the Human Factors & Ergonomics Society*, 19-23 September, Washington, DC.

Brooks, J., D. Mendonça, X. Zhang and M. Grabowski. (2016). “Estimating Computational Models of Dynamic Decision Making from Transactional Data.” *Group Decision and Negotiation Conference*, 20-24 June, Bellingham, WA.

Zhang, X. and D. Mendonça (2015). “Predicting Group Decisions Based on Group Information Seeking and Assembly Behavior.” *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*, 26-30 October, Los Angeles, CA. 59(1) 642-646.

Diirr, B., M. Borges, D. Mendonça (2015). “Putting plans on track in unforeseen situations.” Accepted short paper for *Information Systems for Crisis Response and Management Conference*, 24-27 May, Kristiansand, Norway.

Mendonça, D., B. Cutler, W. A. Wallace and J.D. Brooks (2014). "Collaborative Training Tools for Emergency Restoration of Critical Infrastructure Systems," *World Conference on Information Systems and Technologies*, 15-18 April, Madeira, Portugal.

Brooks, J., D. Mendonça (2014). “Equity-Effectiveness Tradeoffs in the Allocation of Flows in Closed Queueing Networks.” *2014 IEEE International Systems Conference*, 31 March-3 April.

Brooks, J., D. Mendonça (2013). “Simulating Market Effects on Boundedly Rational Agents in Control of the Dynamic Dispatching of Actors in Network-based Operations,” *Winter Simulation Conference* (Invited Paper), 7-10 December, Savannah, GA.

J. D. Brooks, K. Kar, and D. Mendonça (2013). “Dynamic Allocation of Entities in Closed Queueing Networks: An Application to Debris Removal,” *Proceedings of the 2013 IEEE International Conference on Technologies for Homeland Security*, 12-14 November, Waltham, MA.

J. D. Brooks and D. Mendonça (2013). “Optimizing Hauling Vehicle Mix for Debris Removal: A Queueing Theory Approach,” *Proceedings of the 2013 IEEE International Conference on Technologies for Homeland Security*, 12-14 November, Waltham, MA.

Mendonça, D, J. Brooks and M. Grabowski (2012). “Linking Team Composition to Team Performance in Virtual Organizations: An Application to Post-Disaster Debris Removal Operations,” *2012 INGroup Conference*, 12–14 July, Chicago, IL.

Cirik, A. and D. Mendonça (2009). “Responding to Disaster in Complex Socio-technical Systems: Two Case Studies.” *IEEE International Conference on Systems, Man and Cybernetics*, 11-14 October, San Antonio, TX.

Mendonça, D. and Y. Hu (2009). "Divergent and Convergent Thinking in Emergency Response Organizations." *Human Factors and Ergonomics Society Conference*, 19-23 October, San Antonio, TX.

Mendonça, D. and Y. Hu (2008). "Group Solution Assembly in Response to a Simulated Emergency." *Cognitive Science Conference*, 23-26 July, Washington, DC.

Mendonça, D. and W.A.G.A. Bouwman (2008). "Information and Communications Technology for Crisis Management: Defining an Agenda for Scientific Research." *Next Generation Infrastructures Conference*, Delft, The Netherlands.

Mendonça, D., Y. Hu and Q. Gu (2007) "Cognitive-level Support for Improvisation in Emergency Response." *Information Systems for Crisis Response and Management Conference*, 13-16 May, Delft, The Netherlands.

Mendonça, D. and W.A. Wallace (2006). "Adaptive Capacity: Electric Power Restoration in New York City following the 11 September 2001 Attacks." *2nd International Symposium on Resilience Engineering*, 8-10 November, Nice, France.

Gu, Q. and D. Mendonça (2006). "Group Information Foraging In Emergency Response: An Illustration Incorporating Discrete-Event Simulation." *Winter Simulation Conference*, 3-6 December, Monterey, CA (Invited Paper).

Mendonça, D., D. Peraza and P. Stefan (2005). "Innovation, Risk and Reward during Debris Removal at Ground Zero." *American Society of Civil Engineers Structures Congress*, 20-24 April, New York, NY.

Gu, Q. and D. Mendonça (2004). "Patterns of Group Information-seeking in a Simulated Emergency Response Environment." *Information Systems for Crisis Response and Management Conference*, 18-20 April, Brussels, Belgium.

Chakrabarty, M. and D. Mendonça (2004). "Design considerations for information systems to support critical infrastructure management." *Information Systems for Crisis Response and Management Conference*, 18-20 April, Brussels, Belgium.

Chang, P., D. Mendonça, X. Yao and M. Raghavachari (2004). "An Evaluation of Ranking Methods for Multiple Incomplete Round-robin Tournaments." *Decision Sciences Institute Annual Meeting*, 20-23 December, Boston, MA.

Chakrabarty, M. and D. Mendonça (2004). "Integrating Visual and Mathematical Models for the Management of Interdependent Critical Infrastructures." *IEEE International Conference on Systems, Man and Cybernetics*, 10-13 October, The Hague, The Netherlands.

Mendonça, D. and W. A. Wallace (2004). "Cognition in Jazz Improvisation: An Exploratory Study." *Cognitive Science Society Annual Meeting*, 5-8 August, Chicago, IL.

Hendela, A. and D. Mendonça (2004). "Innovation in Demolition: A Case Study from the Cleanup of Ground Zero." *Americas Conference on Information Systems*, 5-8 August, New York, NY.

Chang, P., D. Mendonça and I. Im (2004). "Inside the Customer: Modeling Cognition during Online Shopping." *Americas Conference on Information Systems*, 5-8 August, New York, NY.

Mendonça, D. and F. Fiedrich (2004). "Design for Improvisation in Computer-based Emergency Response Systems." *Information Systems for Crisis Response and Management Conference*, 3–4 May, Brussels, Belgium.

Gu, Q., D. Mendonça and D. Wu (2003). "An Exploration of Information-Seeking Behavior in Emergency Management." *IEEE International Conference on Systems, Man and Cybernetics*, 5–8 October, Washington, DC.

Venkataraman, P. and D. Mendonça (2003). "Using Process Data to Populate Ontologies." *IEEE International Conference on Systems, Man and Cybernetics*, 5–8 October, Washington, DC.

Mendonça, D., G. E. G. Beroggi and W. A. Wallace (2003). "Evaluating Support for Improvisation in Simulated Emergency Scenarios." *Hawaii International Conference on System Sciences (HICSS-36)*, 6–9 January, Big Island, HI.

Mendonça, D. and W. A. Wallace (2002). "Development of a Decision Logic to Support Group Improvisation: An Application to Emergency Response." *Hawaii International Conference on System Sciences (HICSS-35)*, 7–10 January, Big Island, HI.

Mendonça, D., G. E. G. Beroggi and W. A. Wallace (1999). "Decision Support for Improvisation During Emergency Response Operations." *The International Emergency Management Society Conference*, 8–11 June, Delft, The Netherlands.

NON-REFEREED CONFERENCE PAPERS (3)

Lee II, E., W. A. Wallace, J. Mitchell and D. Mendonça, (2005). "Decision technologies for protection of critical infrastructures." *Working Together: R&D Partnerships in Homeland Security*. Boston, MA, 26–28 April.

Mendonça, D., E. Lee II and W. A. Wallace (2004). "Impact of the 2001 World Trade Center Attack on Critical Interdependent Infrastructures." *IEEE International Conference on Systems, Man and Cybernetics*, 10–13 October, The Hague, The Netherlands.

Lacontora, J. and D. Mendonça (2003). "Communities of Practice as Learning and Performance Support Systems." *IEEE International Conference on Information Technology, Research and Education*, 10–13 August, Newark, NJ.

REFEREED BOOK CHAPTERS (13)

Mendonça, D. (2014). "Sensor-driven Discovery of Resilient Performance: The Case of Debris Removal at Ground Zero, NYC, 2001." in *Resilience Engineering in Practice (v. 2)*, C. Nemeth and E. Hollnagel (eds), Ashgate Publishing Ltd., Aldershot, England.

Mendonça, D. and J. Brooks (2013). "Debris Management" in *Sage Encyclopedia of Crisis Management*.

Mendonça, D. and Z. Franco (2013). "Improvising" in *Sage Encyclopedia of Crisis Management*. in *Sage Handbook of Crisis Management*.

Mendonça, D. and M. Pfaff (2013). "Crisis Simulations" in *Sage Encyclopedia of Crisis Management*.

Mendonça, D. (2013). "Engaging Cognitive Novelty" in *Sage Encyclopedia of Crisis Management*.

Mendonça, D. and Y. Hu (2009). "Cognitive Underpinnings of Resilience: A Case Study of Group Decision in Emergency Response," in *Resilience Engineering Perspectives (v. 2)*. C. Nemeth (Ed.). Ashgate Publishing Ltd., Aldershot, England.

Gu, Q. and D. Mendonça (2008). "Group Information-seeking Behavior in Emergency Response: An Investigation of Expert/Novice Differences," in *Real Time and Deliberative Decision Making*, Linkov, I., E. Ferguson, V.S. Magar (Eds.), Springer.

Mendonça, D. (2008). "Measures of Resilient Performance," in *Remaining Sensitive to the Possibility of Failure*. E. Hollnagel, C. Nemeth, S. Dekkers (Eds.). Ashgate Publishing Ltd., Aldershot, England.

Mendonça, D. and Y. Hu (2006). "Hurricane Katrina Debris Removal Operations: The Role of Communication and Computing Technologies," in *Learning from Catastrophe, Quick Response Research in the Wake of Hurricane Katrina*. Natural Hazards Research & Applications Information Center, University of Colorado, Boulder, CO.

Wallace, W. A., D. Mendonça, E. Lee, J. Mitchell and J. Chow (2003). "Managing Disruptions to Critical Interdependent Infrastructures in the Context of the 2001 World Trade Center Attack," in *Beyond September 11th: An Account of Post-Disaster Research*, J. Monday (Ed.), Natural Hazards Research & Applications Information Center, Public Entity Risk Institute, and Institute for Civil Infrastructure Systems. Special Publication #39. University of Colorado, Boulder, CO, pp. 165–198.

Beroggi, G. E. G., D. Mendonça and W. A. Wallace (2003). "Operational Sustainability Management for the Infrastructure: The Case of Emergency Response," in *Systems Engineering and Management for Sustainable Development*, Andrew P. Sage (Ed.), in *Encyclopedia of Life Support Systems*, EOLSS Publishers, Oxford, UK, <http://www.eolss.net>.

Chopra, K., D. Mendonça, R. Rush and W. A. Wallace (2000). "Acquiring and Assessing Knowledge from Multiple Experts Using Graphical Representations," in *Knowledge-based Systems Vol. I: Techniques and Applications*, Cornelius T. Leondes (Ed.), Academic Press, San Diego, CA, pp. 293–326.

OTHER PUBLICATIONS (8)

Mendonça, D., Q. Gu, J. Osatuyi (2009). "Group Information Foraging in Emergency Response." Collaborative Information Behavior Workshop, *ACM GROUP 2009 Conference*.

Mendonça, D. and B. Van de Walle (2008). "Research Methods in Emergency Management: Introduction to the Special Issue." *International Journal of Emergency Management*, 5(1/2) 1–6.

Mendonça, D., C. Butts and G. Webb (2007). "Creativity and Improvisation after 9/11 and 11/9: Learning from the Response to Two Extreme Events." *Contingency Today*.

Mendonça, D. and F. Fiedrich (2006). "How To Design Information Technology for Planned and Improvised Response: A Research Perspective." *International Association of Emergency Managers Bulletin*, 23(7) p. 30.

Gu, Q. and D. Mendonça (2004) "Group Information-seeking Behavior in Emergency Response: An Exploratory Study." *International Conference on Information Systems Workshop: Information Systems–Cognitive Research Exchange*, Washington, DC, 12 December.

Mendonça, D. and W. A. Wallace (2004). “Electric Power Restoration in Lower Manhattan after 11 September 2001.” Summary report to *The National Commission on Terrorist Attacks Upon the United States*, 28 June.

Mendonça, D. (2003). “Decision Support for Improvisation: Prospects, Challenges and Opportunities.” *International Conference on Information Systems Workshop: Research Directions on Decision Support*, Seattle, WA, 14 December.

Wallace, W. A., J. Chow and D. Mendonça (2001). “Impact of the World Trade Center Disaster on Critical Infrastructure Interdependencies.” *Learning From Disasters: National Science Foundation Response And Opportunities For Future Research Workshop*, Institute for Civil Infrastructure Systems, New York University, New York, NY, 12–13 December.

GRANTS

GRANTS AWARDED

PI: W. Gray. Co-PI: D. Mendonça. “Bad Choices!! Using Big, Long, and Multivariate Data to Explore Blunders Made by Teams and Individuals, Experts and Novices in Dynamic Skilled Performances.” Office of Naval Research Award N00014-17-1-2943, 1 September 2017–31 August 2020. \$760,000.

PI: D. Mendonça, Co-PI: M. Grabowski. “Linking Team Fluidity to Organizational Performance in Team-Centric Organizations,” National Science Foundation Grant 1363513, 15 July 2014–30 June 2018, \$376,988.

PI: D. Mendonça. “Community Response and Resilience to the 1755 Lisbon Earthquake,” National Science Foundation Grant IIA-1322548, 15 September 2013–31 August 2014, \$35,916.

PI: D. Mendonça. “RAPID: Network Improvisation in Emergency Response: An Application to Debris Removal Operations,” National Science Foundation Grant CMMI-1313589, 15 December 2012–31 November 2013, \$49,999.

PI: D. Mendonça, Co-PIs: W.A. Wallace, B. Cutler. “Synthetic Environments for Investigating Organizational Resilience: An Application in Post-disaster Restoration of Critical Infrastructure Systems,” RPI Seed Grant, 1 January 2011–31 December 2012, \$80,000.

PI: U. Krogman; Co-PI: C. Andrews; Investigators: J. Amara, W. Huang, G. Kiss, G. Mainelis, D. Mendonça, M. Raman, R. Wener. “Self-sufficient Urban Buildings,” National Science Foundation Grant BES-0725503, 1 September 2007–31 August 2012, \$1,813,112.

PI: D. Mendonça, Co-PIs: C. Butts, G. Webb. “Agents of Change: Improvisation in Emergency Response: Linking Cognition, Behavior and Social Interaction,” National Science Foundation Grant CMS-0624257, 1 October 2006–30 September 2010, \$710,000.

PI: D. Mendonça. “CAREER: Improvisation in Response to Extreme Events.” National Science Foundation Grant CMS-0449582, 15 January 2005–14 January 2010, \$400,000.

PI: M. Haselkorn; Co-PIs: R. Larson, D. Mendonça. “Humanitarian Service Science and Engineering Workshop,” National Science Foundation Grant CMMI-0738733, 1 July 2007–1 January 2008, \$44,230.

PI: D. Mendonça. “International Research and Education in Engineering: Improvisation in Response to Extreme Events,” National Science Foundation Grant CMS-0637118, 1 May 2006–31 August 2006, \$20,000.

PI: D. Mendonça. “Small Grant for Exploratory Research: Hurricane Katrina Debris Removal Operations: The Role of Communication and Computing Technologies,” National Science Foundation Grant CMS-0553080, 1 October 2005–30 September 2006, \$14,611.

PI: W. A. Wallace, Co-PIs: D. Mendonça, J. Mitchell. “Decision Technologies for Managing Critical Infrastructure Interdependencies.” National Science Foundation Grant CMS-0301661, 15 August 2003–31 January 2006, \$399,742.

PI: W. A. Wallace, Co-PIs: J. Chow, D. Mendonça. “Small Grant for Exploratory Research: Impact of the World Trade Center Disaster on Critical Infrastructure Interdependence.” National Science Foundation Grant CMS-0139306, 1 October 2001–30 September 2003, \$70,000.

OTHER RESEARCH ACTIVITIES

DOCTORAL THESIS ADVISEMENT

Principal thesis advisor for the following RPI students in Industrial and Systems Engineering:

- Eaton, J. *Role Improvisation and Leadership in Teamwork: A Big Data Perspective* (Expected completion in spring 2019)
- Renaud, M. *Individual Learning in Teamwork*. (Expected completion in spring 2019)
- Zhang, X. *Solution Assembly Processes in Team Improvisation* (expected completion in spring 2018)
- Brooks, J. *Dynamic Resource Allocation in Human Queueing Systems through Market-Based Control* (Completed, spring 2014).

Co-advisor for the following students:

- Korolov, Rostyslav, RPI Industrial and Systems Engineering Department, with W.A. Wallace. (Expected completion in spring 2018)
- Sangster, M. RPI Cognitive Science Department, with Wayne Gray. (Expected completion in spring 2019)
- Diirr, B. *Plan Adaptation in Unforeseen Situations*. Universidade Federal de Rio de Janeiro, with Marcos Borges. (Degree completed in spring 2017)

Principal thesis advisor for the following NJIT students:

- Chakrabarty, M. *Visualization and Visual Tools for the Management of Complex Systems* (completed, spring 2009).
- Chang, P. *Customer Cognition and Behavior in Online Shopping Environments* (completed, spring 2007)
- Lacontora, J. *Live, Virtual and Constructive Environments for Performance Support* (completed, spring 2004).

Thesis committee member for E. Kim, B. Ngugi, S. Sabet and X. Zhou (all NJIT); A. Adrot (Georgia State Univ.); J. Amaya, C. Gatti, R. Loggins, U. Mushtaque, Y. Tyshchuk (all RPI).

UNDERGRADUATE RESEARCH ADVISEMENT

At RPI

2017–present: Hanley Carter

2015-2017: On leave

2014-2015: Christian Pedroso, Courtney Lang, Sonia Kumar, Victor Muniz

2013-2014: Jason Chang, Kathleen DiMilia, Ron Nipay, Cintia Martins de Oliveira Reis, Daniel Souza.
2012-2013: Gabriele Cruz, Maira Kagohara, Olivia Von Nieda, Jon Sevilla
2011-2013: Jane Braun, Zal Mirza (SUNY), Christian Pedrosa

COLLABORATORS

G. E. G. Beroggi, J. Brooks, C. Butts, M. Chakrabarty, P. Chang, K. Chopra, J. Chow, B. Cutler, F. Fiedrich, W. Gray, Q. Gu, J. Harrald, A. Hendela, T. Jefferson, J. Lacontora, E. Lee, J. E. Mitchell, D. Peraza, M. Raghavachari, R. Rush, P. Stefan, D. van Gent, P. Venkataraman, W.A. Wallace, G. Webb, X. Yao.

TEACHING ACTIVITIES

COURSES DEVELOPED AND TAUGHT

Seminar in ISE Research (ISYE-6900): Required doctoral course in the practice of research (RPI).
Information Systems (ISYE-4530): Required undergraduate course in design, development and testing of database systems for decision support (RPI).
Human Performance Modeling and Support (ISYE 4961): Undergraduate course in cognitive task analysis, with applications to competitive sports (RPI).
Quantitative Methods in Information Systems Research (IS-768): Required doctoral course in conduct and quantitative analysis of empirical studies in the field of Information Systems (NJIT).
Multimedia Systems (IS-658): Graduate course in the design, implementation and evaluation of human-computer interfaces (NJIT).
Advanced Information Systems (IS-465): Required undergraduate course in information systems modeling and analysis (NJIT).
Geographic Information Systems (IS-441): Undergraduate course in the design of spatial databases and the analysis of spatial data (NJIT).

OTHER COURSES TAUGHT

Information Systems Principles (IS 677): core master's-level course in information systems design and evaluation (NJIT).
Multimedia Information Systems (IS 270): core undergraduate-level course in human-computer interface design (NJIT).
Introduction to Engineering Design (ENGR 2050): Required undergraduate course in multidisciplinary design (RPI).
Modeling and Analysis of Uncertainty (ENGR 20.260): Required undergraduate course in applied probability and statistics (RPI).

SERVICE AND AFFILIATIONS

NATIONAL SCIENCE FOUNDATION (2015–2017)

Program Director, Infrastructure Management and Extreme Events Program (now Humans, Disasters and the Built Environment), in NSF's Engineering Directorate. Responsible for \$4M annual budget, ongoing management of portfolio, community outreach and related activities, including redefining program scope and direction.
Program Officer. Critical Resilient Interdependent Infrastructure Systems and Processes Program; Smart and Connected Communities; Partnership for Innovation: Building Innovation Capacity. Duties included drafting solicitations, running panels, administering awards, and conducting outreach and related activities for roughly \$40M in multi-directorate programmatic funds.
Other NSF Activities: Member of various internal planning committees for cluster-, division-, directorate- and foundation-level initiatives; Member of multiple hiring committees for program director positions in the Engineering Directorate; Led two ad hoc programmatic efforts (Citizen Science&Engineering; Simulated and Synthetic Data for Infrastructure Modeling); Co-led

successful effort to define and establish a new program in Mind, Machine and Motor Nexus within the Engineering Directorate.

Other Federal Activities: Member, Subcommittee on Disaster Reduction; Member, Critical Infrastructure Security and Resilience Committee. Extensive collaborations (including joint funding) with US Dept. of Homeland Security.

CONFERENCES

Program Committee Member (2015). *IEEE International Conference on Systems, Man and Cybernetics*. Hong Kong.

Co-chair (with J. Dugdale) Program Committee, *Information Systems for Crisis Response and Management Conference*, Lisbon, Portugal, 8–11 May 2011.

Program Committee Member, *Information Systems for Crisis Response and Management Conference*, 2004, 2006, 2008, 2009.

Track Chair (2009), “Homeland Security.” *IEEE International Conference on Systems, Man and Cybernetics*, San Antonio, TX.

Track Chair (2006–2009, annually), “Research Methods in Crisis Decision Making and Decision Support Systems.” *Information Systems for Crisis Response and Management Conference*.

Panel Chair (2005), Improvised Thought, Behavior and Structure in Emergency Response. *Natural Hazards Workshop*, Boulder, CO.

Track Co-Chair (2004), "Interdependent Critical Infrastructure Systems" (with W. A. Wallace). *IEEE International Conference on Systems, Man and Cybernetics*, The Hague, The Netherlands.

WORKSHOPS

Participant, “INFORMS Academic Leadership Workshop,” INFORMS Annual Meeting, Houston, TX, 21 October 2017.

Co-organizer (with Fred Roberts), “DIMACS/CCICADA Science and Technology Innovations and Applications in Hurricane Sandy Research.” 21-22 October 2014, Rutgers University, Piscataway, NJ.

Member, Program Committee, “Complex Events and Information Modeling.” 7-10 September 2014, Warsaw, Poland.

Co-organizer (with F. Roberts), “DIMACS/CCICADA Workshop on Science and Technology Innovations in Hurricane Sandy Research.” 5 June 2013, Rutgers University, Piscataway, NJ.

Participant, “Technology, Tools, and CONOPs for Extreme Scale Disasters,” 29-30 June 2010, Massachusetts Institute of Technology/DARPA, Dedham, MA.

Participant, “National Earthquake Resilience: Research, Implementation, and Outreach,” National Research Council workshop, Irvine, CA, 17–18 August 2009.

Participant, “Security: Advancing a Framework for Enquiries,” Joint NATO/US National Science Foundation/European Science Foundation workshop, Paris, France, 17–18 November 2008.

Co-organizer (with W. Bouwman), “Workshop on Defining an Agenda for Research on Information and Communication Technology in Crisis Management,” Delft, The Netherlands, 5–6 November 2007.

Participant, “Decision Modeling and Behavior in Uncertain and Complex Environments,” Air Force Office of Scientific Research workshop, University of Arizona, Tucson, 28 February – 1 March 2008.

Co-organizer (with M. Haselkorn and R. Larson), "Humanitarian Service Science and Engineering Workshop," Seattle, Washington, 8 October 2007.

Participant, “Research & Education for Humanitarian Action Systems,” National Science Foundation Planning Meeting, Washington, DC, 26 January 2007.

Participant, “National Science Foundation Workshop on Resilient & Sustainable Infrastructures,” 4–5 December 2006.

Participant, “Unified Data Collection,” American Lifelines Alliance workshop, Washington, DC, 11–12 October 2006.

Participant, Workshop on the Use of Information Technology to Enhance Crisis Management of Natural and Manmade Disasters, National Research Council. Washington, DC, 22–23 June 2005.

Participant, *The First Annual Conference on Infrastructure Priorities: A National Infrastructure Research Agenda*, Academy for Educational Development, Washington, DC, 24–26 October 2001.

EDITORIAL AND RELATED ACTIVITIES

Member: *IEEE Systems, Man and Cybernetics Conference Committee* (2015–present).

Associate Editor: *IEEE Transactions on Human-Machine Systems* (2013–2016).

Co-chair: Technical Committee on Homeland Security, *IEEE Systems, Man and Cybernetics* (2015–2017, Member 2013–2014).

Member of Editorial Board: *Journal of Contingencies and Crisis Management* (2008–present), *International Journal of Emergency Management* (2001–present); *Infrastructure Complexity* (2013–2016).

Guest Editor: *International Journal of Emergency Management*, 5(1/2), “Research Methods in Emergency Management” (with B. Van de Walle); *Natural Hazards Review*.

Reviewer (Journals): *Computational Mathematical and Organization Theory*; *Creativity and Innovation Management*; *Decision Support Systems*; *Earthquake Spectra*; *Electronic Markets*; *Ergonomics*; *EURO Journal on Decision Processes*; *European Journal of Industrial Engineering*; *IEEE Systems, Man and Cybernetics Part A*; *Information, Knowledge, and Systems Management*; *International Journal of Mass Emergencies and Disasters*; *Journal of Homeland Security and Emergency Management*; *Journal of Infrastructure Systems*; *Journal of Organizational Computing and Electronic Commerce*; *Journal of Policy Analysis and Management*; *Knowledge and Information Systems*; *Logistics Information Management: an International Journal*; *MIS Quarterly*; *Natural Hazards Review*; *Policy Sciences*; *Public Administration*; *Safety Science*; *Structural Safety*; *Theoretical Issues in Ergonomics Science*.

Reviewer (Conferences): *Americas Conference on Information Systems*; *Cognitive Science Society Annual Meeting*; *Computer-Human Interaction*; *Hawaii International Conference on Systems Science*;

Human Factors and Ergonomics Society Annual Conference; International Conference on Information Systems; IEEE International Conference on Systems, Man and Cybernetics; Information Systems for Crisis Response and Management Conference.

UNIVERSITY COMMITTEES

- School of Engineering Diversity Scholarship/Fellowship Award, RPI (Fall 2017–)
- School of Engineering Faculty Excellence Awards Committee, RPI (Spring 2015)
- Dean Search Committee, College of Computing Sciences, NJIT (Spring 2005)
- International Relations Committee, NJIT (Fall 2003–Spring 2008)
- Teaching Learning and Technology Committee, NJIT (Spring 2003–Spring 2004)
- Albert Dorman Honors College Colloquium Committee, NJIT (Fall 2002–Fall 2003)

DEPARTMENT COMMITTEES AND ASSIGNMENTS

- Undergraduate Program Committee, , Department of Industrial and Systems Engineering, RPI (Fall 2017–present).
- Class of 2018 Undergraduate Advisor, , Department of Industrial and Systems Engineering, RPI (Fall 2017–Spring 2018).
- Faculty Hiring Committee, Department of Industrial and Systems Engineering, RPI (Fall 2013–Spring 2015)
- Promotion and Tenure Committee, Department of Industrial and Systems Engineering, RPI (Fall 2010–Spring 2015)
- Graduate Program Director, Department of Industrial and Systems Engineering, RPI (Fall 2011–Spring 2015)
- Ph.D. Committee, NJIT (Fall 2005–Spring 2010)
- Faculty Hiring Committee, NJIT (Fall 2003–Spring 2005)
- Excellence in Teaching Committee, NJIT (Fall 2003–Spring 2004)

PRESENTATIONS AND OTHER ACTIVITIES

Presentations

“Teamwork in e-Sports: Evidence from League of Legends.” INFORMS Annual Meeting, Houston, TX, 24 October 2017.

“Effective Proposal Writing from the Inside Out.” *Multiple locations*: School of Mechanical, Industrial, and Manufacturing Engineering, University of Oregon, 3 October 2017; Cognitive Science Department, RPI, 15 November 2017; Industrial and Systems Engineering Department, RPI, 29 November 2017.

“Infrastructure Management and Extreme Events: Program Overview.” NSF outreach talk, presented at multiple locations, 2015–2017.

“Cognitive Strategies in Collaborative Improvisation.” Seminar on Interdisciplinary Research and Education in Nuclear Emergency Response (SIREN), 7 April 2016, Virginia Tech, Arlington, VA,

“Network Improvisation in Emergency Response: An Application to Debris Removal Operations.” Science and Technology Innovations and Applications in Hurricane Sandy Research, October 21-22, 2014, Rutgers University, Piscataway, NJ.

“Collective Behavior in Queueing Networks: The Case of Post-disaster Debris Removal Operations.” Keynote presentation, 17th Annual Brazilian Ergonomics Conference (ABERGO), 16 September 2014, Universidade Federal de São Carlos, São Carlos, Brazil.

“Collective Behavior in Queueing Networks: The Case of Post-disaster Debris Removal Operations.” Invited Presentation, MIT Collective Intelligence Conference, 12 June 2014, MIT, Cambridge, MA.

“Collaborative Improvisation: Insights from Emergency Response and Jazz Performance.” *The Industrial and Systems Engineering Research Conference*, 31 May-3 June 2014, Montreal, Canada.

“An Exploration of Temporal Trends in Team Composition Performance Effects.” *The Industrial and Systems Engineering Research Conference*, 31 May-3 June 2014, Montreal, Canada.

“Team Fluidity and Performance in Large-scale Debris Removal Operations.” University of Lisbon, Lisbon, Portugal, 8 January 2014.

“Team Fluidity and Performance in Large-scale Debris Removal Operations.” National Civil Engineering Laboratory, Lisbon, Portugal, 13 May 2012.

“Team Fluidity and Performance in Large-scale Debris Removal Operations.” Department of Civil and Environmental Engineering, Rensselaer Polytechnic Institute, 22 February 2012.

“Synthetic Environments for the Study of Group Decision Making.” U.S. Military Academy at West Point, Center for Enhanced Human Performance, 2 February 2012.

“Collaborative Information Foraging in Emergency Response Organizations: An Application Involving Synthetic Environments.” Indiana University/Purdue University at Indianapolis, 18 November 2011.

“Validation in Agent-based Simulation: Applications in Post-disaster Restoration of Critical Infrastructure Systems,” Rockefeller College of Public Affairs and Policy, Albany, NY, 20 January 2011.

Keynote Speaker, “Validation in Agent-based Simulation: Applications in Post-disaster Restoration of Critical Infrastructure Systems,” National Symposium on Technology and Methodology for Security and Crisis Management, Linköping, Sweden, 28 October 2010.

“Finite State Machines Versus Infinite Human Creativity: Wedging Computer-Based Simulations into Studies of Group Improvisation,” Panel Presentation, Human Factors and Ergonomics Society Annual Conference, 28 September 2010.

“Risk Management in Civil Engineering: Advanced Course,” National Civil Engineering Laboratory, Lisbon, Portugal, 19 November 2008.

“Emergent Interoperability: Collaborative Adhocracies and Mix and Match Technologies in Emergency Management.” *Computer-supported Cooperative Work Conference*, Banff, Alberta, Canada, 7 November 2006.

“Adaptive Capacity: Electric Power Restoration in New York City following the September 11, 2001 Attacks.” School of Business, State University of New York at Buffalo, NY, 6 October 2006.

“Adaptive Capacity: Electric Power Restoration in New York City following the September 11, 2001 Attacks.” School of Business, University of Western Ontario, London, Ontario, 4 October 2006.

“A Cognitive Model of Improvisation in Emergency Management.” Department of Software Engineering, Monmouth University, NJ, and Signal Processing/Circuit and System Chapter of the IEEE New Jersey Coast Section, Long Branch, NJ, 27 April 2006.

"Impact of the 2001 World Trade Center Attack on Critical Infrastructure Interdependencies." Consolidated Edison Inc., New York, NY, 22 November 2002.

"Impact of the 2001 World Trade Center Attack on Critical Infrastructure Interdependencies." Public Service Enterprise Group Security Council, Newark, NJ, 19 November 2002.

“Impact of the 2001 World Trade Center Attack on Critical Infrastructure Interdependencies.” Construction Management Department, University of Karlsruhe, Karlsruhe, Germany, 19 August 2002.

“A Methodology for Investigating Organizationally-situated Improvisation in Emergency Response.” Disaster Research Center, University of Delaware, Newark, DE, 1 February 2002.

Other Related Activities

Faculty Mentor. "Enabling the Next Generation of Hazard Researchers," National Science Foundation grant 1424075 (PIs: D. Thomas, B. Gerber, and S. Brody), 2014–2016.

Panelist. National Academies of Science/National Cooperative Highway Research Program (NCHRP) Project 20-59(37), “Debris Management Handbook for State and Local DOTs.” 2011–2013.

Participant. FEMA/USACE Senior Leaders Seminar, Arlington, VA, 12 April 2011.

Faculty Mentor. "Enabling the Next Generation of Hazard Researchers," National Science Foundation grant 0758484 (PI: Thomas Birkland), 2008–2013.

Mentor, ISCRAM/TIEMS 2006 Summer School, Tilburg University, The Netherlands, 15 June 2006.

Member of Advisory Board, “Special Interest Group: Decision Support Systems Workshop,” *International Conference on Information Systems*, Milwaukee, WI, 10–13 December 2006.

International Advisory Committee Member, *First International Conference on Knowledge, Information and Creativity Support Systems.* Ayutthaya, Thailand, 1–4 August 2006.

Mentor, Ronald E. McNair Post-baccalaureate Achievement Program, New Jersey Institute of Technology, 2001–2009.

MEMBERSHIPS

- *Senior Member.* Institute of Electrical and Electronics Engineers (IEEE).
- *Member.* Cognitive Science Society, Human Factors and Ergonomics Society, Institute for Operations Research and Management Science (INFORMS).

LANGUAGES

English (native), Portuguese (fluent)