BIOGRAPHICAL SKETCH AND PROFESSIONAL ACTIVITIES

DAVID MENDONÇA

DEPARTMENT OF INDUSTRIAL AND SYSTEMS ENGINEERING
RENSSELAER POLYTECHNIC INSTITUTE

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I. Rank and Educational Preparation

Name: David Mendonça
Current Rank: Associate Professor
Department: Industrial&Systems Engineering
School: Engineering

Educational Preparation

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

II. Professional Experience

Main Appointments

2010– *Associate Professor*, Industrial and Systems Engineering Department, Rensselaer Polytechnic Institute, Troy, NY.

2006–2010 *Associate Professor*, Information Systems Department, College of Computing, New Jersey Institute of Technology, Newark, NJ.

2001–2006 *Assistant Professor*, Information Systems Department, College of Computing, New Jersey Institute of Technology, Newark, NJ.

National Science Foundation

2015–2017 *Program Director*, Humans, Disasters and the Built Environment 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.

Courtesy and Visiting 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.

1999 *Visiting Scholar*, Faculty of Technology, Policy and Management, Delft University of Technology, Delft, The Netherlands.

III. Teaching

*Since arriving at RPI, I have taught five distinct undergraduate **courses** (one of which I created, two of which I substantially revised) and one graduate course. My average teacher rating across all regular RPI classes is 4.0 out of 5. I have also taught numerous undergraduate- and graduate-level independent study courses. Prior to joining RPI, I taught and developed courses in the Management of Information Systems, Geographic Information Systems, Database Systems, Human-Computer Interaction and Quantitative Methods at New Jersey Institute of Technology (mean rating 2.9/4). I have directly **advised** a total of 19 undergraduate students (15 at RPI, including one journal article co-author and one prize-winner) and 6 doctoral students (4 at RPI, including one prize-winner), co-advised 4 other doctoral students (3 while at RPI), served as a member of 11 doctoral committees (6 at RPI), and advised 4 other graduate students on shorter-term projects (one at RPI). Finally, through service activities discussed in Sect.VII, I have contributed to curriculum development by serving as co-chair of the School of Engineering's Data Dexterity Task Force and by leading the development of ISE's university-wide minor in Data Science and Engineering.*

A. Course Development

At RPI

1. Minor in *Data Science and Engineering*. Approved spring 2019; offered beginning fall 2019. Led the development of this Institute-wide minor for ISE.
2. *Decision-focused Systems Engineering* (ISYE 4280). Elective undergraduate course in Decision Analysis. Redesigned existing course.
3. *Information Systems* (ISYE-4530): Required undergraduate course in design, development and testing of database systems for decision support. Redesigned existing course.
4. *Human Performance Modeling and Support* (ISYE 4961): Elective undergraduate course in cognitive task analysis. Completely developed course.
5. *Seminar on ISYE Research* (ISYE-6900): Required doctoral course in the practice of research in Industrial and Systems Engineering. Completely redeveloped existing course.
6. *Group Decision and Cognition* (ISYE-6960/COGS-6962): Readings-based seminar on cognitive underpinnings of group decision making. Completely developed course.

At NJIT

1. *Geographic Information Systems* (IS-441): Elective undergraduate course in the design of spatial databases and the analysis of spatial data. Completely developed course.
2. *Advanced Information Systems* (IS-465): Required undergraduate course in Information Systems modeling and analysis. Completely redeveloped course.
3. *Multimedia Systems* (IS-658): Elective graduate course in the design, implementation and evaluation of human-computer interfaces. Completely redeveloped face-to-face and online versions of the course.
4. *Quantitative Methods in Information Systems Research* (IS-768): Required doctoral course in quantitative analysis. Completely developed course.

B. Courses Taught

At RPI

Notes:

- ‡ **Scale**: 1 = Strongly Disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly Agree
- With exception of ISYE-6900, evaluation statistics only provided by RPI if sufficient number of respondents
- * = Credit varies by student

Year	*Semester*	*Course#*	*Course Title*	*Credits*	*#Students*	*Instructor Excellent?‡*
2019	Spring	ISYE-1100	Intro. to ISYE	1	26	4.7
2019	Spring	ISYE-4230	Quality Control	3	21	4.4
2019	Spring	ISYE-4940	Human Perf. Modeling in Hockey	3	1	-
2019	Spring	ISYE-6940	Emerg. Response Decision Making	3	1	-
2019	Spring	ISYE-9990	Dissertation	*	3	-
2018	Fall	ISYE-1100	Intro. to ISYE	1	25	4.9
2018	Fall	ISYE-4260	Human Perf. Modeling & Support	3	13	3.8
2018	Fall	ISYE-9990	Dissertation	*	3	-
2018	Summer	ISYE-9990	Dissertation	*	1	-
2018	Spring	ISYE-4280	Decision Focused Systems Engr.	3	10	4.5
2018	Spring	ISYE-9990	Dissertation	*	2	-
2017	Fall	ISYE-4260	Human Perf. Modeling & Support	3	22	3.5
2017	Fall	ISYE-6940	Human Perf. Modeling & Support	3	1	-
2017	Fall	ISYE-9990	Dissertation	*	3	-
2017	Summer	ISYE-6940	Fundamentals of Data Science	4	1	-
2017	Summer	ISYE-9990	Dissertation	*	1	-
2017	Spring	ISYE-6940	Query Optimization	4	1	-
2017	Spring	ISYE-9990	Dissertation	*	3	-
2016	Fall	ISYE-9990	Dissertation	*	3	-
2016	Spring	ISYE-9990	Dissertation	*	3	-
2015	Fall	ISYE-4941	Undergraduate Research	3	1	-
2015	Fall	ISYE-9990	Dissertation	*	2	-
2015	Spring	ISYE-4260	Human Perf. Modeling & Support	3	20	3.3
2015	Spring	ISYE-9990	Dissertation	*	1	-
2014	Fall	ISYE-4530	Information Systems	4	53	2.1
2014	Fall	ISYE-4941	1755 Lisbon Earthquake	3	1	-
2014	Fall	ISYE-6900	Seminar in ISYE Research	3	6	4.3
2014	Fall	ISYE-9990	Dissertation		4	-

continued on next page

At RPI

Notes:

- ‡ **Scale**: 1 = Strongly Disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly Agree
- With exception of ISYE-6900, evaluation statistics only provided by RPI if sufficient number of respondents
- * = Credit varies by student

Year	*Semester*	*Course#*	*Course Title*	*Credits*	*#Students*	*Instructor Excellent?‡*
2014	Spring	ENGR-2050	Intro. Engineering Design	4	28	3.8
2014	Spring	ISYE-6940	Team Cognition & Computation	3	1	-
2014	Spring	ISYE-9990	Dissertation	*	3	-
2013	Fall	ISYE-4260	Human Perf. Modeling & Support	3	26	3.8
2013	Fall	ISYE-4940	Readings in ISYE	1	1	-
2013	Fall	ISYE-6900	Seminar in ISYE Research	3	5	4.7
2013	Fall	ISYE-9990	Dissertation	*	6	-
2013	Spring	ISYE-4940	Comm. Resp. to 1755 Lisbon EQ.	3	2	-
2013	Spring	ISYE-4940	Improvisation in Extreme Events	2	1	-
2013	Spring	ISYE-4940	Readings in ISYE	3	1	-
2013	Spring	ISYE-9990	Dissertation		1	-
2012	Fall	ISYE-4260	Human Perf. Modeling & Support	3	33	4.4
2012	Fall	ISYE-4940	Research on Comm. Resilience	3	1	-
2012	Fall	ISYE-6900	Seminar in ISYE Research	3	2	-
2012	Fall	ISYE-9990	Dissertation		1	-
2012	Spring	COGS-6962	Group Decision & Cognition	3	2	-
2012	Spring	ISYE-4940	Readings in ISYE	3	1	-
2012	Spring	ISYE-6960	Group Decision & Cognition	3	3	-
2012	Spring	ISYE-9990	Dissertation		2	-
2011	Fall	ISYE-4961	Human Perf. Modeling & Support	3	14	4.1
2011	Fall	ISYE-6900	Seminar in ISYE Research	3	4	-
2011	Fall	ISYE-9990	Dissertation		4	-
2011	Spring	ISYE-6960	Research Methods in ISYE	3	3	-
2010	Fall	ISYE-4961	Human Perf. Modeling & Support	3	9	-

At NJIT

Notes:

- **Scale***:* 0 =Poor, 1 =Fair, 2 =Satisfactory, 3 =Good, 4 =Excellent
- * = Summary not available
- All courses three (3) credits

Year	*Semester*	*Course#*	*Course Title*	*Credits*	*#Students*	*Instructor Evaluation (out of 4)*
2010	Spring	IS-465	Advanced Information Systems	3	25	*
2010	Spring	IS-786	Quantitative Methods in Info. Sys. Research	3	8	*
2009	Fall	IS-677	Information Systems Principles	3	25	2.7
2009	Fall	IS-677	Information Systems Principles	3	10	2.9
2009	Spring	*Sabbatical*		3		
2008	Fall	*Sabbatical*		3		
2008	Spring	IS-465	Advanced Information Systems	3	25	2.4
2008	Spring	IS-677	Information Systems Principles	3	46	3.3
2007	Fall	IS-465	Advanced Information Systems	3	31	*
2007	Spring	IS-786	Quantitative Methods in Info. Sys. Research	3	6	3.1
2007	Spring	IS-465	Advanced Information Systems	3	26	2.7
2006	Fall	IS-677	Information Systems Principles	3	30	3.4
2006	Fall	IS-465	Advanced Information Systems	3	25	2.8
2006	Spring	*Research release*		-		
2005	Fall	IS-465	Advanced Information Systems	3	18	3.0
2005	Spring	IS-658	Multimedia Systems	3	18	3.3
2005	Spring	IS-786	Quantitative Methods in Info. Sys. Research	3	9	3.5
2004	Fall	IS-465	Advanced Information Systems	3	45	2.8
2004	Fall	IS-441	Geographic Information Systems	3	11	2.4
2004	Spring	IS-658	Multimedia Systems	3	26	2.6
2004	Spring	IS-465	Advanced Information Systems	3	38	1.9
2003	Fall	IS-441	Geographic Information Systems	3	19	2.8
2003	Fall	IS-465	Advanced Information Systems	3	32	3.2
2003	Spring	IS-786	Quantitative Methods in Info. Sys. Research	3	9	3.7
2003	Spring	IS-658	Multimedia Systems	3	18	2.9
2002	Fall	IS-441	Geographic Information Systems	3	19	3.0
2002	Spring	IS-270	Multimedia Information Systems	3	13	2.8
2001	Fall	IS-658	Multimedia Systems	3	15	3.3

C. Student Research Supervision

All projects for the noted academic year(s) unless otherwise indicated.

a. Bachelors

Summary: Undergraduate Research Advising at RPI

Academic Year	#Advisees
2018/2019	1
2017/2018	1
2016/2017	0 (on leave)
2015/2016	0 (on leave)
2014/2015	1
2013/2014	7
2012/2013	7
2011/2012	3
2010/2011	0

Note: total is for number of individuals.

At RPI: Primary research advisor to the following ISE undergraduate students:

15. Dong, Qi (Spring 2019): Collection and analysis of hockey gameplay data.

14. Carter, Hanley (2017–2018): Finalized an expanded data set from experiments with jazz musicians; conducted preliminary statistical analysis.

13. Pedroso, Christian (2011-2015): Collected and catalogued primary and secondary Portuguese-language materials for ongoing project on 1755 Lisbon Earthquake.

12. Chang, Jason (2013–2014): Content coding for NSF-funded project on Super Storm Sandy.

11. DiMilia, Kathleen (2013–2014): Secondary data collection and content coding for NSF-funded project on Super Storm Sandy.

10. Hsia, Caroline (2013–2014): Content coding for NSF-funded project on Super Storm Sandy and on emergency response decision making.

9. Nipay, Ron (2013–2014): Content coding for NSF-funded project on Super Storm Sandy.

8. Martins de Oliveira Reis, Cintia (2013–2014): Database and meta-data development for NSF-funded project on 1755 Lisbon Earthquake.

7. Souza, Daniel (2013–2014): Database and meta-data development for NSF-funded project on 1755 Lisbon Earthquake.

6. Braun, Jane (2011-2014): Content coding for project on cognition in emergency response decision making.

5. Mirza, Zal (State Univ. of NY/Binghampton) (2011-2013): Data preparation for further study on cognition in jazz improvisation.

4. Von Nieda, Olivia (2012-2013): Field work and simulation studies for NSF-funded project on Super Storm Sandy.

3. Cruz, Gabriele (2012-2013): Content coding for NSF-funded project on 1755 Lisbon Earthquake.

2. Sevilla, Jon (2012-2013): Database work on NSF-funded 1755 Lisbon Earthquake project.

1. Kagohara, Maíra (2012-2013): Content coding and analysis for NSF-funded project on 1755 Lisbon Earthquake.

At NJIT: Primary research advisor to the following Information Systems undergraduate students:

4. Calabrese, Louis (2001–2003). Collection and coding of newspaper reports on 9/11-related outages from critical infrastructures, supported by NSF.

3. Melo, Maria (2001-2002). Computer programming on interactive decision support system.

2. Rosales, Abraham (2004–2005). Content coding from simulated emergency response experiments, supported by NSF.

1. Elmalak, Uzman (2004-2005). Content coding from simulated emergency response experiments, supported by NSF.

Note: all dates approximate

b. Master's

At RPI: None.

At NJIT: Primary research advisor to the following Information Systems master's students:

3. Dharani, A. (2003–2004). Literature reviews for ontology validation project.

2. John, Manjula (2001–2002). Coding of newspaper report on 9/11-related outages from critical infrastructures, supported by NSF.

1. Venkataraman, Pushkala (2004–2005). Analysis and writing for ontology validation project.

Note: all dates approximate

c. Doctoral

Summary: Doctoral Student Advising at RPI

Academic Year	#Advisees Fall	#Advisees Spring
2018/2019	3	3
2017/2018	3	2
2016/2017	3	3
2015/2016	2	3
2014/2015	1	1
2013/2014	1	3
2012/2013	1	1
2011/2012	0	2
2010/2011	0	0

Note: Totals are for number of individuals, including advisees and co-advisees

RPI Graduated Ph.D. Student (Served as Chair)

1. Brooks, James. *Dynamic Resource Allocation in Human Queueing Systems through Market-Based Control*. Decision Sciences and Engineering Systems (ISE) Ph.D. awarded in Spring 2014. Current position: Senior Researcher, General Electric Research and Development.

RPI Graduated Ph.D. Student (Served as Co-chair)

2. Korolov, Rostyslav. *Predicting Social Protest through Social Media*. Co-advised with W.A. Wallace. Decision Sciences and Engineering Systems (ISE) Ph.D. awarded in Fall 2018. Current position: Lecturer, RPI.

Federal University of Rio de Janeiro (Brazil), Graduated Ph.D. Student (Served as Co-chair)

3. Diirr, Bruna. *Plan Adaptation in Unforeseen Situations*. Co-advised with Marcos Borges, Computer Science, Federal University of Rio de Janeiro. Information Science Ph.D. awarded in Spring 2016. Current position: Postdoctoral Associate, Federal University of Rio de Janeiro.

RPI Current Ph.D. Students (Serving as Chair):

4. Dipietrantonio, Josef (2018–). *Synthetic Environments for Modeling Performance: An Application in e-Sports*. Decision Sciences and Engineering Systems (ISE) Ph.D. student. Doctoral qualifying exam under review. Expected completion in Spring 2022.

5. Zhang, Xin (2014–). *Behavioral Responses to Surprise in Multi-level, Team-centric Organizations: The Case of Post-disaster Debris Removal Operations*. Decision Sciences and Engineering Systems (ISE) Ph.D. student. Passed candidacy fall 2018. Expected completion Fall 2019.

6. Eaton, Joshua (2016–). *Linking Adaptation Processes to Team Performance in High-tempo, High-stakes Teamwork: A Large-scale Gaming Perspective*. Decision Sciences and Engineering Systems (ISE) Ph.D. student. Co-advised with Wayne Gray, RPI Cognitive Science. Passed candidacy Fall 2018. Expected completion Summer 2019.

RPI Current Ph.D. Student (Serving as Co-chair):

7. Sangster, Matthew (2016–). *The Sum of Its Parts: A Three Part Framework for Developing Models of Individual Performance in the Context of a Team*. Cognitive Science Ph.D. student, co-advised with Wayne Gray. Passed candidacy Spring 2019. Expected completion Summer 2019.

NJIT Graduated Ph.D. Students (Served as Chair)

8. Chakrabarty, Madhavi. *Visualization and Visual Tools for the Management of Complex Systems*. Information Systems Ph.D. awarded in Spring 2009. Current position: Assistant Professor of Professional Practice, Rutgers Univ.

9. Chang, Peishih. *Customer Cognition and Behavior in Online Shopping Environments*. Information Systems Ph.D. awarded in Spring 2007. Current position: Senior Data Architect, Citi, Inc.

NJIT Graduated Ph.D. Students (served as co-chair)

10. Lacontora, John. *Live, Virtual and Constructive Environments for Performance Support.* Co-advised with F. Deek. Information Systems Ph.D. awarded in Spring 2005. Current position: Associate Research Professor, Drexel Univ.

RPI Supervision of Graduate Independent Research

11. Narkar, Shwetha (Spring2019–Summer 2019), Ph.D. student in Information Technology and Web Services (P. Fox, advisor). Independent research on data analysis for study of cognition in emergency response decision making.

D. Doctoral Committee Participation

1. Rowen, Aaron (RPI, ISE), passed candidacy Spring 2018.
2. Mushtaque, Uzma (RPI, ISE), completed 2017.
3. Amaya, Joana (RPI, CEE), completed 2016.
4. Gatti, Chris (RPI, ISE), completed 2016.
5. Loggins, Ryan (RPI, ISE), completed 2016.
6. Tyshchuk, Yulia (RPI, ISE), completed 2014.
7. Adrot, Anouk (Paris-Dauphine University [Management] and Georgia State University [Computer and Information Systems]), completed 2010.
8. Sabet, Samuel (NJIT, Information Systems), completed 2006.
9. Roychoudhury, S. (NJIT, Mathematics), completed 2006.
10. Kim, Eunhee (NJIT, Information Systems), completed 2004.
11. Ngugi, Benjamin (NJIT, Information Systems), completed 2004.

IV. Publications

My research has resulted in 65 total publications in refereed outlets (8 book chapters, 23 journal publications, 34 conference publications). My current Google Scholar h-index is 18. Since arriving at RPI, my journal and conference publications have been almost exclusively co-authored with my students (i.e., all journal publications but one, and all conference publications). Section V.F discusses the areas to which this research has contributed.

- Google Scholar: https://scholar.google.com/citations?user=iCxtrGUAAAAJ&hl=en
- ORCID: 0000-0001-8070-0960
- Web of Science ResearcherID: K-9609-2019

Notes for all listed publications:
- Student authors are underlined.
- * denotes graduate student advised by Mendonça
- ‡ denotes graduate student co-advised by Mendonça
- † denotes undergraduate student advised by Mendonça

A. Book Chapters: Full-length Peer-reviewed

8. Mendonça, D. (2014). "Sensor-driven Discovery of Resilient Performance: The Case of Debris Removal at Ground Zero, NYC, 2001," in *Resilience Engineering in Practice (vol. 2)*, C. Nemeth and E. Hollnagel (eds.), Ashgate Publishing Ltd., Aldershot, England, Ch. 11 (22 pages).

7. Mendonça, D. and Y. Hu* (2009). "Cognitive Underpinnings of Resilience: A Case Study of Group Decision in Emergency Response," in *Resilience Engineering Perspectives (vol. 2)*. C. Nemeth (Ed.). Ashgate Publishing Ltd., Aldershot, England, 179–204.

6. 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, Dordrecht, 55–76.

5. 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, 29–47.

4. 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 and Applications Information Center, University of Colorado, Boulder, CO, 283–304.

3. 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, University of Colorado, Boulder, CO, 165–198.

2. 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, 263–289.

1. 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, 293–326.

B. Book Chapters: Short-form Peer-reviewed

4. Mendonça, D. and J. Brooks* (2013). "Debris Management" in *Sage Encyclopedia of Crisis Management (vol. 1)*, K.B. Penuel, M. Statler and R. Hagen (Eds.), Thousand Oaks, CA, 239–240.

3. Mendonça, D. and Z. Franco (2013). "Improvising" in *Sage Encyclopedia of Crisis Management.* in *Sage Handbook of Crisis Management (vol. 1)*, K.B. Penuel, M. Statler and R. Hagen (Eds.), Thousand Oaks, CA, 495–498.

2. Mendonça, D. and M. Pfaff (2013). "Crisis Simulations" in *Sage Encyclopedia of Crisis Management (vol. 1)*, K.B. Penuel, M. Statler and R. Hagen (Eds.), Thousand Oaks, CA, 200–202.

1. Mendonça, D. (2013). "Engaging in Cognitive Novelty" in *Sage Encyclopedia of Crisis Management (vol. 1)*, K.B. Penuel, M. Statler and R. Hagen (Eds.), Thousand Oaks, CA, 139–140.

C. Journal Articles

a. Articles in Refereed Journals[§]

23. Eaton, J.* and D. Mendonça (in press). "Linking Adaptation Processes to Team Performance in High-tempo, High-stakes Teamwork: A Large-scale Gaming Perspective." *Theoretical Issues in Ergonomics Science*. DOI 10.1080/1463922X.2019.1594444. (*Impact Factor:* N/A)

22. Brooks, J.*, D. Mendonça and X. Zhang* (in press). "Efficacy of Incentive Structures for Boundedly-rational Schedulers in Large-scale Queueing Networks." *IEEE Transactions in Human-Machine Systems*. DOI 10.1109/THMS.2019.2906618. (*Impact Factor:* 3.332)

21. Mendonça, D., I. Amorim and M. Karohara† (2019). "Historical Perspectives on Community Resilience: The Case of the 1755 Lisbon Earthquake." *International Journal of Disaster Risk Reduction* 34 (March) 363-374. (*Impact Factor:* 2.568)

20. Brooks, J.*, K. Kar and D. Mendonça (2016). "Allocation of Flows in Closed Bipartite Queueing Networks." *European Journal of Operational Research* 255(2) 333-344. (*Impact Factor:* 3.806)

19. 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. (*Impact Factor:* 4.139)

18. 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. (*Impact Factor:* 0.757)

17. 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

[§] Impact Factors are as reported by Clarivate Analytics (2019) where available.

Trade Center." *Journal of Contingencies and Crisis Management* 22(4) 185-195. (*Impact Factor:* 1.365)

16. Mendonça, D., J. Brooks* and 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. (*Impact Factor:* 3.332)

15. Osatuyi, B.* and D. Mendonça (2013). "Temporal Modeling of Group Information Foraging: An Application to Emergency Response." *Information Processing and Management* 49(1) 169-178. (*Impact Factor:* 3.892)

14. Mendonça, D., P. Chang*, Y. Hu* and 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. (*Impact Factor:* 1.435)

13. 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) 41–51. (*Impact Factor:* N/A)

12. Mendonça, D., G. Webb and 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 C. Blondelot and M. Lenormand, *Tracés: Revue de Sciences Humaines*, 18, 69–86. (*Impact Factor:* N/A)

11. 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. (*Impact Factor:* N/A)

10. 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. (*Impact Factor:* 5.410)

9. Mendonça, D. and W.A. Wallace (2007). "A Cognitive Model of Improvisation in Emergency Management." *IEEE Transactions on Systems, Man and Cybernetics: Part A: Systems and Humans* 37(4) 547 - 561. (renamed *SMC:THMS* in 2012 with *Impact Factor:* 3.332)

8. Mendonça, D. (2007). "Decision Support for Improvisation in Response to Extreme Events." *Decision Support Systems* 43(3) 952–967. (*Impact Factor:* 3.847)

7. 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. (*Impact Factor:* 1.539)

6. 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. (*Impact Factor:* N/A)

5. 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. (*Impact Factor (2017):* 2.835)

4. 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. (*Impact Factor:* N/A)

3. 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. (*Impact Factor:* N/A)

2. 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. (*Impact Factor:* 3.806)

1. 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. (*Impact Factor (2017):* 2.835)

b. Articles under Review

R1. Baptista dos Santos França, J., M. Borges and D. Mendonça. "Systematizing the Collaborative Impacts Projection of Complex Decisions in Work Groups." Under review at *Cognition, Technology and Work.*

c. Articles in Preparation

P4. Diir, B.‡, M. Borges and D. Mendonça. "Supporting Plan Adaptation in Unforeseen Situations." In preparation.

P3. DiPietrantonio, J.* and D. Mendonça. "Opening the Black Box of Team Performance with Open-source Games: A Review and Recommendations." In preparation.

P2. Chakrabarty, M.* and D. Mendonça. "Search with Informationally Equivalent, Visually Different Diagrams." In preparation.

P1. Cheng, L.* and D. Mendonça. "Computational Modelling of Improvisation: A Review and Synthesis." In preparation.

D. Conference Proceedings

a. Peer-reviewed Full-length Articles

34. Eaton, J.A.* and D. Mendonça (in press). "Inputs, Mediators, and Outcomes: Testing an Integrated Team Effectiveness Framework in League of Legends." Accepted for *Human Factors and Ergonomics Society Annual Meeting*, Seattle, WA, 28 October–1 November 2019.

33. Renaud M.*, *Korolov R.‡*, Mendonça D. and Wallace W.A. (2019). "Social Network Structure as a Predictor of Social Behavior: The Case of Protest in the 2016 US Presidential Election." In: O. Chertov , T. Mylovanov, Y. Kondratenko, J. Kacprzyk, V. Kreinovich and V. Stefanuk (eds.), *Recent Developments in Data Science and Intelligent Analysis of Information*. International Conference on Data Science and Intelligent Analysis of Information 2018. Advances in Intelligent Systems and Computing, v. 836. Springer, Cham, Switzerland.

32. Eaton, J.*, D. Mendonça and W. Gray (2018). "Attack, Damage and Carry: Role Familiarity and Team Performance in League of Legends." *Human Factors and Ergonomics Society Annual Meeting*, Philadelphia, PA, 1-5 October.

31. Eaton, J.*, M. Renaud*, M. Sangster*, D. Mendonça and W. Gray (2017). "Carrying the Team: The Importance of One Player's Survival for Team Success in League of Legends." *Human Factors and Ergonomics Society Annual Meeting*, Austin, TX, 9-13 October.

30. Zhang, X.*, D. Mendonça, M. Grabowski and C. Holmes (2017). "Improvising Organizational Structure and Process: The Case of Post-disaster Debris Removal Operations." *Human Factors and Ergonomics Society Annual Meeting*, Austin, TX, 9-13 October.

29. Sangster, M-D.‡, D. Mendonça and W.D. Gray (2016). "Big Data Meets Team Expertise in a Dynamic Task Environment." *Human Factors and Ergonomics Society Annual Meeting*, Washington, DC, 19-23 September.

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

27. Zhang, X.* and D. Mendonça (2015). "Predicting Group Decisions Based on Group Information Seeking and Assembly Behavior." *Human Factors and Ergonomics Society Annual Meeting,* Los Angeles, CA, 26-30 October.

26. Diirr, B.‡, M. Borges and D. Mendonça (2015). "Putting Plans on Track in Unforeseen Situations." *Information Systems for Crisis Response and Management Conference*, Kristiansand, Norway, 24-27 May.

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

24. Brooks, J.* and D. Mendonça (2014). "Equity-Effectiveness Tradeoffs in the Allocation of Flows in Closed Queueing Networks." *IEEE International Systems Conference*, Ottawa, ON, Canada, 31 March-3 April.

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

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

21. 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." *INGRoup Conference*, Chicago, IL, 12–14 July.

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

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

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

17. Mendonça, D. and W.A.G.A. Bouwman (2007). "Information and Communications Technology for Crisis Management: Defining an Agenda for Scientific Research." *Next Generation Infrastructures Conference*, Delft, The Netherlands, 4–6 November.

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

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

14. 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*, New York, NY, 20–24 April.

13. 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*, Brussels, Belgium, 18–20 April.

12. Chakrabarty, M.* and D. Mendonça (2004). "Design Considerations for Information Systems to Support Critical Infrastructure Management." *Information Systems for Crisis Response and Management Conference*, Brussels, Belgium, 18–20 April.

11. 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*, Boston, MA, 20–23 December.

10. 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*, The Hague, The Netherlands, 10–13 October.

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

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

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

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

5. 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*, Washington, DC, 5–8 October.

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

3. 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*, Big Island, HI, 6–9 January.

2. 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*, Big Island, HI, 7–10 January.

1. 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*, Delft, The Netherlands, 8–11 June.

b. Conference Proceedings: Full-length Invited Publications

5. Brooks, J.* and 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*, Savannah, GA, 7-10 December.

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

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.

2. 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*, The Hague, The Netherlands, 10–13 October.

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

E. Publications in Practitioner Outlets (Non-refereed)

3. Mendonça, D., C. Butts and G. Webb (2007). "Creativity and Improvisation after 19/4 and 11/9: Learning from the Response to Two Extreme Events." *Contingency Today*.

2. 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) 30.

1. 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.

V. Research Grants and Contracts

My research has been supported by the National Science Foundation and other sources since 2001. The total amount in Federal grants for which I have served as PI is approximately $1,607,500. Additionally, the amount of direct expenditures on Federal grants for which I have served as co-PI or Investigator is approximately $222,175. Since returning from leave at NSF, I have recommenced active submission of proposals as a PI. I currently have one active award from the Office of Naval Research (as Co-PI), one active NSF award for which I am sole PI (see Sect. V.G for a summary), and one NSF proposal for which I am sole PI and which is currently under review.

A. Proposal Pending

1. *PI*: D. Mendonça. "Methods and Models for Comparative Study of Community Resilience: The Case of the 1755 Lisbon Earthquake." National Science Foundation proposal 1945858. Role: PI. $398,655.

B. Proposals Approved and Funded by US Federal Agencies

a. Current and Active

13. *PI*: D. Mendonça. "EAGER: Operations and Systems Engineering Extreme Event Research (OSEEER)." National Science Foundation proposal 1936967. Role: PI. $299,854. Recommended for funding, 21 June 2019.

12. *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 Grant N00014-17-1-2943, 1 September 2017–31 August 2020, $731,149. Budgeted Effort for Mendonça: $25,000.

b. Completed

11. *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 2019, $376,988.

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

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

8. *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, $1,813,112, 1 September 2007–31 August 2012. Subaward to Mendonça: $46,862.

7. *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, $710,000, 1 October 2006–30 September 2010.

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

5. *PI*: M. Haselkorn; *Co-PIs*: R. Larson, D. Mendonça. "Humanitarian Service Science and Engineering Workshop." National Science Foundation Grant CMMI-0738733, $44,230, 1 July 2007–1 January 2008. All funds to support participant travel.

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

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

2. *PI*: W.A. Wallace, *Co-PI*s: D. Mendonça, J. Mitchell. "Decision Technologies for Managing Critical Infrastructure Interdependencies." National Science Foundation Grant CMS-0301661, 15 August 2003–31 January 2006, $414,742. Subaward to Mendonça: $125,375.

1. *PI*: W.A. Wallace, *Co-PI*s: 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. Subaward to Mendonça: $25,000.

C. Proposals Approved and Funded by Non-Federal Sources

5. PI: Bequette, W., Co-PIs: W. Gray, J. Malazita, D. Mendonça, R. Radke; Participant: Hui Su. "Using Cognitive Computing for the Manufacturing Control Room of the Future." RPI Knowledge Innovation Program, $80,000, 2019–2020.

4. RPI Presidential Fellowship awarded to Matthew Sangster, Ph.D. student in Cognitive Science advised by W. Gray and D. Mendonça, 2017–2018

3. RPI Presidential Fellowship awarded to Matthew Sangster, Ph.D. student in Cognitive Science advised by W. Gray and D. Mendonça, 2016–2017

2. *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, $80,000, 1 January 2011–31 December 2012.

1. *PI*: D. Mendonça. "Course Development: Geographic Information Systems." New Jersey Information Technology Opportunities for the Workforce, Education and Research, September 2000–May 2001.

D. Current Research Activities

My research explores human cognition and decision making in non-routine, often time-constrained situations. The emphasis of this work is on improving understanding of the antecedents, processes and consequences of improvisation, a type of real-time creativity found in many fields of human endeavor. My research approach entails detailed exploration of the task environment, human response to it, and the development of computer-based systems for supporting task performance. My research combines observations "in the wild" (i.e., in natural settings), archival study and experimental work in instrumented task environments. Much of this work is data-intensive, often involving the study of moment-to-moment human-machine interactions. It has led to insights on improvisation in human-machine systems, particularly in the domain of hazards and disasters, as well as to implications for supporting improvisation and related phenomena, such as adaptation and resilience. This research has involved extensive national and international collaborations with colleagues in industrial engineering, computer science, and cognitive science, as well as considerable interaction with practitioners in diverse domains, including emergency response, competitive sports and musical performance.

Methodologically and thematically, my research primarily spans the fields of Industrial Engineering and Computer Science, as reflected in the ISI citation analysis shown in Fig. 1, which depicts the distribution of citations to my work across various fields. As discussed below, my main methodological approaches are both qualitative and quantitative, ranging from content coding to experimentation and computer-based simulation. Thematically, my work addresses both decision making (often in the purview of Industrial Engineering) and interactive decision support systems (often in Computer Science and in Industrial Engineering).

Fig. 1: Distribution of Citations in ISI
(ISI Web of Knowledge: http://wcs.webofknowledge.com)

(1) Improvisation and Adaptation in Complex Task Environments

The vast bulk of my work concerns human decision making at or beyond the frontiers of human experience, and in particular in situations of urgency—where time given to planning for a decision is time taken away from implementing that decision. With NSF support during my doctoral studies, I conducted laboratory studies on cognition in *jazz improvisation* (see Fig. 1) in order to investigate the interaction between creativity and coordination in duos of professional musicians in the performance of different musical numbers [D.a.9].** The results suggest not only that cognition in jazz improvisation is extensive and

** Citations are to publications in Sect. IV, so that [D.a.9] is a citation to the following peer-reviewed, full-length conference publication: Mendonça, D. and W.A. Wallace (2004). "Cognition in Jazz Improvisation: An Exploratory Study." *Cognitive Science Society Annual Meeting*, Chicago, IL, 5–8 August.

sustained, but—as in more conventional and structured activities—that it is shared and explicitly controlled by players.

Fig. 2: Jazz Improvisation Study

Then as now, my abiding interests have been in the cognitive and behavioral processes that underlie improvisation, specifically as they relate to planning and executing actions in response to (or in anticipation of) non-routine or highly consequential events. The approach taken with the jazz musicians provided a template for the design of my subsequent laboratory work: present a group with a task requiring creativity under time constraint, record their actions as they unfold (along with the state of the task environment), and construct statistical or other models to attempt to infer the patterns of cognition that underlie decision making processes under different (experimental) conditions.

Close study of actual events in the field has been essential in sharpening questions and identifying theoretical, methodological and empirical gaps concerning improvisation and related phenomena such as adaptation. My work on **organizational improvisation during emergency response** has helped to expand theory, to inform and reify this theory with empirical observations, and to identify challenges for the measurement and support of decision making processes and performance.

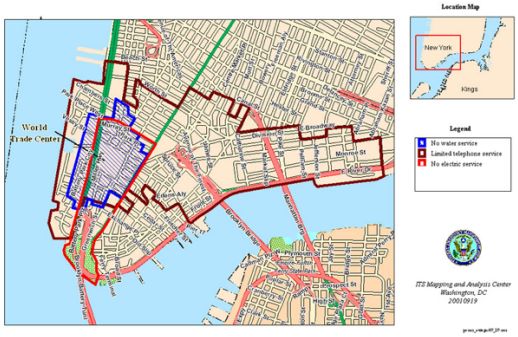

Fig. 3: 9/11 Service Outages

Fig. 4: Spot Power in NYC

I co-led two NSF-funded studies of the restoration of critical infrastructure (electric power, telecommunications, etc.) in New York City after the 11 September 2001 attacks. As is clear from my own work [A.3, C.a.(19,17,8)] and that of others, post-9/11 infrastructure restoration was an evolving, *ad hoc* process replete with improvisation. For example, my work on outages [C.a.7] and subsequent restoration of electric power (see Figs. 3 and 4) used a wide variety of data on the evolving configuration of the responding organization (Consolidated Edison) and its electric power distribution network to critique, measure and expand the set of factors thought to underlie organizational resilience [C.a.19]. Taken together, this body of work is probably my most highly cited. It has been presented extensively here and abroad, including in conference keynotes (see Sect. VIII), and a summary was requested by the 9/11 Commission [E.1]. This work has contributed to broader theories of organizational resilience and has yielded implications for decision support [C.a.10] taken up in my subsequent research.

Ultimately, organizational improvisation in disaster response is situated within broader organizational [C.a.4] and community contexts. My recent work addresses two longstanding challenges in building robust theories and methods for understanding how organizational and community capacity contributes to (or detracts from) **community resilience**. The first challenge is to measure and model community resilience over longer time scales, as opposed to how it is manifested in single events. The second, related challenge is to develop methods that can support comparisons of resilience across communities (e.g., in the developed vs. the developing worlds).

My test case for addressing these challenges is the 1755 Lisbon Earthquake–to date the largest earthquake in European recorded history. A country-wide (parish-level) survey on the event and community response to it was conducted approximately three months after the earthquake. My initial NSF-supported work involved data collection and preparation (with extensive involvement from RPI undergraduate students, including one co-author) and explored the implications of these survey results for the theory and measurement of community resilience [C.a.21]. This appears to be the first study in English using these data. I am currently preparing a larger NSF proposal for submission in late June 2019 which will investigate this topic further, to include longitudinal analysis of data from a country-wide survey which preceded the earthquake and another that followed it several years later.

Despite the long historical distance of this event (or perhaps because of it), I believe research along these lines will have strong methodological implications for studies of contemporary communities. For example, in "smart and connected communities," "Big Data" from a wide variety of sources may be used to attempt to understand sources of community resilience—but theoretical frameworks are necessary for situating that data appropriately, particularly in relation to the past. Indeed, and related to the challenge of comparative study discussed previously, technologies that enable or inhibit community resilience may change rapidly, heightening the need to understand their role in amplifying or dampening community resilience over time.

(2) System Perspectives on Team Composition and Performance

A recent line of research explores structural aspects of teamwork—particularly the effect on performance of changes in team composition [C.a.(23,16), D.a.(34,32,31]—together with the development of control-theoretic methods for managing the performance of team-based organizations [C.a.(22,20)]. This research addresses two perennial challenges in teamwork studies: first, it confronts the often prohibitively high costs associated with securing the participation of sufficient numbers of real teams; second, it uses naturally occurring, detailed and longitudinal data to address the inferential challenges associated with small sample studies [C.a.23]. Until recently, these challenges have severely limited opportunities for progress in the field.

Two ongoing projects illustrate my work in this area. The first, funded by NSF, explores the impact of changes in task demands, team composition, and incentive structures on the performance of post-disaster debris removal missions. Debris removal operations can be highly distributed (covering multiple states) and prolonged (lasting weeks to months)—making them difficult to monitor and control—and, as a result, expensive (sometimes costing hundreds of millions to billions of dollars). I have been involved in the debris domain since undertaking NSF-funded field work on the use of information technologies during debris removal after Hurricane Katrina [A.4], including through service activities (see Sect. VI.C). I undertook related studies on debris removal operations at Ground Zero after 9/11 [A.8, D.a.14] and in New York State after Super Storm Sandy [D.a.30]. This research has involved extensive cooperation and collaboration with state agencies (particularly New York State Department of Homeland Security and Emergency Services) and Federal agencies (including the US Army Corps of Engineers and the Federal Emergency Management Agency).

Following Hurricane Katrina, the experiences with waste, fraud and abuse with debris removal associated with that event led the Federal government to consider technology-based approaches to monitoring debris removal teams in the field (see Fig. 4 on the following page). The technologies used for tracking loads of debris as they moved through the system furnished the data for our studies, which were produced during a series of tornado storms in Alabama in 2011. (This was the first deployment of the tracking system.) Our first major study [C.a.16] explores tradeoffs in team performance as a function of changes in personnel (turnover) and team size (number of members) for debris removal teams. When the data are considered in aggregate (7583 team-days), the results suggest that increased turnover dimishes performance, and that increased team size increases effectiveness while reducing "equality" (here, the degree of uniformity in

distribution of work across the team). When arrayed over time, however, it is apparent that the relationship between team composition and performance is in flux throughout the mission. Both sets of results implicate the role of dispatchers in determining the composition of teams over time–and thus the overall performance of the mission.

Subsequent work in this domain established theoretical limits on system performance [C.a.20] and exploited both theoretical and empirical prior results to explore the effect of different incentive structures in shaping dispatcher—and therefore system—performance [C.a.22]. We developed and validated (against field data and other sources) a computational simulation to assess the efficacy of different incentive policies for (simulated) dispatchers exhibiting different degrees of rationality. The results suggest that a simpler incentive scheme yields less expensive, more efficacious outcomes than the current scheme. While these results are necessarily preliminary, the methodological approach suggests how naturally occurring data from the field—collected as part of routine operations—can be employed to draw inferences and make predictions about the factors that shape performance in team-based organizations.

Fig. 4: Debris Removal Team


Fig. 5: League of Legends (LoL) Team

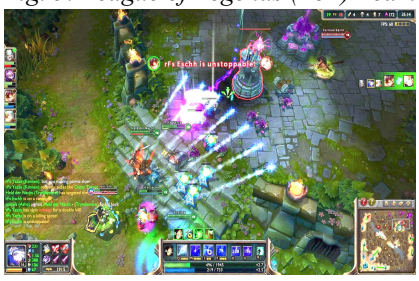
Fig. 6: LoL Environment

This work was the foundation of my student James Brooks' doctoral dissertation, for which he received the Del and Ruth Karger Best Ph.D. Dissertation Award from the ISE Department, and was also the basis for numerous conference publications [D.a.(28, 24, 23, 22)] in addition to the journal publications noted previously. A second doctoral student, Xin Zhang, is currently working with these data (and data from Super Storm Sandy) for his dissertation. This work was also the basis for an award-winning research presentation from an undergraduate student on the project, Olivia VonNieda. Notable presentations of this work include a keynote address in Brazil, a plenary talk for the MIT Collective Intelligence Conference, and a lecture to Portugal's National Laboratory of Civil Engineering. Finally, the totality of my work in this domain strongly informed my contributions as a member of a National Academies panel that produced a debris management guidance for state and local officials (see Sect. VII).

The fundamental theoretical concerns of this work—the relationship between team composition and performance—are also reflected in the second project, funded by Office of Naval Research, albeit in a very different domain. My colleagues and I are currently working with data on the working history of approximately 1,000 focal teams using data collected from approximately 10,000 matches played by them in the massively multiplayer online role-playing game *League of Legends* (see Figs. 5 and 6). Wayne Gray of RPI Cognitive Science and I have been leading a joint ISE/CogSci research group in this area for some time (two of the doctoral students on the project will be defending their dissertations in the coming months; another began his studies this prior academic year). This work has considerably expanded the theoretical models from the debris project to include considerations of improvisation and adaptation [C.a.23], largely due to the possibilities entrained by the availability of detailed, longitudinal data on moment-to-moment actions and interactions on thousands of matches [D.a.(34, 32, 31, 29)]. We fully expect that, as with the debris work, this research will yield prescriptive approaches to support the performance (and learning) of teams through the management of changes in team membership over time.

A related and emerging area of research is in the domain of "real" (as opposed to virtual) sports. With support from RPI, my colleagues and I first conducted an initial pilot study at the university's Experimental Media and Performing Arts Center (EMPAC) to explore prospects for automated player- and ball-tracking in the high-speed sport of volleyball (see Fig. 8). More recently, my collaborators and I are in the early stages of developing instrumented environments in the sport of ice hockey in order to track player movements (much as in *League of Legends*), supplemented with data from on-ice events (see Fig. 7). The synergies with the HPMS course are very strong with this project, and—though still in its early stages—it has provided numerous in-class research opportunities for the students. A proposal for external funding for this work is planned for sometime in the next 12 months.

Fig. 7: RPI hockey

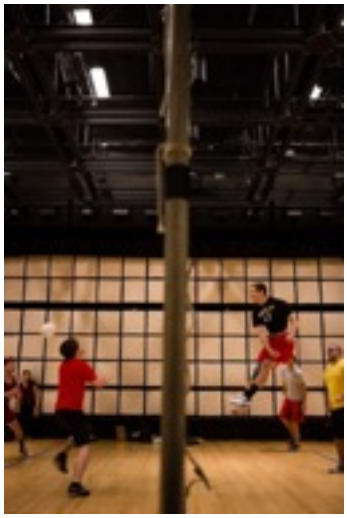

Fig. 8: EMPAC Volleyball

(3) *Cognitive and Decision Support Systems*.
My work on cognitive and decision support systems seeks to identify and address the challenge of using finite state machines to understand and support human creativity. In my early research in The Netherlands (which began during my doctoral studies in 1999 and continued until the late 2000s), I developed computer-based systems for exercising improvisational capability within a standing training program for the Emergency Services Department at the Port of Rotterdam, then as now Europe's largest port [C.a.(3, 5)] (see Fig. 9). Later, with support from an NSF CAREER grant, I extended this approach by building cognitively-grounded feedback—based in part on work in [C.a.9]—into the system, later undertaking experimental studies with emergency response personnel in New York and New Jersey [C.a.(14, 6), D.b.4, D.a.(19, 18, 16)]. In the midst of this project, my NSF-supported work on decision making in telecommunications restoration after 9/11 employed the lived experiences of restoration workers and managers to identify challenges and opportunities for decision support for improvisation [C.a.8, 10].

Fig. 9: Port of Rotterdam

Fig. 10: EMPAC Synthetic Environment

More recent work follows from the research on critical infrastructure restoration. My colleagues and I developed a human-in-the-loop simulation (again at EMPAC) to explore the relationship between information behavior and decision making for complex, time-constrained tasks (see Fig. 10). This project encompassed research on computer graphics, visualization, and team decision making [C.a.18], and leveraged prior work by my colleagues and the expertise of emergency management personnel. With RPI and other colleagues, I am actively engaged in developing these ideas further for a possible future proposal for external funding.

As suggested by my own research and that of others, an abiding challenge for decision making in the context of hazards and disasters derives from the need to provide prescriptive (decisional) guidance under dynamic conditions of sometimes profound uncertainty and risk. Addressing this challenge requires a renewed focus on identifying potentially high-impact research problems that lie beyond the boundary of existing disciplinary and interdisciplinary methods to address. This is particularly true for problems that involve large-scale, sometimes sustained interaction between human-machine systems and hazard-related phenomena situated within a broader policy and social context.

To this end, my EAGER proposal to NSF's Operations Engineering program addresses challenge of decision making in a hazards and disasters context under the rubric of Operations and Systems Engineering Extreme Event Research (OSEER). This work is designed to marshal both traditional and non-traditional sources of expertise in the broad area of Operations Engineering (OE) in order to accomplish three main objectives: first, to create and sustain a network of researchers, collaborators and other affiliates working within and across OE-centered areas; second, to stimulate this network through workshops and early-stage research activities in order to define high-impact, methodologically challenging problems in the field in the domain of hazards and disasters; and third, to develop publications and other outputs that establish preliminary research results and an agenda for future work to address emerging challenges that will contribute to society's ability to mitigate, respond to and learn from hazards and disasters. The proposal has been recommended for funding by the cognizant Program Officer, with final processing expected to conclude in time for a 1 September 2019 start date.

VI. Editorship of Journals, Review of Manuscripts, Books and Research Proposals

I currently serve as an Associate Editor for one journal publication of my main society, IEEE, and as a member of the editorial board for three other journals. I have served as a guest editor for two journals, and as a reviewer for a wide variety of journals and conferences in engineering and information systems. As a reviewer of research proposals, I have had extensive experience as an NSF panelist, as well as experience with other Federal agencies.

***Associate Editor*:**

- IEEE Transactions on Human-Machine Systems (2013–2016, 2019–present)

***Member of Editorial Board*:**

- IEEE Systems, Man and Cybernetics Society Magazine (2019–present)
- Journal of Contingencies and Crisis Management (2008–present)
- International Journal of Emergency Management (2001–present)
- Infrastructure Complexity (2013–2016)

***Guest Editor*:**

- Special Issue on "Research Methods in Emergency Management," International Journal of Emergency Management, vol. 5, nos. 1/2, (with B. Van de Walle), 2008
- Natural Hazards Review, Dec. 2007

***Reviewer (Journals)*:**

1. Cognition, Technology and Work (2010–)
2. Computational Mathematical and Organization Theory (2007–2010)
3. Creativity and Innovation Management (2014)
4. Decision Support Systems (2005–2009)
5. Disasters (2007–)
6. Earthquake Spectra (2011)
7. Electronic Markets (2014)
8. Environmental Monitoring and Assessment (2006)
9. Ergonomics (2012)
10. EURO Journal on Decision Processes (2014)
11. European Journal of Industrial Engineering (2007–)
12. IEEE Transactions on Human/Machine Systems (formerly IEEE Systems, Man and Cybernetics: Part A) (2004–)
13. IBM Journal of Research and Development (2012, 2019)
14. International Journal of Disaster Risk Reduction (2012–)
15. International Journal of Electronic Governance (2007)
16. International Journal of Emergency Management (2001–)
17. International Journal of Intelligent Control and Systems (2006)
18. International Journal of Mass Emergencies and Disasters (2010–)

19. Information Knowledge Systems Management (2003)
20. Journal of Contingencies and Crisis Management (2007–)
21. Journal of Homeland Security and Emergency Management (2007–2009)
22. Journal of Infrastructure Systems (2009)
23. Journal of Management Information Systems (2009)
24. Journal of Organizational Computing and Electronic Commerce (2016)
25. Journal of Urban Technology (2014)
26. Journal of Policy Analysis and Management (2013–2014)
27. Knowledge and Information Systems (2006)
28. Logistics Information Management: an International Journal (2003)
29. MIS Quarterly (2006)
30. Natural Hazards Review (2007–)
31. PLOS One (2018)
32. Policy Sciences (2007)
33. Public Administration (2015)
34. Reliability Engineering and System Safety (2014)
35. Safety Science (2005–)
36. Science (2018)
37. Structural Safety (2014)

Note: all dates approximate

Reviewer (Conferences):

1. Americas Conference on Information Systems (2001–2008)
2. Cognitive Science Society Annual Meeting (2001–)
3. Computer-Human Interaction (ACM) (2006–2008)
4. Hawaii International Conference on Systems Science (2001–2006)
5. Human Factors and Ergonomics Society Annual Conference (2005–)
6. IEEE International Conference on Systems, Man and Cybernetics (2001–)
7. Information Systems for Crisis Response and Management Conference (2004–)
8. International Conference on Information Systems (2001–2009)

Note: all dates approximate

VII. Service

Within RPI's School of Engineering, I served as co-chair of the Data Dexterity Task Force, part of a significant institute-wide effort to integrate data-centered topics into the undergraduate curriculum. Within the ISE Department, I led the successful introduction of a university-wide minor in Data Science and Engineering. Both of these efforts draw directly upon my research, my teaching, and my recent experience as an NSF Program Officer (Sect. XI). I have served as the ISE Department's Graduate Program Director and as Director of ISE's Doctoral Program. I have participated in various other departmental and university-level committees, particularly hiring, and have been active in advising student research.

Outside of RPI, I have been very active in my main society—IEEE Systems, Man and Cybernetics (SMC)—including as a member of the Board of Governors and as an Associate Editor for SMC Transactions on Human-Machine Systems. I have also served a variety of roles in the Information Systems for Crisis Response and Management Society, including as Program Co-chair for the society's annual international conference. I have participated in many international and domestic workshops, including 13 funded by the US Federal government. My community service includes significant and sustained mentoring of doctoral students and junior faculty in my research community, as well as participation in a National Academies panel that produced a debris management guidance for state and local governments.

The remainder of this summary provides further information on the underlined efforts; a complete list of service-related activities follows.

Service to RPI School of Engineering

I recently served as co-chair of the School of Engineering's **Data Dexterity Task Force (**co-chair, W. Randolph Franklin, Electrical, Computer and Systems Engineering Department). The task force is part of an effort to integrate Data Dexterity—that is, an ability to bring scientifically-grounded methods to bear in the ethical production, use and application of data and data models—into RPI's curriculum. Based particularly on my experiences at NSF, but also as an instructor and research in engineering and in computing, I firmly believe that this type of pedagogical innovation at the intersection of data and engineered (human-machine) systems is vitally needed. The task force's final report (completed in Spring 2019) consists of background research, analysis and synthesis, identification of department-specific and School of Engineering-wide needs and challenges, and, finally, recommendations for the incorporation of data dexterity into the School of Engineering curriculum—most importantly through the development of a data-intensive course which will reach every undergraduate student in the School of Engineering.

Service to ISE Department

I recently led the ISE Department's development of a university-wide **minor in Data Science and Engineering**. As stated in the official description, the minor "contributes to students' ability to organize, analyze and act upon data, particularly for data associated with engineered systems." My work on the minor consisted of scoping out and defining the program, meeting with faculty to solicit their feedback, advocating for the minor with the ISE faculty and within ISE's Undergraduate Curriculum Committee, and supporting the department's representative to the School of Engineering Curriculum Committee in presenting the minor. The minor has been approved and will go online in Fall 2019.

As **Graduate Program Director** for the ISE Department from 2011 to 2015, I was responsible for overall administration of the department's master's and doctoral programs. I also served as Director of the department's doctoral program, with duties that included outreach and recruitment, advising, and program planning and supervision, such as managing the Doctoral Qualifying Exam process. In collaboration with the faculty, I made teaching assistant (TA) assignments for ISE courses, as well as recommendations for TAs for General Engineering courses. This work involved considerable interaction with the ISE Department Chair and faculty, the Office of Graduate Education and the School of Engineering.

As part of my duties, I taught the required *Seminar in Industrial and Systems Engineering Research* (ISYE-6900) to first-year Ph.D. students (see Sect. III.A). I organized (and indeed continue to organize) the *ISE Departmental Seminar Series*, which brings in one to two speakers per month and includes meetings with ISE faculty and students. Occasionally, these seminars are co-sponsored with other RPI departments.

Other notable department-level service activities include advising the 2018 undergraduate class in Industrial and Management Engineering, serving as a member of ISE Undergraduate Curriculum Committee, and participating in departmental hiring committees.

Service to Professional Societies

I am a Senior Member of the **Institute for Electrical and Electronics Engineers** (IEEE) and currently sit on the Board of Governors of IEEE's Systems, Man and Cybernetics (SMC) Society. SMC is my main professional society, and I have been involved with it since my doctoral studies. My main responsibilities on the Board of Governors (in addition to supporting normal oversight and management functions) are as follows. First, I serve as the liaison to the Human-Machine Systems section of the society, with an emphasis on coordinating the activities of the Technical Committees which help define the section. Second, I am currently leading an effort to expand the scope and involvement of SMC in Brazil, a vital first step in addressing the larger challenge of increasing participation in SMC by individuals and institutions in South and Central America. Third, I am deeply involved in planning for the inaugural SMC conference on Human-Machine Systems in 2020, while also serving on the program committee for the main SMC conference in 2019.

Outside of my work on the Board, I am serving a second term (after taking leave to work at the National Science Foundation) as an Associate Editor for *IEEE Transactions on Human-Machine Systems* (THMS), the main journal for SMC's Human-Machine Systems Section. I also serve on the Editorial Board of *IEEE SMC Magazine*.

I fully intend to continue and deepen my involvement with SMC and with IEEE in general. This is likely to include seeking a nomination for another term on the board, continuing involvement with the SMC conference and the HMS society, conference and journal, and supporting membership initiatives.

Prior to moving to RPI and assuming additional responsibilities with IEEE, I was also involved in the first seven years of development of the **Information Systems for Crisis Response and Management Society**. I served numerous times as a member of the Program Committee for the society's main conference, organized multiple tracks and, in 2011, co-chaired the Program Committee (with J. Dugdale). I earned the society's Distinguished Service Award in 2010 and continue to maintain involvement through publications in the annual conference.

My **community service** includes workshops, significant mentoring activities and service to the National Academies.

I have participated in (and helped organize) research- and education-oriented **workshops** sponsored or co-sponsored by various U.S. and international agencies, including the National Research Council, NSF, Air Force Office of Scientific Research, DARPA, Department of Homeland Security and NATO. Most of these workshops have centered on the hazards and disasters domain, and in particular the role of information technologies and data in improving societal resilience to disasters.

I have taken part in various **multi-day mentoring programs** for doctoral students in the US and abroad and have served on the doctoral committees of students at both US and foreign institutions. Through regular

conference duties (particularly through ISCRAM), I have run both formal and informal sessions on research methods with strong involvement from doctoral students.

I participated as a **faculty mentor** in two iterations of the NSF-sponsored program entitled "Enabling the Next Generation of Hazards Researchers." These were competitive programs that sought to attract a diverse and promising group of Assistant Professor "fellows" to research in the hazards and disasters domain. My duties included working with fellows to develop their research portfolios and to build their research communities. During my time at NSF (when the program sat in my portfolio for its final year), I also ran a mock panel where fellows could watch as the panel debated the fellows' submitted proposals. Finally, for this year's IEEE-SMC meeting, Dave Kaber of Univ. of Florida and I have proposed a one-day junior faculty seminar that will focus on publishing and on funding.

As a final aspect of service, my work in the area of debris removal led to my participation on a National Research Council panel which guided the work that produced *A Debris Management Handbook for State and Local DOTs and Departments of Public Works* (NCHRP 781), the first such guidance of its kind.

A. Service to University

a. University Committees, including School/College Committees

1. Data Dexterity Task Force, School of Engineering, RPI (co-chair, Randolph Franklin), Spring 2019.
2. Artificial Intelligence/Machine Learning Hiring Initiative, RPI, Fall 2018–.
3. School of Engineering Faculty Excellence Awards Committee, RPI, Spring 2015.
4. College of Computing Sciences Dean Search Committee, NJIT, Spring 2005.
5. International Relations Committee, NJIT, Fall 2003–Spring 2008.
6. Teaching, Learning and Technology Committee, NJIT, Spring 2003–Spring 2004.
7. Albert Dorman Honors College Colloquium Committee, NJIT, Fall 2002–Fall 2003.

b. Department Committees and Assignments

1. Coordinator, ISE Department Seminar Series, Fall 2011–Spring 2015 and Fall 2017–.
2. Chair, ISE Department Head Hiring Committee, Spring 2019–.
3. Member, Undergraduate Program Committee, Department of Industrial and Systems Engineering, RPI, Fall 2017–.
4. Promotion and Tenure Committee, Department of Industrial and Systems Engineering, RPI, Fall 2010–Spring 2015 and Fall 2017–.
5. Member, Faculty Hiring Committee, Department of Industrial and Systems Engineering, RPI, Fall 2013–Spring 2015 and Fall 2017–.
6. Graduate Program Director, Department of Industrial and Systems Engineering, RPI, Fall 2011–Spring 2015.
7. Information Systems Ph.D. Committee, NJIT, Fall 2005-Spring 2010.
8. Information Systems Faculty Hiring Committee, NJIT, Fall 2003-Spring 2005.
9. Excellence in Teaching Committee, Information Systems, NJIT, Fall 2003-Spring 2004.
10. Mentor, Ronald E. McNair Post-baccalaureate Achievement Program, NJIT, 2001–2009.

c. Other Service and Administration Activities

1. Mentoring of ISE Assistant Professor Sérgio Pequito, 2018–.
2. Mentoring of former ISE Assistant Professor Wei Xi, 2015–2016.

d. Undergraduate Academic and Course Registration Advising

1. Class Advisor, IME Undergraduate Class of 2018, Department of Industrial and Systems Engineering, RPI, Fall 2017–Spring 2018.

B. Service to Professional Societies

a. Institute of Electrical and Electronics Engineers (IEEE)

1. Senior Member, IEEE (2012–), Member (2001–2011)
2. Member-at-Large, Board of Governors. IEEE Systems, Man and Cybernetics Society (term: 2018–2020). Duties include (i) participation in shared oversight of all aspects of the society, (ii) special projects on increasing membership and improving connections with related societies, and (iii) service as liaison to the Human-Machine Systems branch of the society.
3. Member (2013–2014), Co-chair (2015–2017), IEEE Systems, Man and Cybernetics Technical Committee on Homeland Security. Duties included recruitment and retention of new members, organizing special sessions at conferences and workshops, and coordinating new initiatives.
4. Member, IEEE Systems, Man and Cybernetics Meetings and Events Committee (2015–2017). Duties included review of proposal to the IEEE Systems, Man and Cybernetics Society for sponsorship of conferences, workshops, and related events.
5. Program Co-chair, IEEE International Conference on Human-Machine Systems, Rome, Italy, 6–8 April 2020.
6. Program Committee Member, IEEE International Conference on Systems, Man and Cybernetics. Bari, Italy, 6-9 October, 2019.
7. Program Committee Member, IEEE International Conference on Systems, Man and Cybernetics. Hong Kong, 9-12 October, 2015.
8. Track Chair, “Homeland Security.” IEEE International Conference on Systems, Man and Cybernetics, San Antonio, TX, 11-14 October, 2009.
9. Track Co-Chair (with W.A. Wallace), "Interdependent Critical Infrastructure Systems.” IEEE International Conference on Systems, Man and Cybernetics, The Hague, The Netherlands, 10-13 October 2004.

b. Information Systems for Crisis Response and Management (ISCRAM)

1. Co-chair (with J. Dugdale) Program Committee, Information Systems for Crisis Response and Management Conference, Lisbon, Portugal, 8–11 May 2011.
2. Program Committee Member, Information Systems for Crisis Response and Management Conference, Gothenburg, Sweden, 10-13 May 2009.
3. Track Chair, “Research Methods in Crisis Decision Making and Decision Support Systems.” Information Systems for Crisis Response and Management Conference, May 2009.
4. Program Committee Member, Information Systems for Crisis Response and Management Conference, Washington, DC, 4-7 May 2008.

5. Track Chair, “Research Methods in Crisis Decision Making and Decision Support Systems.” Information Systems for Crisis Response and Management Conference, 4-7 May 2008
6. Track Chair, “Research Methods in Crisis Decision Making and Decision Support Systems.” Information Systems for Crisis Response and Management Conference, 13-16 May 2007
7. Instructor, Information Systems for Crisis Response and Management/The International Emergency Management Society, Summer School, Tilburg University, The Netherlands, 15 June 2006.
8. Program Committee Member, Information Systems for Crisis Response and Management Conference, Newark, NJ, 14-17 May 2006.
9. Track Chair, “Research Methods in Crisis Decision Making and Decision Support Systems.” Information Systems for Crisis Response and Management Conference, 14-17 May 2006.
10. Track Chair, “Research Methods in Crisis Decision Making and Decision Support Systems.” Information Systems for Crisis Response and Management Conference, Brussels, Belgium, 4-7 May, 2005.
11. Program Committee Member, Information Systems for Crisis Response and Management Conference, Brussels, Belgium, 19-21 April 2004.

c. Participation in Federally-sponsored Workshops

1. Participant (Virtual), “Emergency Management Region II Higher Education Academic/Practitioner Collaboration,” Federal Emergency Management Agency, St John's University, 7 August 2019.
2. Participant, “A Research Agenda for the Emergency Management Higher Education Community,” Department of Homeland Security, Emergency Management Institute, Emmitsburg, MD, 8–9 August 2017.
3. Program Director Participant, NSF CAREER Proposal Writing Workshop, Portland, OR, 2-4 April 2017.
4. Program Director Participant, NSF CAREER Proposal Writing Workshop, St. Louis, MO, 21-22 March 2016.
5. Participant, “Federal Emergency Management Agency/US Army Corps of Engineers Senior Leaders Seminar,” Arlington, VA, 12 April 2011.
6. Participant, “Technology, Tools, and Continuity of Operations for Extreme-scale Disasters,” DARPA, Massachusetts Institute of Technology Lincoln Laboratories, Dedham, MA, 29-30 June 2010.
7. Participant, “National Earthquake Resilience: Research, Implementation, and Outreach,” National Research Council, Irvine, CA, 17–18 August 2009.
8. Participant, “Security: Advancing a Framework for Enquiries,” Joint NATO/National Science Foundation/European Science Foundation workshop, Paris, France, 17–18 November 2008.
9. Participant, “Decision Modeling and Behavior in Uncertain and Complex Environments,” Air Force Office of Scientific Research, University of Arizona, Tucson, 28 February–1 March 2008.
10. Co-organizer (with W. Bouwman), “Workshop on Defining an Agenda for Research on Information and Communication Technology in Crisis Management,” National Science Foundation and Technical University at Delft, Delft, The Netherlands, 5–6 November 2007.
11. Co-organizer (with M. Haselkorn and R. Larson), "Humanitarian Service Science and Engineering Workshop," National Science Foundation, Seattle, Washington, 8 October 2007.

12. Participant, “Research & Education for Humanitarian Action Systems Planning Meeting,” National Science Foundation, Washington, DC, 26 January 2007.
13. Participant, “Resilient and Sustainable Infrastructures,” National Science Foundation, Arlington, VA, 4–5 December 2006.
14. Participant, “Workshop on the Use of Information Technology to Enhance Crisis Management for Natural and Manmade Disasters,” National Research Council, Washington, DC, 22–23 June 2005.

d. Participation in Other Workshops

1. Participant, “INFORMS Academic Leadership Workshop,” INFORMS Annual Meeting, Houston, TX, 21 October 2017.
2. Participant, “Resilience-based Approaches to Critical Infrastructure Safeguarding,” Ponta Delgada, Portugal, NATO, 27 June 2016.
3. Participant, “Unified Data Collection,” American Lifelines Alliance Workshop, Washington, DC, 11–12 October 2006.
4. Participant, “Multidisciplinary Center for Earthquake Engineering Research (MCEER) Workshop on Lessons from the World Trade Center Terrorist Attack,” New York, NY, 24–25 June 2002.
5. Participant, First Annual Conference on Infrastructure Priorities: A National Infrastructure Research Agenda, Academy for Educational Development, Washington, DC, 24–26 October 2001.

e. Organization of Other Workshops and Conferences

1. Co-organizer (with Fred Roberts), “2014 DIMACS/CCICADA Science and Technology Innovations and Applications in Hurricane Sandy Research,” Rutgers University, Piscataway, NJ, 21-22 October 2014.
2. Member, Program Committee, “Complex Events and Information Modeling,” Federated Conference on Computer Science and Information Systems, Warsaw, Poland, 7-10 September 2014.
3. Co-organizer (with F. Roberts, Rutgers Univ.), “2013 DIMACS/CCICADA Workshop on Science and Technology Innovations in Hurricane Sandy Research,” Rutgers University, Piscataway, NJ, 5 June 2013.
4. Member of Advisory Board, “Special Interest Group: Decision Support Systems Workshop,” International Conference on Information Systems, Milwaukee, WI, 10–13 December 2006.
5. International Advisory Committee Member, First International Conference on Knowledge, Information and Creativity Support Systems, Ayutthaya, Thailand, 1–4 August 2006.

f. Professional Society Memberships

1. Senior Member, IEEE (2012–), Member (2001–2011)
2. Member, Tau Beta Pi Engineering Honor Society (2004 –).
3. Member, Human Factors and Ergonomics Society (2010–)
4. Member, Cognitive Science Society (2001–)
5. Member, Institute for Operations Research and Management Science (INFORMS) (1997–).

C. Community Service

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

2. Panelist, National Academies of Science, National Cooperative Highway Research Program (NCHRP) Project 20-59(37), “Debris Management Handbook for State and Local DOTs (NCHRP Report 781)” 2011–2013.
3. Faculty Mentor, "Enabling the Next Generation of Hazard Researchers.” National Science Foundation grant 0758484 (PI: Thomas Birkland), 2008–2013.
4. Panel Chair, Improvised Thought, Behavior and Structure in Emergency Response. Natural Hazards Workshop, Boulder, CO, 8-11 July, 2005.

VIII. Professional and Public Lectures

I have given invited lectures in international fora (14 lectures in nine countries, including two keynotes) and domestic fora (44 lectures, including three prominent talks) as a faculty member and as an NSF Program Officer. Also during my time at NSF, I had substantial interaction with researchers, administrators and funders nationally and internationally through invited on-campus visits. My lectures to academic departments have taken place predominantly in departments of engineering, as well as in social science and cross-cutting departments and institutes.

A. Invited Lectures: International Fora

1. "Prospects and Challenges for Improving Post-disaster Debris Removal Performance: Observations from 9/11 to the Present." Joint Workshop: IEEE Systems, Man and Cybernetics Society and Brazilian Society for Operations Research, Limeira, Brazil, 3 September 2019.
2. "Empirical, Methodological and Organizational Frontiers in Interdisciplinary Hazards Research." Disaster Prevention Research Institute, Kyoto University, Kyoto, Japan, 11 October 2018.
3. "Hazards- and Disasters-related Funding at NSF." United Kingdom Research Councils, Swindon, UK, 7 March 2017.
4. "Hazards- and Disasters-related Funding at NSF." School of Technology, Policy and Management, Technical University at Delft, Delft, The Netherlands, 10 March 2017.
5. "Hazards- and Disasters-related Funding at NSF." National Science Foundation European Office, Brussels, Belgium, 13 March 2017
6. Keynote Speaker, "Collective Behavior in Queueing Networks: The Case of Post-disaster Debris Removal Operations." 17th Annual Brazilian Ergonomics Conference (ABERGO), Universidade Federal de São Carlos, São Carlos, Brazil, 16 September 2014.
7. "Collective Behavior in Queueing Networks: The Case of Post-disaster Debris Removal Operations." Department of Informatics, Federal University of Rio de Janeiro, Brazil, 15 September 2015.
8. "An Historical Perspective on Community Resilience: The Case of the 1755 Lisbon Earthquake." Resilience Engineering Symposium, Lisbon, Portugal, 23 June 2015.
9. "Collaborative Improvisation: Insights from Emergency Response and Jazz Performance." The Industrial and Systems Engineering Research Conference, Montreal, Canada, 31 May-3 June 2014.
10. "An Exploration of Temporal Trends in Team Composition Performance Effects." The Industrial and Systems Engineering Research Conference, Montreal, Canada, 31 May-3 June 2014.
11. "Team Fluidity and Performance in Large-scale Debris Removal Operations." National Civil Engineering Laboratory, Lisbon, Portugal, 13 May 2012.
12. 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.
13. Instructor. "Agent-based Simulation." Risk Management in Civil Engineering: Advanced Course, National Civil Engineering Laboratory, Lisbon, Portugal, 19 November 2008.
14. "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.
15. "Impact of the 2001 World Trade Center Attack on Critical Infrastructure Interdependencies." Construction Management Department, University of Karlsruhe, Karlsruhe, Germany, 19 August 2002.

B. Invited Lectures: Domestic Fora

1. "Prospects and Challenges for Improving Post-disaster Debris Removal Performance: Observations from 9/11 to the Present." FEMA Region II Emergency Management Higher Education Collaborative Effort, Online, 6 August 2019.
2. "Big and Wide Data Meet Team Performance in Dynamic Task Environments." MITRE College Lecture Series, Bedford, MA, 14 March 2019.
3. "An Historical Perspective on Community Resilience: The Case of the 1755 Lisbon Earthquake." Joint seminar for the Department of Civil and Engineering, University of Massachusetts at Lowell and the Saab Center for Portuguese Studies, 25 February 2019.
4. "Big Data Meets Team Performance in Dynamic Task Environments." School of Systems and Enterprises, Stevens Institute of Technology, 21 February 2018.
5. "Empirical and Methodological Frontiers in Human-centric Research on Hazards and Disasters." Eminent Interdisciplinary Scholar Series, Virginia Tech, Blacksburg, VA, 26 February 2018.
6. "Big Data Meets Team Performance in Dynamic Task Environments." Integrated Systems Engineering Department, The Ohio State University, 13 December 2017.
7. Panelist, City and Urban Planning session, Data-Intensive Studies Center (DISC) Symposium, Tufts University, Boston, MA, 8 November 2017.
8. "Teamwork in e-Sports: Evidence from League of Legends." INFORMS Annual Meeting, Houston, TX, 24 October 2017.
9. "Big Data Meets Team Performance in Dynamic Task Environments." Civil Engineering Department, Drexel University, 2 March 2017.
10. "Cognitive Foundations of Improvisation in Emergency Response." Department of Sociology, University of California at Irvine, 2 Nov 2009.
11. "Cognitive Foundations of Improvisation in Emergency Response." Department of Sociology, Oklahoma State University, 22 Jan 2007.

11–24: NSF Outreach Lectures: "Overview of NSF Programs in Hazards and Disasters." (Various dates and locations, 2015–2017).

Delivered to Academic Units

12. School of Mechanical, Industrial, and Manufacturing Engineering, University of Oregon, 3 April 2017.
13. Department of Mechanical and Industrial Engineering and Department of Civil Engineering, Northeastern University, 14 Feb 2017.
14. Department of Civil Engineering, Drexel University, 8 Dec 2016.
15. School of Industrial and Systems Engineering, Georgia Institute of Technology, 6 December 2016.
16. School of International and Public Affairs, North Carolina State University, 18 Oct 2016.
17. Department of City and Regional Planning, University of North Carolina at Chapel Hill, 17 October 2016.
18. College of Emergency Preparedness, Homeland Security, and Cyber-Security; University at Albany, 18 March 2016.

19. Department of Landscape Architecture and Urban Planning, Texas A&M University, 15 March 2016.
20. Laboratory for Information and Decision Systems, Massachusetts Institute of Technology, Spring 2017.

Delivered at Conferences/Workshops

21. Institute for Operations Research and Management Science (INFORMS), 23 October 2017.
22. NSF Europe, Brussels, Belgium, 11 March 2017.
23. NIST Community Resilience Workshop, Washington, DC, Spring 2016.
24. TAMS4CPS Workshop, Stevens Institute of Technology, Hoboken, NJ, 16-17 May 2016.
25. Natural Hazards Workshop, Boulder, CO, 20 July 2015.

25–30: "Effective Proposal Writing from the Inside Out." (Various dates and locations, 2017–2018)

26. Social Science and Environment Network, University of Massachusetts at Amherst, 9 November 2018
27. Industrial and Systems Engineering Department, University at Buffalo, 27 April 2018.
28. Civil and Environmental Engineering Department, RPI, 7 February 2018.
29. Industrial and Systems Engineering Department, RPI, 29 November 2017.
30. Cognitive Science Department, RPI, 15 November 2017.
31. School of Mechanical, Industrial, and Manufacturing Engineering, University of Oregon, 3 October 2017.
32. "Cognitive Strategies in Collaborative Improvisation: From Jazz to 9/11." Seminar on Interdisciplinary Research and Education in Nuclear Emergency Response (SIREN), Virginia Polytechnic Institute, Arlington, VA, 7 April 2016.
33. "Network Improvisation in Emergency Response: An Application to Debris Removal Operations." Science and Technology Innovations and Applications in Hurricane Sandy Research, Rutgers University, Piscataway, NJ, 21-22 October 2014.
34. Plenary. "Collective Behavior in Queueing Networks: The Case of Post-disaster Debris Removal Operations." MIT Collective Intelligence Conference, MIT, Cambridge, MA, 12 June 2014.
35. "Team Fluidity and Performance in Large-scale Debris Removal Operations." Department of Civil and Environmental Engineering, Rensselaer Polytechnic Institute, 22 February 2012.
36. "Synthetic Environments for the Study of Group Decision Making." U.S. Military Academy at West Point, Center for Enhanced Human Performance, 2 February 2012.
37. "Collaborative Information Foraging in Emergency Response Organizations: An Application Involving Synthetic Environments." Indiana University/Purdue University at Indianapolis, 18 November 2011.
38. "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.

39. Panelist, “Finite State Machines Versus Infinite Human Creativity: Wedging Computer-Based Simulations into Studies of Group Improvisation.” Human Factors and Ergonomics Society Annual Conference, 28 September 2010.
40. Panelist, “Emergent Interoperability: Collaborative Adhocracies and Mix and Match Technologies in Emergency Management.” Computer-supported Cooperative Work Conference, Banff, Alberta, Canada, 7 November 2006.
41. “Adaptative 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.
42. “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.
43. "Impact of the 2001 World Trade Center Attack on Critical Infrastructure Interdependencies.” Consolidated Edison Inc., New York, NY, 22 November 2002.
44. "Impact of the 2001 World Trade Center Attack on Critical Infrastructure Interdependencies." Public Service Enterprise Group Security Council, Newark, NJ, 19 November 2002.
45. “A Methodology for Investigating Organizationally-situated Improvisation in Emergency Response.” Disaster Research Center, University of Delaware, Newark, DE, 1 February 2002.

IX. Honors and Awards

A. Awards to Mendonça

- Faculty Award for Excellence, Department of Industrial and Systems Engineering, RPI, 2018.
- CAREER Award, National Science Foundation, 2005–2010.
- Distinguished Service Award, Information Systems for Crisis Response and Management Society, 2010.

B. Awards to Mendonça’s Students

- Del and Ruth Karger Best Ph.D. Dissertation Award, James Brooks, Department of Industrial and Systems Engineering, RPI, 2015.
- Best Poster Presentation, Undergraduate Research Symposium Presentation, Olivia VonNieda, Department of Industrial and Systems Engineering, RPI, 2014.
- Founder's Award of Excellence, James Brooks, RPI, 2011.

X. Sabbatical Leaves, Off-Campus Study Programs, Foreign Professional Travel

My international collaborations (some longstanding) have been integral to my research, education and service activities. In addition to lectures in the U.S. and abroad (Sect. VIII) and my work on domestic and international conferences and workshops (Sect. VII), I have had significant collaborations with researchers and practitioners in Portugal (including one year-long sabbatical and numerous short-stay visits) and The Netherlands (including two extended stays and numerous short-stay visits). I fully anticipate drawing upon this network for my pending project on Operations and Systems Engineering Extreme Event Research (see Sect. V).

- One sabbatical (2008–2009 academic year) as a Visiting Researcher at the University of Lisbon in Portugal working on the topic of improvisation in emergency response.

- Numerous short stays at University of Lisbon in Portugal (2012–2015) working on study of the 1755 Lisbon earthquake.
- One eight-month stay in 2007 as a Visiting Professor in the School of Technology, Policy and Management (TPM) at Delft University of Technology in The Netherlands, working on the topic of group decision making, along with numerous shorter visits. (As a doctoral student, I was a Visiting Scholar in TPM for 10 months in 1999.)
- Travel for invited international lectures (Sect. VIII) and for conferences and workshops (Sect. VII).

XI. Other Activities

I have been active nationally and internationally in supporting growth and innovation in Industrial and Systems Engineering and in related fields. This section discusses my work as a consultant to the National Institutes of Science and Technology and, most recently, as a Program Officer at the National Science Foundation, where I directed one program (HDBE), helped start another (M3X), served as program officer for three more (CRISP, S&CC, PFI:BIC), and was extensively involved in extramural activities such as serving on Federal committees.

A. National Institutes of Standards and Technology

As a **consultant** to Applied Risk Analysis, Inc. under contract from the National Institute of Standards and Technologies (NIST), I participated in a year-long study (concluding in 2015) to assess the state-of-the-art in approaches to modeling interdependent infrastructure systems. The project included frequent interactions with NIST personnel and other project members. Our final report to NIST addressed conceptual and technical issues and gaps in infrastructure modeling, and included an extensive review and analysis of prior theoretical and applied research. I was a co-author on the final report to NIST, the findings of which were used to inform their efforts in community resilience undertaken through the NIST Center of Excellence at Colorado State University. My experience on this project—as well as my extensive prior research in the area—proved immensely useful in my later work with infrastructure-related programs at the National Science Foundation, discussed next.

B. National Science Foundation

I recently completed a two-year full-time assignment (from 8 September 2015 until 7 September 2017) as a Program Officer in the Division of Civil, Mechanical and Manufacturing Innovation (CMMI), located within the Directorate for Engineering of the National Science Foundation (NSF).

As discussed in the remainder of this section, I completely revised and managed one standing program (*Humans, Disasters and the Built Environment*), helped start another (*Mind, Machine and Motor Nexus*), and participated in managing multiple others (including *CRISP*, *S&CC* and PFI:BIC, as discussed below). My work included program administration (such as running panels and making awards), but also outreach, new initiatives, and collaborations and interactions with a domestic and international network of funding personnel, agencies and researchers.

Programmatic Duties

My main appointment was as Program Director for the Humans, Disasters and the Built Environment Program, or **HDBE**, which was previously called the Infrastructure Management and Extreme Events (IMEE) program. Prior to my arrival, the IMEE program portfolio was mainly split between work in social science research and work in engineering, along with some cross-cutting work combining social science and engineering. With the support of my division's leadership, I completely revised and strengthened the program (including renaming it to HDBE) in order to put humans, the built environment and disasters on equal footing. Indeed, the program *only* accepts proposals that address all three of these aspects, as reflected in the program description:

> The Humans, Disasters and the Built Environment (HDBE) program supports fundamental, multidisciplinary research on the interactions between humans and the built environment within and among communities exposed to natural, technological and other types of hazards and disasters. ... The HDBE program seeks research that integrates these elements and that can contribute to theories that hold over a broad range of scales and conditions.

The reframing of the program is vital for encouraging work on longer-term phenomena, such as population resettlement or displacement due to climate change (e.g., in coastal communities). And as noted in the program description, HDBE-funded research is expected to improve the robustness of theory on human interaction with the built environment in conditions that may range from stable to extreme.

To support further growth of the program, I worked actively to attract proposals in emerging areas, including purely methodological research (particularly for multi- and interdisciplinary methods), data-intensive and computationally-intensive approaches, and large-scale, longitudinal studies. This was accomplished through extensive outreach to and cultivation of PIs, as well as collaborations with other Federal agencies, as discussed below. The net result is a program that is firmly established in the Directorate for Engineering, but which is now squarely focused on cutting-edge approaches to cross-disciplinary research in the hazards and disasters domain.

I served key roles in two other programs–Critical Resilient Interdependent Infrastructure Systems and Processes (CRISP) and Smart and Connected Communities (S&CC)–helped start a third, Mind, Machine and Motor Nexus (M3X), and participated in others (such as PFI:BIC).

The **CRISP** program is the latest in a long string of infrastructure-related programs sponsored by NSF since the September 11 attacks. Prior to NSF, I participated in NSF-funded infrastructure-related projects, took part in many NSF-funded workshops in the area, and had contacts and collaborations with national and international colleagues working in this area. At NSF, I was a member of the core CRISP team, tasked with helping to revise the language for the latest solicitation, interacting with investigators, running panels, making recommendations for funding (from a budget of approximately $22.9M), and managing a portfolio of previously funded projects. This work involved close collaborations with individuals in the Directorates that funded CRISP: Engineering (ENG); Social, Behavioral and Economic Sciences (SBE); and, until recently, Computer and Information Science and Engineering (CISE).

For **S&CC**, I served as the lead representative from the Directorate for Engineering on this multi-directorate (CISE, ENG, SBE and Education and Human Resources) initiative. I joined S&CC (and NSF) at the time funding decisions were being made on the S&CC Dear Colleague Letter that explored whether a program in this area could be viable. Subsequently, I was deeply involved in developing the first full S&CC solicitation (with an inaugural budget of approximately $18.5M): I was one of roughly five people on the core writing team for the solicitation, helped shepherd paperwork through the foundation, handled investigator inquiries, participated in webinars, ran panels, did reverse site visits, and helped make awards.

M3X, which is a new standing program within CMMI, illustrates the integration of data and Artificial Intelligence for human-machine systems:

> A distinguishing characteristic of the program is an integrated treatment of human intent, perception, and behavior in interaction with embodied and intelligent engineered systems and as mediated by motor manipulation. M3X projects should advance the holistic analysis of cognition and of embodiment as present in both human and machine elements. This work will encompass not only how mind interacts with motor function

in the manipulation of machines, but also how, in turn, machine response and function may shape and influence both mind and motor function.

I worked closely with my colleague Jordan Berg to develop the idea for this program (including the program description) and—with the support of CMMI's Division Director, Deborah Goodings—to secure its approval. I also served on the search committee for its first director.

In addition to these programs, I supported various other programs—including "Partnership for Innovation: Building Innovation Capacity" (PFI:BIC) as a Program Officer and "Data Infrastructure Building Blocks"—by helping to administer panels, handle investigator inquiries, and process proposals. I also participated in numerous *ad hoc* and standing committees and collaborated extensively with colleagues in the Directorate for Computer and Information Science and Engineering and in the Directorate of Social, Behavioral and Economic Sciences, as well as with many other individuals in the Engineering Directorate. Finally, in order to support the transfer of my responsibilities to other NSF personnel following the end of my full-time appointment on 7 September 2017, I fulfilled NSF's request to serve as an Intermittent (part-time) Program Officer until 23 December 2017.

Extramural Duties
The HDBE program has a long history of interaction with national and international agencies. As Program Director, I served on the White House Office of Science and Technology Policy's **Critical Infrastructure Security and Resilience Committee**, as well as on the U.S. Science and Technology Council's **Subcommittee on Disaster Reduction**, which serves as the U.S. National Platform for the United Nations International Strategy on Disaster Reduction. My work with the former committee led directly to a joint DHS/NSF Dear Colleague Letter (DCL) on Simulated and Synthetic Data for Infrastructure Management. I worked with my DHS collaborator to secure a total of $2M in funding for the program, as well as to evaluate and fund the projects. This DCL attracted a crop of new investigators to CMMI and resulted in many pathbreaking new projects.

My work on an NSF-wide initiative on public access data included supporting a CMMI-funded workshop on the topic (PIs: S. French, P. Voorhees), as well as substantial interactions (through site visits in Europe) with the UK Research Councils and the European Research Council. These efforts helped lay the groundwork for ongoing efforts concerning public access to data within the Directorate for Engineering.

Finally, outreach to universities and conferences was an important part of my duties (see Sect. VIII). My university visits typically included meeting personally with faculty, students and administrators, as well as touring facilities. Outreach was essential not only for promoting NSF funding opportunities, but also for receiving and providing various forms of feedback from researchers and administrators, whether on proposals, solicitations or emerging research areas.