MATTHEW L. BOLTON

Associate Professor of System Engineering ♦ Department of Engineering Systems and Environment
151 Engineer's Way ♦ University of Virginia ♦ Charlottesville, VA 22903 ♦ (434) 243-7699 ♦ mlb4b@virginia.edu

I. Research Interests

System safety, human performance modeling, erroneous human behavior, systems engineering, formal methods, model checking, human-automation interaction, system failure, situational and spatial awareness, psychophysics, auditory perception, cyber security, technology and democracy, philosophy of engineering, engineering ethics

II. Education

- Ph.D., Systems Engineering, University of Virginia, Charlottesville, with distinction. August 2010. Dissertation: Using Task Analytic Behavior Modeling, Erroneous Human Behavior Generation, and Formal Methods to Evaluate the Role of Human-automation Interaction in System Failure. Advisor: Dr. Ellen Bass.

- M.S., Systems Engineering, University of Virginia, Charlottesville, with distinction. January 2006. Thesis: An investigation of the effects of texture and field of view on spatial awareness in synthetic vision head-down displays. Advisor: Dr. Ellen Bass.

- B.S., Computer Science, Minor in Applied Mathematics, University of Virginia, Charlottesville. May 2003.

III. Employment History

Current Appointments

- Associate Professor, Systems Engineering, Department of Engineering Systems and Environment, University of Virginia, 01/2022 – Present.

- Adjunct Associate Professor, Department of Industrial and Systems Engineering, University at Buffalo, State University of New York, 01/2022 – Present.

Past Professional Experience

- Associate Professor, Department of Industrial and Systems Engineering, University at Buffalo, State University of New York, 01/2019 – Present.

- Assistant Professor, Department of Industrial and Systems Engineering, University at Buffalo, State University of New York, 01/2014 – 01/2019.

- Adjunct Assistant Professor, Department of Mechanical and Industrial Engineering, University of Illinois at Chicago, 01/2014 – 05/2016.

- Assistant Professor, Department of Mechanical and Industrial Engineering, University of Illinois at Chicago, 08/2012 – 01/2014.

- Courtesy Appointment, Assistant Professor, Department of Computer Science, University of Illinois at Chicago, 10/2012 – 01/2014.

- Senior Research Associate, San José State University Research Foundation, NASA Ames Research Center, Moffett Field, CA, 08/2010 – 08/2012.

- Adjunct Assistant Professor, San José State University, Department of Industrial and Systems Engineering, San José, CA, 01/2012 – 08/2012.

- Independent Consultant for the University of Virginia, 02/2011 – 10/2011.

- Graduate Research Assistant, Department of Systems and Information Engineering, University of Virginia, Charlottesville, 08/2003 – 08/2010.

- Visiting Scholar, NASA Ames Research Center, Moffett Field, 09/2009.

– Visiting Scholar, National Institute of Aerospace, Hampton, 05/2009.

– Rising Star Fellow / Intern, NASA Langley Research Center, Hampton, 07/2004 – 08/2005.

– Research Assistant, Center for Applied Biomechanics, University of Virginia, Charlottesville, 05/2000 – 08/2003.

IV. Honors and Awards

Awards

– Jerome H. Ely Human Factors Article Award, for the best paper published in the Human Factors journal in 2020.

– My entry (Humanistic Engineering: A Transformative Agenda for a Better Future) received an honorable mention in the 2020 National Academies' Idea Competition for the Symposium on Imagining the Future of Undergraduate STEM Education: https://tinyurl.com/y3zvu4ke

– University at Buffalo's School of Engineering and Applied Science Early Career Researcher of the Year Award, 2018.

– William C. Howell Young Investigator Award, Human Factors and Ergonomics Society, 2018.

– Army Young Investigator Award Recipient, 2015-2017.

– Selected as a Senior Member of the IEEE Society, 2015.

– Franklin V. Taylor Memorial Award for the Best Conference Paper (out of 612 accepted papers) at the 2011 IEEE International Conference on Systems Man and Cybernetics.

– Best paper award (out of 24 accepted papers) at the 20th Annual Conference on Behavior Representation in Modeling and Simulation (2011).

– Louis T. Rader Outstanding Graduate Student Award, University of Virginia, Department of Systems and Information Engineering, 2010/2011.

– University of Virginia Award for Excellence in Scholarship in the Sciences & Engineering, 2008.

– Student Member with Honors in the Human Factors and Ergonomics Society, 2007-2010.

– Louis T. Rader Outstanding Masters Student Award, University of Virginia, Department of Systems and information Engineering, 2005/2006.

– Best paper in the Human Computer Interaction track at the 2006 IEEE Systems and Information Engineering Design Symposium.

Fellowships

– Engineering in Medicine faculty fellowship, 2022-2023.

– National Library of Medicine medical informatics trainee fellowship, 2007–2010.

– Governor's Fellowship, spring 2007.

– ARCS Scholarship, 2006–2007.

– National Institute of Aerospace's Rising Star Fellowship, 2004–2006.

Advisee and Mentored Student Awards

– Olivia Clare Rose (advisee) received a Provost's Fellowship from the University of Virginia.

– Skye Solace Taylor (advisee) received a Presidential Fellowship from the University of Virginia.

– Giovanna Camacho (advisee) received the competitive Laurel Clark Sea to Space Physiology Research Grant from the Women Divers Hall of Fame.

– Giovanna Camacho (advisee) was awarded multiple fellowships by the University of Virginia: Engineering Academic Commitment to Excellence Fellowship, Dean's Scholar Fellowship, National Science Foundation Research Traineeship, and Jefferson's Scholar

- Xiaomei Wang (advisee) won the Best Student Paper in Ergonomics in Design Article Award (which was based on her dissertation work) in 2020.

- Elliot Biltekoff (advisee) was honored won the Most Innovate Presentation at the 2021 Human Factors Engineering Inter-University Workshop.

- Elliot Biltekoff (advisee) won the Most Innovate Presentation at the 2021 Human Factors Engineering Inter-University Workshop.

- Under my faculty advisement and the leadership of Elliot Biltekoff (advisee), the UB HFES Student Chapter received the highest level of recognition (gold) from the national society in 2020.

- Xi Zheng (advisee) won the 2020 University at Buffalo's Department of Industrial and Systems Engineering Graduate Researcher of the Year Award.

- Meng Lee (advisee) won Best Student Paper in Human Performance Modeling at the 2018 HFES Annual Meeting.

- Kylie Moliaro (advisee) won Best Poster at the 2017 Human Factors Engineering Inter-University Workshop.

- Xi Zheng (advisee) won 2nd Best Student Paper in Human Performance Modeling at the 2017 HFES Annual Meeting.

- Xi Zheng (advisee) won 2nd place at the 2016 UB ISE Poster Competition.

- Adam Houser (advisee) won 2nd place at the 2015 UB ISE Poster Competition.

- Meng Li (advisee) won Best Poster at the 15th Annual Human Factors Engineering Inter-University Workshop.

- Judith Tiferes (mentee and coauthor) was a finalist for the HFES Alphonse Chapanis Student Paper Award.

V. Media Coverage

- My article Humanistic Engineering: Engineering for the People was featured by IEEE Technology and Society: https://tinyurl.com/he-ieee-tsm

- My medical alarm research was profiled in UIC Today (the online magazine of the University of Illinois at Chicago) on October 22, 2019: https://today.uic.edu/medical-alarms-may-be-inaudible-to-hospital-staff

- My collaborative project on ethics in Computer Science Education was featured on UBNow (the online magazine at the University at Buffalo) on June 20, 2019: https://tinyurl.com/y24p3a94

- My collaborative project on the ethics of AI was featured on UBNow (the online magazine at the University at Buffalo) on March 20, 2017: https://goo.gl/AGRvAo

- My medical alarm research was profiled in the in the Buffalo Engineering 2018 magazine.

- My formal method for human task behavior modeling and system safety analysis was highlighted in the NASA report titled "Assessment of the State-of-the-Art of System-Wide Safety and Assurance Technologies" https://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/20170011193.pdf

- WIVB, the local Buffalo CBS affiliate did a television news story on my medical alarm research which aired on March 28, 2017, at 5:41 pm: https://goo.gl/rzWj2F

- My medical alarm research was featured as the cover story on UBNow (the online magazine at the University at Buffalo) on March 20, 2017: https://goo.gl/hEuemM

- UB issued a press release covering my medical alarm research: https://goo.gl/cuUpLG

- Army Research Office Young Investigator Program Award covered in the Buffalo Engineering 2016 magazine.

- Medical alarm research profiled on the M&A Malpractice blog: http://goo.gl/qVnpJw and http://goo.gl/Jjk7sr

- Medical alarm research profiled on NetworkWorld's *Mobile Cloud Blog*, https://goo.gl/UJtnVH

- Interviewed for ARCTrends, the official blog of Arcadia Healthcare Solutions, http://tinyurl.com/q4j4oeb

- Lab profiled in Volume 20, No. 3, Fall 2014 of *Cognitia*, the newsletter of the Cognitive Engineering and Decision Making Technical Group of the Human Factors and Ergonomics Society

- Work profiled in the December 2013 issue of *Aerospace America* (see the 2nd and 3rd paragraphs on page 43), http://tinyurl.com/AADec2013
- Work profiled in the AIAA ISTC Fall 2013 Newsletter.
- Work profiled in the 2007 University of Virginia President's Report, https://goo.gl/N6xa6F

VI. Publications

In the below, my name is in **bold**. Mentored students are underlined. Corresponding author has a [C]. A product with [+] was written prior to UB. A product with [A] was written with my dissertation adviser.

Summary Statistics

Edited Volumes:	2	Book Chapters:	6	Journal Articles:	38
Refereed Conference Papers:	40	Other Conference Papers:	6	Refereed Abstracts:	8
Invited Talks:	41	Posters:	19		

Citation Indices (as of 1/10/2022)

Google Scholar:	Total Citations: 1463	h-index: 22	i10-index: 38
Web of Science:	Total Citations: 551	h-index: 13	

Edited Volumes

E1   Wu, C., Rothrock, L., & **Bolton, M. L.** (2020). Special issue on computational human performance modeling. *IEEE Transactions on Human-Machine Systems, 49*(6), 470- 578.

E2 [+]   **Bolton, M. L.**[C], Degani, A., & Palanque, P., eds. (2012). *Proceeding of the Workshop on Formal Methods in Human-Machine Interaction (Formal H)*, 47 pages. London: Imperial College.

Book Chapters

B1   **Bolton, M. L.**[C] & Gray, W. D. (ND). Cognitive Modeling for Cognitive Engineering. Accepted to Sun, R. (Ed.) *Cambridge Handbook of Computational Cognitive Sciences* (29 pages). Cambridge University Press, Cambridge. In Press.

B2 [A]   **Bolton, M. L.**[C] & Bass, E. J. (2017). Enhanced Operator Function Model (EOFM): A Task Analytic Modeling Formalism for Including Human Behavior in the Verification of Complex Systems. In Weyers, B., Bowen, J., Dix, A., & Palanque, P. (Eds.), *The Handbook of Formal Methods in Human-Computer Interaction* (pp. 343-377). Gewerbestrasse: Springer International.

B3 [+]   **Bolton, M. L.**[C] & Bass, E. J. (2011). Comparing perceptual judgment and subjective measures of spatial awareness. In E. Salas & A. S. Dietz (Eds.), *Situational Awareness: Critical Essays on Human Factors in Aviation* (pp. 211–221). Surrey: Ashgate.

   This is a reprint of: Bolton, M. L. & Bass, E. J. (2009). Comparing perceptual judgment and subjective measures of spatial awareness. *Applied Ergonomics*, *40*, 597–607.

B4 [+]   **Bolton, M. L.**[C], Klein, K. A., & Göknur, S. C. (2006). Navigation. In Strunk, E. A. & Knight, J. C. (Eds.), *Digital Avionics: A Computing Perspective* (pp. 15–26). Los Alamitos: IEEE Computer Society.

B5 [+]   Göknur, S. C.[C], Klein, K. A., & **Bolton, M. L.** (2006). Flight management systems. In Strunk, E. A. & Knight, J. C. (Eds.), *Digital Avionics: A Computing Perspective* (pp. 53–61). Los Alamitos: IEEE Computer Society.

B6 [+]   Klein, K. A.[C], Göknur, S. C., & **Bolton, M. L.** (2006). Autopilot flight director systems. In Strunk, E. A. & Knight, J. C. (Eds.), *Digital Avionics: A Computing Perspective* (pp. 45–52). Los Alamitos: IEEE Computer Society.

Journal Articles

Impact factors updated on 4/2/2018 or date of publication. JCR is from Thomas and Reuters. Cites/Doc and SJR are from Scimago. JCR and Cites/Doc use the same algorithm but different data.

		Impact Factor		
		JCR	Cites/Doc	SJR
J1	**Bolton, M. L.**[C], Biltekoff, E., & Humphrey, L. (ND). The Mathematical Meaningless-ness of the NASA Task Load Index: A Level of Measurement Analysis. In Press in *IEEE Transactions on Human-Machine Systems*, 10 pages.	4.124	4.60	1.08
J2	**Bolton, M. L.**[C] (ND). Trust is not a virtue: Why we should not trust trust. *Ergonomics in Design*, 8 pages. https://doi.org/10.1177/10648046221130171.	0.320	1.28	0.34
J3	**Bolton, M. L.**[C] (2022). Humanistic engineering: Engineering for the people. *IEEE Technology and Society Magazine, 41*(4), 23-38.	1.500	1.1	0.54
J4	**Bolton, M. L.**[C], Biltekoff, E., & Humphrey, L. (2022). The level of measurement of subjective situation awareness and its dimensions in the situation awareness rating technique (SART). *IEEE Transactions on Human-Machine Systems*, 52(6), 1147-1154.	4.124	4.60	1.08
J5	**Bolton, M. L.**[C], Edworthy, J., & Boyd, A. D. (2022). Masking between reserved alarm sounds of the IEC 60601-1-8 international medical alarm standard: A systematic, formal analysis. *Human Factors*, *64*(5), 835–851.	3.165	4.15	1.35
J6	**Bolton, M. L.**[C], Zheng, X., & Kang, E. (2021). A formal method for including the probability of erroneous human task behavior in system analysis. *Reliability Engineering & System Safety, 213*, 13 pages. doi: 10.1016/j.ress.2021.107764	5.040	7.03	1.72
J7	Wei, J., **Bolton, M. L.**[C], Humphry, L. (2021). The level of measurement of trust in automation. *Theoretical Issues in Ergonomics Science, 22,* 274-295. doi: 10.1080/1463922X.2020.1766596	0.490	2.08	0.53
J8	Zheng, X., **Bolton, M. L.**[C], Daly, C. (2020). Extended SAFPHR (Systems Analysis for Formal Pharmaceutical Human Reliability): Two Approaches Based on Extended CREAM and a Comparative Analysis. *Safety Science*, *132*, 18 pages. doi: 10.1016/j.ssci.2020.104944	4.105	5.46	1.24
J9	**Bolton, M. L.**[C], Zheng, X., Li, M., Edworthy, J. R., & Boyd, A. D. (2020). An experimental validation of masking in IEC 60601-1-8:2006-compliant alarm sounds. In Press in *Human Factors*, 20 pages. doi:10.1177/0018720819862911	2.857	3.28	1.09
J10	Zheng, X., **Bolton, M. L.**[C], Daly, C., & Biltekoff, E. (2020). The development of a next-generation human reliability analysis: systems analysis for formal pharmaceutical human reliability (SAFPHR). *Reliability Engineering & System Safety*, *202*, 15 pages. https://doi.org/10.1016/j.ress.2020.106927	4.039	6.68	1.93
J11	Wang, X.[C], Bisantz, A. M., Bolton, M. L., Cavuoto, L., & Chandola, V. (2020). Explaining supervised learning models: A preliminary study on binary classifiers. *Ergonomics in Design, 28*(3), 20-26.	0.47	0.34	0.88
J12	Wu, C., Rothrock, L., & **Bolton, M. L.** (2019). Editorial special issue on computational human performance modeling. *IEEE Transactions on Human-Machine Systems, 49*(6), 470-473.	3.332	4.57	0.84
J13	Bolton, M. L.[C], Houser, A., & Molinaro, K. (2019). A formal method for assessing the impact of task-based erroneous human behavior on system safety. *Reliability Engineering & System Safety*, *188*, 168-180.	4.139	4.66	1.66
J14	Edworthy, J. R.[C], McNeer, R. R., Bennett, C. L., Dudaryk, R., McDougall, S. J. P., Schlesinger, J. J., **Bolton, M. L.**, Edworthy, J. D., Vieira, E. O., Boyd, A. D., Reid, S. K. J., Rayo, M. F., Wright, M. C., & Osborn, D. (2018). Getting better hospital alarm sounds into a global standard. *Ergonomics in Design*, *26*(2), 4-13.	0.290	0.44	0.25
J15	**Bolton, M. L.**[C], Edworthy, J., Boyd, A. D., Wei, J., & Zheng, X. (2018). A computationally efficient formal method for discovering masking in concurrently sounding medical alarms. *Applied Acoustics*, *141*, 403-415.	1.921	2.16	0.82

J16	Molinaro, K., & **Bolton, M. L.**[C] (2018). Evaluating the applicability of the double system lens model to the analysis of phishing email judgments. *Computers and Security*, 17, 128-137.	2.849	3.50	0.87
J17	Houser, A., Ma, L. M., Feigh, K., & **Bolton, M. L.**[C] (2018). Using formal methods to reason about taskload and resource conflicts in simulated air traffic scenarios. *Innovations in Systems and Software Engineering*, *14*(1), 1-14.	0.420	1.12	0.37
J18	Pan, D., & **Bolton, M. L.**[C] (2018). Properties for formally assessing the performance level of human-human collaborative procedures with miscommunications and erroneous human behavior. *International Journal of Industrial Ergonomics*, *63*, 75-88.	1.415	1.51	0.56
J19	Yoon, J. M., He, D. & **Bolton, M. L.**[C] (2017). A LAMSTAR network-based human judgment analysis. *IEEE Transactions on Human-Machine Systems*, *47*(6), 951-957.	2.493	3.50	0.88
J20	Li, M., Wei, J.C[15], Zheng, X. & **Bolton, M. L.**[C] (2017). A formal machine learning approach to generating human-machine interfaces from task models. *IEEE Transactions on Human-Machine Systems*, *47*(6), 822-833.	2.493	3.50	0.88
J21	Wei, J. & **Bolton, M. L.**[C] (2017). Compression rates and spatial judgment biases made from synthetic vision perspective displays. *Journal of Aerospace Information Systems*, 14(10), 523-532.	0.892	1.34	0.39
J22	**Bolton, M. L.**[C] (2017). A task-based taxonomy of erroneous human behavior. *International Journal of Human-Computer Studies*, *108*, 105-121.	2.863	3.35	0.62
J23	**Bolton, M. L.**[C], Zehng, X., Molinaro, K., Houser, A., & Li, M. (2017). Improving the scalability of formal human-automation interaction verification analyses that use task analytic models. *Innovation in Systems and Software Engineering*, 13(1), 1-17.	0.042	1.12	0.37
J24	Hasanain, B., Boyd, A. D., & **Bolton, M. L.**[C] (2017). A formal approach to discovering simultaneous additive masking between auditory medical alarms. *Applied Ergonomics, 58,* 500-514.	1.866	2.11	0.87
J25	Hasanain, B., Boyd, A. D., & **Bolton, M. L.**[C] (2016). Using model checking to detect simultaneous masking in medical alarms. *IEEE Transactions on Human-Machine Systems, 46*(2), 174 - 185.	2.493	3.50	0.88
J26	**Bolton, M. L.**[C] (2015). Model checking human-human communication protocols using task models and miscommunication generation. *Journal of Aerospace Information Systems*, *12*, 476-489.	0.892	1.34	0.39
J27 [+]	**Bolton, M. L.**[C], Jimenez, N., van Paassen, M. M., & Trujillo, M. (2014). Automatically generating specification properties from task models for the formal verification of human-automation interaction. *IEEE Transactions on Human-Machine Systems, 44*(5), 561-575.	2.493	3.50	0.88
J28 [+A]	**Bolton, M. L.**, Göknur, S., & Bass, E.J. [C] (2013). Framework to support scenario development for human-centered alerting system evaluation. *IEEE Transactions on Human-machine Systems, 43*(6), 595-606.	2.493	3.50	0.88
J29 [+A]	**Bolton, M. L.**[C] & Bass, E. J. (2013). Generating erroneous human behavior from strategic knowledge in task models and evaluating its impact on system safety with model checking. *IEEE Transactions on Systems, Man and Cybernetics: Systems*, *43*(6), 1314-1327.	2.350	6.02	1.30
J30 [+]	**Bolton, M. L.** [C] (2013). Automatic validation and failure diagnosis of human-device interfaces using task analytic models and model checking. *Computational and Mathematical Organization Theory, 19*(3), 288-312.	0.769	0.80	0.37
J31 [+A]	**Bolton, M. L.**, Bass, E. J.[C], & Siminiceanu, R. I. (2013). Using formal verification to evaluate human-automation interaction in safety critical systems, a review. *IEEE Transactions on Systems, Man and Cybernetics: Systems, 43*(3), 488-503.	2.350	6.02	1.30
J32 [+A]	**Bolton, M. L.**[C], & Bass, E. J (2012). Using model checking to explore checklist-guided pilot behavior. *International Journal of Aviation Psychology, 22*(4), 343-366.	0.950	0.33	0.20

J33 [+A] **Bolton, M. L.**[C], Bass, E. J., & Siminiceanu, R. I. (2012). Generating phenotypical erroneous human behavior to evaluate human–automation interaction using model checking. *International Journal of Human-Computer Studies*, *70*(11), 888–906.   2.863 3.35 0.62

J34 [+A] **Bolton, M. L.**[C], Siminiceanu, R. I., & Bass, E. J. (2011). A systematic approach to model checking human-automation interaction using task analytic models. *IEEE Transactions on Systems, Man and Cybernetics, Part A: Systems and Humans*, *41*(5), 961–976.   2.123 from 2012 3.75 1.13

J35 [+A] **Bolton, M. L.**[C], & Bass, E. J. (2010). Formally verifying human-automation interaction as part of a system model: Limitations and tradeoffs. *Innovations in Systems and Software Engineering, 6*(3), 219–231.   -- 1.12 0.37

J36 [+A] **Bolton, M. L.**[C] & Bass, E. J. (2009). Comparing perceptual judgment and subjective measures of spatial awareness. *Applied Ergonomics*, *40*, 597–607.   1.866 2.11 0.87

> Reprinted (invited) as: Bolton, M. L., & Bass, E. J. (2011). Comparing perceptual judgment and subjective measures of spatial awareness. In E. Salas & A. S. Dietz (Eds.), *Situational Awareness: Critical Essays on Human Factors in Aviation* (pp. 211–221). Surrey: Ashgate.

J37 [+A] **Bolton, M. L.**[C] & Bass, E. J. (2008). Using relative position and temporal judgments to identify biases in spatial awareness for synthetic vision systems. *International Journal of Aviation Psychology*, *18*(2), 183–206.   0.950 0.33 0.20

J38 [+A] **Bolton, M. L.**[C], Bass, E. J., & Comstock, J. R. (2007). Spatial awareness in synthetic vision systems: Using spatial and temporal judgments to evaluate texture and field of view. *Human Factors*, *49*, 961–974.   2.219 2.13 0.80

> One of the 10 most cited papers published in *Human Factors* in 2006–2007.

Journal Articles Under Review

JR1   Houser, A. & **Bolton, M. L.**[C] (ND). Formal mental models for human-centered cybersecurity. Under review in *IEEE Transactions on Human-Machine Systems,* 13 pages.

JR2   Bonacquisti, E., Ferguson, S., Jasiewicz, N., Wang, J., Brown, A., Keeley, D., Itano, M., Bolton, M. L., Hahn, K., & Nguyen, J.[C] (ND) Fluorogenic EXO-probe aptamers for imaging and tracking exosomal RNAs. Submitted to *Proceedings of the National Academy of Sciences*.

Journal Articles in Preparation

JP1   Houser, A. & **Bolton, M. L.**[C] (ND). Predicting cybersecurity problems with formal, folk, mental models.

JP2   Taylor, S. & **Bolton, M. L.**[C] (ND). Workload does not work: A review of the limitations of the NASA task load index.

Peer Reviewed Conference Papers

In the below, a * indicates the presenting author.

C1   Zhang, C.*, Saluja, T., Meira-Góes, R., **Bolton, M. L.**, Garlan, D., & Kang, E.[C] (2023). Robustification of behavioral designs against environmental deviations. Proceedings of the IEEE/ACM 45th International Conference on Software Engineering. In press.

C2   **Bolton, M. L.***, Biltekoff, E., & Byrne, K. (2022). Fuzzy mental model finite state machines: A mental modeling formalism for assessing mode confusion and human-machine "trust". In *2022 IEEE 3rd International Conference on Human-Machine Systems* (4 pages). IEEE: Piscataway.

C3   **Bolton, M. L.***, Biltekoff, E., Wei, J., & Humphrey, L. (2022). On the level of measurement of subjective psychometric Ratings. In *Proceedings of the Human Factors and Ergonomics Society Annual Meeting* (80-84). Sage: Los Angeles.

C4   **Bolton, M. L.*** (2022). Preliminary Evidence of Sexual Bias in Voice over Internet Protocol Audio Compression. Proceedings of *HCI International* (pp. 227-237). Springer: Cham.

C5   Wan, P. & **Bolton, M. L.*** (2021). A taxonomy of forcing functions for addressing human errors in human-machine interaction. *Proceedings of the IEEE International Conference on Systems Man and Cybernetics* (6 pages). IEEE: Piscataway.

C6   Wang, X.[C], Bisantz, A. M., Bolton, M. L., Cavuoto, L., & Chandola, V. (2020). Cognitive Work Analysis and Visualization Design for the Graduate Admission Decision Making Process. *Proceedings of the 2020 International Annual Meeting of the Human Factors and Ergonomics Society* (pp. 815-819). Sage: Thousand Oaks.

C7   Li, M. & **Bolton, M. L.**[C]* (2019). Task-based automated test case generation for human-machine interaction. *Proceedings of the 2019 International Annual Meeting of the Human Factors and Ergonomics Society* (pp. 807-811). Sage: Thousand Oaks.

C8   Wei, J., **Bolton, M. L.**[C]*, & Humphrey, L. (2019). Subjective measurement of trust: Is it on the level? *Proceedings of the 2019 International Annual Meeting of the Human Factors and Ergonomics Society* (pp. 212-216). Sage: Thousand Oaks.

C9   Molinaro, K. [C]* & **Bolton, M. L.** (2019). Using the lens model and cognitive continuum theory to understand the effects of cognition on phishing victimization. *Proceedings of the 2019 International Annual Meeting of the Human Factors and Ergonomics Society* (pp. 173-177). Sage: Thousand Oaks.

C10   Ma, L. M., Houser, A., Feigh, K., & **Bolton, M. L.**[C]* (2019). An analysis of air traffic management concepts of operation using simulation and formal verification. *AIAA SciTech Forum* (15 pages). Reston, AIAA.

C11   Li, M.*, Behdad, Sara, & **Bolton, M. L.** [C] (2018). A formal methods approach to predicting how users will utilize system features. *Proceedings of the 2018 International Annual Meeting of the Human Factors and Ergonomics Society* (pp. 641-645). Sage: Thousand Oaks.

       Winner of the Best Student Paper in Human Performance Modeling.

C12   **Bolton, M. L.***[C], Edworthy, J., & Boyd, A. D. (2018). A formal analysis of masking between reserved alarm sounds of the IEC 60601-1-8 international medical alarm standard. *Proceedings of the 2018 International Annual Meeting of the Human Factors and Ergonomics Society* (pp. 523-527). Sage: Thousand Oaks.

C13   Zheng, X.*, **Bolton, M. L.**[C], Daly, C., & Feng, L. (2017). A formal human reliability analysis of a community pharmacy dispensing procedure. . *Proceedings of the Human Factors and Ergonomics Society Annual Meeting* (pp. 728-732). Sage: Thousand Oaks.

       Winner of 2nd Best Student Paper in Human Performance Modeling.

C14   **Bolton, M. L.***[C] (2017). Novel developments in formal methods for human factors engineering. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting* (pp. 715-717). Sage: Thousand Oaks.

C15   Houser, A.* & **Bolton, M. L.** [C] (2017). Formal mental models for inclusive privacy and security. *Proceedings of the Symposium on Usable Privacy and Security (SOUPS)* (3 pages). Santa Clara: USENIX.

C16   Tiferes, J.* [C], Bisantz, A. M., **Bolton, M. L.**, Higginbotham, D. J., O'Hara, R. P., Wawrzyniak, N. K., Kozlowski, J. D., Ahmad, B., Hussein, A. A., & Guru, K. A. (2016). Multimodal team interactions in robot-assisted surgery. *Proceedings of the 2016 International Annual Meeting of the Human Factors and Ergonomics Society* (pp. 518-522). Sage: Thousand Oaks.

       Finalist for the Alphonse Chapanis Student Paper Award.

C17   **Bolton, M. L.***[C], Hasanain, B., Boyd, A. D., & Edwothy, J. (2016). Using model checking to detect masking in IEC 60601-1-8-compliant alarm configurations. *Proceedings of the 2016 International Annual Meeting of the Human Factors and Ergonomics Society* (pp. 636-640). Sage: Thousand Oaks.

C18   Houser, A., Ma, L. M., Feigh, K., & **Bolton, M. L.***[C] (2015). A formal approach to modeling and analyzing human taskload in simulated air traffic scenarios. In *Proceedings of the IEEE International Conference on Complex Systems Engineering* (6 pages). Piscataway: IEEE.

C19   Li, M., Molinaro, K., & **Bolton, M. L.***[C] (2015). Learning formal human-machine interface designs from task analytic models. In *Proceedings of the HFES Annual Meeting* (pp. 652-656). Sage: Thousand Oaks.

C20   van Paassen*[C], M. M., **Bolton, M. L.**, Jimenez, N. (2014). Checking formal verification models for human-automation interaction. In *Proceedings of the IEEE International Conference on Systems Man and Cybernetics* (pp. 3709-3714). Piscataway: IEEE.

C21   Hasanain, B., Boyd, A. D., & **Bolton, M. L.***[C] (2014). An approach to model checking the perceptual inter-actions of medical alarms. In *Proceedings of the 2014 International Annual Meeting of the Human Factors and Ergonomics Society* (pp. 822-826). Sage: Thousand Oaks.

C22   **Bolton, M. L.***[C], Ebrahimi, S. (2014). An approach to generating human-computer interfaces from task models. In *Proceedings of AAAI 2014 Symposium on Modeling in Human-machine Systems: Challenges for Formal Verification* (pp. 92-97). Palo Alto: AAAI.

C23 [+A]   Bass, E. J.*[C], Brantley, K., Perez, T., **Bolton, M. L.**, Helms, A., Bartel, L. (2013). Information, data entry, and reporting requirements for a resident handoff of care support tool. In *Proceedings of the IEEE International Conference on Systems Man and Cybernetics* (pp. 675-680). Piscataway: IEEE.

C24 [+]   **Bolton, M. L.***[C], Jimenez, N., van Paassen, M. M., & Trujillo, M. (2013). Formally verifying human-automation interaction with specification properties generated from task analytic models. In *Proceedings of the Sixth IAASS Conference* (8 pages). Noordwijk: ESA Communications.

C25 [+]   **Bolton, M. L.***[C], & Bass, E. J. (2013). Evaluating human-human communication protocols with miscommunication generation and model checking. In *Proceedings of the Fifth NASA Formal Methods Symposium* (pp. 48–62). Moffett Field: NASA Ames Research Center.

C26 [+]   **Bolton, M. L.**[C], Wallace, C. M., & Zuck, L. D.* (2012). On policies and intents. In *Proceedings of the Eighth International Conference on Information Systems Security* (pp. 104–118). Berlin: Springer.

C27 [+A]   Bass, E. J.[C], **Bolton, M. L.**, Feigh, K., Griffith, D.*, Gunter, E., Mansky, W., & Rushby, J. (2011). Toward a multi-method approach to formalizing human-automation interaction and human-human communications. In *Proceedings of the IEEE International Conference on Systems Man and Cybernetics* (pp. 1817–1824). Piscataway: IEEE.

C28 [+A]   **Bolton, M. L.***[C] & Bass, E. J. (2011). Using task analytic behavior models, strategic knowledge-based erroneous human behavior generation, and model checking to evaluate human-automation interaction. In *Proceedings of the IEEE International Conference on Systems Man and Cybernetics* (pp. 1788–1794). Piscataway: IEEE.

      Winner of the Franklin V. Taylor Memorial Award for the Best Conference Paper (out of 612 accepted papers).

C29 [+A]   **Bolton, M. L.***[C] (2011). Validating human-device interfaces with model checking and temporal logic properties automatically generated from task analytic models. In *Proceedings of the 20th Behavior Representation in Modeling and Simulation Conference* (pp. 130–137). Sundance: The BRIMS Society.

      Winner of a best paper award (out of 24 accepted papers).

C30 [+A]   **Bolton, M. L.***[C], & Bass, E. J. (2010). Using task analytic models and phenotypes of erroneous human behavior to discover system failures using model checking. In *Proceedings of the 54th Annual Meeting of the Human Factors and Ergonomics Society* (pp. 992–996). Sage: Thousand Oaks.

C31 [+A]   **Bolton, M. L.**[C], & Bass, E. J.* (2010). Using task analytic models to visualize model checker counterexamples. In *Proceedings of the IEEE International Conference on Systems Man and Cybernetics* (pp. 2069–2074). Piscataway: IEEE.

C32 [+A]   **Bolton, M. L.***[C], & Bass, E. J. (2009). A method for the formal verification of human interactive systems. In *Proceedings of the 53rd Annual Meeting of the Human Factors and Ergonomics Society* (pp. 764–768). Sage: Thousand Oaks.

C33 [+A]   **Bolton, M. L.**, & Bass, E. J.*[C] (2009). Enhanced operator function model: A generic human task behavior modeling language. In *Proceedings of the IEEE International Conference on Systems Man and Cybernetics* (pp. 2983–2990). Piscataway: IEEE.

C34 [+A]   **Bolton, M. L.***[C], & Bass, E. J. (2009). Building a formal model of a human-interactive system: Insights into the integration of formal methods and human factors engineering. In *Proceedings of the First NASA Formal Methods Symposium* (pp. 6–15). Moffett Field: NASA Ames Research Center.

      One of the 7 best papers (out of 22 invited to submit an extended manuscript as a journal article.

C35 [+]   **Bolton, M. L.**[C] (2008). Modeling human perception: Could Stevens' power law be an emergent feature? In *Proceedings of IEEE the International Conference on Systems Man and Cybernetics* (pp. 1073–1078). Piscataway: IEEE.

C36 [+A] **Bolton, M. L.**[*C] & Bass, E. J. (2007). Spatial awareness: Comparing judgment-based and subjective measures. In *Proceedings of IEEE the International Conference on Systems Man and Cybernetics* (pp. 2582–2587). Piscataway: IEEE.

C37 [+A] **Bolton, M. L.**[*C], Bass, E. J., & Comstock, J. R. (2006). Using relative position and temporal judgments to assess the effects of texture and field of view on spatial awareness in synthetic vision systems displays. In *Proceedings of the 50th Annual Meeting of the Human Factors and Ergonomics Society* (pp. 961–974). Sage: Thousand Oaks.

C38 [+A] **Bolton, M. L.**[*C], Bass, E. J., & Comstock, J. R. (2006). Using videos derived from simulations to support the analysis of spatial awareness in synthetic vision displays. In *Proceedings of the IEEE International Conference on Systems Man and Cybernetics* (pp. 2582–2587). Piscataway: IEEE.

C39 [+A] **Bolton, M. L.**[*C] & Bass, E. J. (2005). Cognitive Systems Engineering Educational Software (CSEES): Educational software addressing quantitative models of performance. In *Proceedings of the IEEE International Conference on Systems Man and Cybernetics* (pp. 3380–3386). Piscataway: IEEE.

C40 [+A] Göknur, S.[*C], **Bolton, M. L.**, & Bass, E. J. (2004). Adding a motor control component to the Operator Function Model Expert System to investigate air traffic management concepts using simulation. In *Proceedings of the IEEE International Conference on Systems Man and Cybernetics* (pp. 886–892). Piscataway: IEEE.

Other Conference Papers

In the below, a * indicates the presenting author.

OC1 Hall, C.*, **Bolton, M. L.**[C] (2023). Can you hear me? Simultaneous masking between the STARS air traffic control alarms. Accepted to *2023 meeting of the International Symposium of Aviation Psychology*.

OC2 Pan, D.*, **Bolton, M. L.**[C] (2015). A formal method for evaluating the performance level of human-human collaborative procedures. In *Proceedings of HCI International 2015* (pp. 186-197). Berlin: Springer.

OC3 [+A] **Bolton, M. L.**[* C], Bass, & E. J., Siminiceanu, R. I. (2008). Using formal methods to predict human error and system failures. In *Proceedings of the Second International Conference on Applied Human Factors and Ergonomics* (10 pages). Las Vegas: Applied Human Factors and Ergonomics International.

OC4 [+A] **Bolton, M. L.**[*C] & Bass, E. J. (2007). Spatial awareness biases in synthetic vision systems displays. In *Proceedings of the 14th International Symposium on Aviation Psychology* (pp. 63–69). Dayton: Association for Aviation Psychology.

OC5 [+A] **Bolton, M. L.**[*C], Bass, E. J., & Comstock, J. R. (2006). A toolset to support the development of spatial and temporal judgment experiments for synthetic vision systems. In *Proceedings of the IEEE Systems and Information Engineering Design Symposium* (pp. 55–60). Piscataway: IEEE.

OC6 [+A] **Bolton, M. L.**[C], Hagan, T.*, Kustu, D.*, LaChance, L.*, Li, S.*, & Bass, E. J. (2006). Assessment and enhancement of synthetic vision systems experimentation software. In *Proceedings of the IEEE Systems and Information Engineering Design Symposium* (pp. 61–66). Piscataway: IEEE.

> Winner of the best paper award for the Human Computer Interface track.

Peer Reviewed Abstracts

In the below, a * indicates the presenting author and a [C] indicates the corresponding author.

A1 **Bolton, M. L.**[*C], Darget, T., Biltekoff, E., Edworthy, J., Boyd, A. (2020). Medical Alarm Audibility System Checker (MAASC): A computational tool for checking medical alarm configurations for simultaneous masking (pp. 302-303). *Proceedings of the International Symposium on Human Factors and Ergonomics in Health Care*. Sage: Thousand Oaks.

A2 Molinaro, K.[*C] & **Bolton, M. L.** (2019). Applying the lens model and cognitive continuum theory to the analysis of phishing email judgments (pp. 21-23). *The Brunswick Society Newsletter, 34*. Albany: The Brunswick Society.

A3 Molinaro, K.[*C] & **Bolton, M. L.** (2018). Applying the lens model and cognitive continuum theory to the analysis of phishing email judgments (pp. 22-25). *The Brunswick Society Newsletter, 33*. Albany: The Brunswick Society.

A4   Wang, X.*[C], Bisantz, A., **Bolton, M. L.**, Cavuoto, L., Chandola, V. (2018). Towards Better Interpretability of Machine Learning-based Decision Support Systems (1 page). *Proceedings of the AHFE 2018 International Conference on Human Factors and Systems Interaction*. Berlin: Springer.

A5   **Bolton, M. L.***[C] (2015). Formal methods for human-systems engineering. In *Proceedings of the Industrial & Systems Engineering Research Conference* (1 page). Norcross: Institute of Industrial Engineers.

A6 [+A] Bass, E. J.*[C], **Bolton, M. L.**, Feigh, K. M., Gunter, E. L., & Rushby, J. (2012). Toward an integrated model checking, theorem proving and simulation framework for analyzing authority and autonomy. In *Proceeding of the Workshop on Formal Methods in Human-Machine Interaction (Formal H)* (pp. 1–4). London: Imperial College.

A7 [+A] **Bolton, M. L.***[C] & Bass, E. J. (2012). Model checking human-automation interaction with enhanced operator function model. In *Proceeding of the Workshop on Formal Methods in Human-Machine Interaction (Formal H)* (pp. 34–36). London: Imperial College.

A8 [+A] **Bolton, M. L.***[C], & Bass, E. J. (2008). Formal modeling of erroneous human behavior and its implications for model checking. In *Proceedings of the Sixth NASA Langley Formal Methods Workshop* (pp. 62–64). Hampton: NASA Langley Research Center.

Invited Talks and Presentations

T1   **Bolton, M. L.** (2023, Mar. 07). *Humanistic Engineering: Engineering for the People*. Presented at the Yale Technology and Ethics Meeting, Yale University, Yale Interdisciplinary Center for Bioethics, New Haven, VT (presented remotely).

T2   **Bolton, M. L.** (2021, Nov. 03). *The Level of Measurement of the NASA Task Load Index and its Constituent Dimensions*. Presented at the Department Of Defense Measuring Human-Machine (AI) Interactions Technical Exchange Meeting, Virtual.

T3   **Bolton, M. L.** (2021, April 28). *Using Formal Methods and Human Performance Modeling to Engineer Safe and Secure Systems*. Presented at the Department of Engineering Systems and Environment, University of Virginia, Charlottesville, VA (presented remotely).

T4   **Bolton, M. L.***[C] (2021, April 14). *Automated Test Case Generation for Human-Machine Interaction*. Presented at the DATAWorkers: Defense and Aerospace Test and Analysis Workshop, Virtual.

T5   **Bolton, M. L.***[C] (2021, March 22). Task Models: A Possible Tool for Formally Modeling and Proving Properties about Artificial Intelligence and Machine Learning in Systems Engineering. *2021 AAAI Spring Symposium Series: Leveraging Systems Engineering to Realize Synergistic AI/Machine Learning Capabilities*. AAAI: Stanford (presented remotely).

T6   **Bolton, M. L.** (2020, April 10). *Humanistic Engineering: A Transformative Research and Education Agenda for a Better Future*. Presented at the Department of Industrial & Systems Engineering Brown Bag Seminar Series, University at Buffalo, Buffalo, NY.

T7   **Bolton, M. L.** (2019, Nov 8). *A Formal Analysis of Masking Between Alarm Sounds of the International Medical Alarm Standard*. Presented at the Department of Industrial & Systems Engineering, University of Wisconsin, Madison, WI.

T8   **Bolton, M. L.**, Wei, J. (2019, July 17). *The Measurement Scales of Psychometric Ratings*. Presented at the Universal Technologies Corporation and AFRL Collaborative Research and Development for Innovative Aerospace Leadership (CRDInAL), Beavercreek, OH.

T9   **Bolton, M. L.**, Zheng, X., Li, M., Edworthy, J. R., & Boyd, A. D. (2019, March 11). *An Experimental Validation of Masking Predictions in IEC 60601-1-8-compliant Alarm Sounds*. Presented at the 2020 Human Factors and Ergonomics in Health Care Symposium, Chicago, IL.

T10   **Bolton, M. L.** (2019, Jan. 22). *Using Formal Methods and Human Performance Modeling to Engineer Safe and Effective Systems*. Presented at the Department of Industrial and Operations Engineering, University of Michigan, Ann Arbor, MI.

T11   **Bolton, M. L.** (2019, Jan. 17). *Using Formal Methods and Human Performance Modeling to Engineer Safe and Effective Systems*. Presented at the Department of Computer Science, North Carolina State University, Raleigh, NC.

T12   **Bolton, M. L.** (2018, Oct. 30). *Using Formal Methods and Human Performance Modeling to Engineer Safe and Effective Systems*. Presented at the Department of Industrial and Systems Engineering, University of Florida, Gainesville, FL.

T13   **Bolton, M. L.** (2018, Oct. 19). *Using Formal Methods and Human Performance Modeling to Engineer Safe and Effective Systems*. Presented at the Department of Integrated Systems Engineering, Ohio State University, Columbus, OH.

T14   **Bolton, M. L.** (2018, Aug. 15). *Using Formal Methods and Human Performance Modeling to Engineer Safe and Effective Complex Systems*. Presented at the Edward P. Fitts Department of Industrial and Systems Engineering, North Carolina State University, Raleigh, NC.

T15   **Bolton, M. L.,** Wei, J. (2018, July 17). *The Measurement Scales of Psychometric Ratings*. Presented at the Universal Technologies Corporation and AFRL Collaborative Research and Development for Innovative Aerospace Leadership (CRDInAL), Beavercreek, OH.

T16   **Bolton, M. L.** (2018, Jan. 11). *Preventing Complex Failures of Human Interaction Systems*. Presented at the ARO Life Sciences Division Program Review, Cocoa Beach, FL.

T17   **Bolton, M. L.** (2017, Nov. 14). *The Formal Human Systems Lab*. Presented at the Reliable Autonomy for Human-Cyber-Physical Systems NSF CPS PI Meeting Mini-Workshop, Alexandria, VA.

T18   **Bolton, M. L.** (2017, Nov. 2). *Provably Safe: Using Formal Methods to Human-proof Complex Systems*. Presented at the STEM Forum (a venue for introducing local high school teachers to emerging STEM concepts), Buffalo, NY.

T19   **Bolton, M. L.** (2017, Feb. 15). *Using Human Behavior Modeling and Model Checking to Discover Failures in Safety Critical Systems*. Presented at the Cognitive Science Colloquia Series, UB Center for Cognitive Science, University at Buffalo, State University of New York, Buffalo, NY.

T20   **Bolton, M. L.** (2016, June 19). *A Formal Task-based Approach for Ensuring Trustworthy Human-Automation Interaction.* Presented at the workshop on Social Trust in Autonomous Robots, University of Michigan, Ann Arbor, MI.

T21   **Bolton, M. L.** (2016, April 18). *The Formal Human Systems Lab.* Presented at the Workshop on the Integration of Control Theory, Formal Methods, Learning and Human Factors for Autonomous Systems, University of Texas at Austin, Austin, TX.

T22   **Bolton, M. L.** & Topcu, U. (2016, April 18). *How do human factors, learning, and controls look from the perspective of formal methods?* Presented at the Workshop on the Integration of Control Theory, Formal Methods, Learning and Human Factors for Autonomous Systems, University of Texas at Austin, Austin, TX.

T23   **Bolton, M. L.** (2015, June 2). *Formal Methods for Human-Systems Engineering.* Presented as part of an invited panel discussion on Current Issues and Future Trends in Human-Systems Engineering Research at the Industrial & Systems Engineering Research Conference at the IIE Annual Conference and Expo, Nashville, TN.

T24   **Bolton, M. L.**, Jimenez, N., & van Paassen, M. M. (2014, April 9). *Verification models for advanced human-automation interaction*. Presented at ESTEC: European Space Research and Technology Centre, Noordwijk, NL.

T25 [+]   **Bolton, M. L.** (2013, July 12). *Using human behavior modeling and model checking to discover failures in safety critical systems*. Presented to the Department of Systems Design Engineering, University of Waterloo, Waterloo, ON, CA.

T26 [+]   **Bolton, M. L.** (2013, July 3). *Using human behavior modeling and model checking to discover failures in safety critical systems*. Presented to the Department of Industrial and Systems Engineering, State University of New York, Buffalo, NY.

T27 [+]   **Bolton, M. L.** (2013, February 25). *Using human behavior modeling and model checking to discover failures in safety critical systems*. Presented to the Biomedical and Health Informatics Colloquia, Center for Clinical and Translational Research, University of Illinois at Chicago, Chicago, IL.

T28 [+]   **Bolton, M. L**. (2012, October 31). *Using human behavior modeling and model checking to discover failures in safety critical systems*. Presented to the Electronic Visualization Laboratory, Department of Computer Science, University of Illinois at Chicago, Chicago, IL.

T29 [+]   **Bolton, M. L.** (2012, April 19). *Using human behavior modeling and model checking to discover failures in safety critical systems*. Presented to the Department of Mechanical and Industrial Engineering, University of Illinois at Chicago, Chicago, IL.

T30 [+]   **Bolton, M. L.** (2012, February 29). *Using human behavior modeling and model checking to discover failures in safety critical systems*. Presented to the Department of Engineering Management and Systems Engineering, George Washington University, Washington, D.C.

T31 [+]   **Bolton, M. L.** (2010, September 15). *Using task analytic models and phenotypes of erroneous human behavior to discover system failures using model checking*. Presented at the NASA Ames Research Center, Moffett Field, CA.

T32 [+]   **Bolton, M. L.** (2009, September 23). *A method for the formal verification of human-interactive systems*. Presented at the NASA Ames Research Center, Moffett Field, CA.

T33 [+]   **Bolton, M. L.** (2009, April 12). *Using formal methods to predict human error and system failures*. Presented at SRI International, Menlo Park, CA.

T34 [+]   **Bolton, M. L.** (2008, October 15). *Using formal methods to predict human error and system failures*. Presented at the Virginia Tech human factors research symposium, Blacksburg, VA.

T35 [+]   **Bolton, M. L.** (2008, July 9) *Using formal methods to predict human error and system failures*. Presented at The National Library of Medicine training conference, Bethesda, MD.

T36 [+]   **Bolton, M. L.** (2007, November 16). *Using formal methods to predict human error and system failures*. Presented at the NASA Langley Research Center, Hampton, VA.

T37 [+]   **Bolton, M. L.** (2007, September 21). *Using formal methods to predict human error and system failures*. Presented at the medical informatics colloquium, Charlottesville, VA.

T38 [+]   **Bolton, M. L.** (2007, April 16). *A framework for human centered systems evaluation*. Presented to Washington Metro ARCS, Charlottesville, VA.

T39 [+]   **Bolton, M. L.** (2007, January 16). *Using relative position and temporal judgments to assess spatial awareness for synthetic vision systems displays*. Presented at the NASA Langley Research Center, Hampton, VA.

T40 [+]   **Bolton, M. L.** (2006, April 15). *An investigation of the effects of texture and field of view on spatial awareness in synthetic vision head-down displays*. Presented to Washington Metro ARCS, Charlottesville, VA.

T41 [+]   **Bolton, M. L.** (2005, September 23). *Tools for supporting spatial and temporal judgment experiments for synthetic vision systems*. Presented at the National Institute of Aerospace, Hampton, VA.

Posters

In the below, a * indicates the presenting author.

P1   Giovanna, C.* & Bolton, M. L. (2023, February 24). Evaluating Technology to Improve Tactile Navigation Underwater & In Extreme Environments. Presented at the University of Virginia, Department of Engineering Systems and Environment Research Symposium, Charlottesville, VA.
(prepared but not presented due to covid)

P2   Wan, P.* & Bolton, M. L. (2020, December 17). A Taxonomy of Forcing Functions for Addressing Human Errors in Human-machine Interaction. Presented at the University at Buffalo, State University of New York, Department of Industrial and Systems Engineering Poster Competition, Buffalo, NY.

P3   Biltekoff, E.* & **Bolton, M. L.** (2020, February 19). *Virtue Ethics Inspired Formalism Based on Fuzzy Logic*. Presented at the University at Buffalo, State University of New York, Department of Industrial and Systems Engineering Poster Competition, Buffalo, NY.

P4   Zheng, Xi.*, **Bolton, M. L.**, & Daly, C. (2020, February 19). *SAFPHR: System Analysis for Pharmaceutical Human Reliability*. Presented at the University at Buffalo, State University of New York, Department of Industrial and Systems Engineering Poster Competition, Buffalo, NY.

P5   Molinaro, K.*, & **Bolton, M. L.** (2017, November 11). *Evaluating the Applicability of the Double System Lens Model to the Analysis of Phishing Email Judgments*. Presented at the 2017 Inter University Workshop. University at Buffalo, State University of New York, Buffalo, NY.

> Winner of the best poster award.

P6   Biltekoff, E.*, Zheng, X., Daly, C., & **Bolton, M. L.** (2017, November 11). *Survey Development for Formal Human Reliabiltiy*. Presented at the 2017 Inter University Workshop. University at Buffalo, State University of New York, Buffalo, NY.

P7   Zheng, X.*, **Bolton, M. L.**, Daly, C., & Feng, L. (2017, March 31). *A Formal Human Reliability Analysis of a Community Pharmacy Dispensing Procedure*. University at Buffalo, State University of New York, Department of Industrial and Systems Engineering Poster Competition, Buffalo, NY.

> Voted 2nd best poster.

P8   **Bolton, M. L.**, Bisantz, A., Cavuoto, L., Wu, S., & Paquet, V. (2016, September 20) *Human Factors Engineering at UB*. Poster Session presented at the 2016 International Annual Meeting of the Human Factors and Ergonomics Society, Washington DC.

P9   Houser, A. *, Ma, L. M., Feigh, K., & **Bolton, M. L.** (2016). *A formal approach to modeling and analyzing human taskload in simulated air traffic scenarios*. University at Buffalo, State University of New York, Department of Industrial and Systems Engineering Poster Competition, Buffalo, NY.

> Voted 2nd best poster.

P10   Jiajun, W. * & **Bolton, M. L.** (2016). *Investigating the Relationship Between Compression Rates and Biases in Spatial Judgments in Perspective Displays*. University at Buffalo, State University of New York, Department of Industrial and Systems Engineering Poster Competition, Buffalo, NY.

P11   **Bolton, M. L.***, Bisantz, A., Cavuoto, L.*, Wu, S., & Paquet, V. (2015, October 29) *Human Factors Engineering at UB*. Poster Session presented at the 2015 International Annual Meeting of the Human Factors and Ergonomics Society, Chicago, IL.

P12   Li, M.* & Bolton, M. L. (2015, April 3) *An Approach to Generating Human-computer Interfaces from Task Models*. University at Buffalo, State University of New York, Department of Industrial and Systems Engineering Poster Competition, Buffalo, NY.

P13   Li, M.* & **Bolton, M. L.** (2014, November 15) *An Approach to Generating Human-computer Interfaces from Task Models.* Poster session presented at the 15th Annual Human Factors Engineering Inter-University Workshop, Buffalo, NY.

> Winner of the best poster award.

P14   **Bolton, M. L.***, Bisantz, A., Cavuoto, L., Wu, S., & Paquet, V. (2014, October 30) *Human Factors Engineering at UB*. Poster Session presented at the 2014 International Annual Meeting of the Human Factors and Ergonomics Society, Chicago, IL.

P15   **Bolton, M. L.***, Ebrahimi, S., & Li, M. (2014, March 23) *An Approach to Generating Human-computer Interfaces from Task Models.* Poster session presented at the AAAI 2014 Symposium on Modeling in Human-machine Systems: Challenges for Formal Verification, Stanford, CA.

P16   **Bolton, M. L.*** (2012, October 25) *The Systems Engineering and Human Performance Modeling Laboratory: University of Illinois at Chicago*. Poster session presented at the 56th Annual meeting of the Human Factors and Ergonomics Society, Boston, MA.

P17 [+A] **Bolton, M. L.*** & Bass, E.J. *A methodology for the formal verification of medical, human-interactive systems*. Poster session presented at:

> (2009, June 5).   The 2009 NLM Trainee-Mentor-Advisory Board Meeting, Charlottesville, VA.
> (2009, July 23).   The NLM Informatics Training Conference, Portland, OR.
> (2010, May 28).   The 2010 NLM Trainee-Mentor-Advisory Board Meeting, Charlottesville, VA.

P18 [+A] **Bolton, M. L.***, Guerlain, S., Gerling, G. J., & Bass, E. J. (2008, September 23). *University of Virginia: Human Factors*. Poster session presented at the 52nd Annual meeting of the Human Factors and Ergonomics Society, New York, NY.

P19 [+A] **Bolton, M. L.*** & Bass, E. J. (2008, May 6). *A formal methods approach to modeling the contribution of human error to system failure: A Therac-25 example*. Poster session presented at the 2008 NLM Trainee-Mentor-Advisory Board Meeting, Charlottesville, VA.

VII.   Grant Activity

Total Secured Funds (across all projects and institutions): $4,579,993
Total Secured External Funds (across all projects and institutions): $4,539,993
Total Secured External Funds as PI/Institutional PI/CoPI: $2,425,914
Total Secured Internal Funds: $ 40,000

Current External Grants

GC1   A Formal Method for Analyzing Human Taskload and Task Interference in Human-autonomy Interaction
   Sponsor: AFRL (Air Force)
   PI: **Matthew L. Bolton**
   Amount: $200,000
   Date: 4/2021 – 4/2023

GC2   FMitF: Collaborative Research: Track I: A Formal Approach to Preventing Human Error in Cyber-human Systems with Human Reliability Rating and Model Repair
   Sponsor: NSF
   PI: **Matthew L. Bolton**
   Award Amount: $375,000
   Date: 8/26/2019-8/25/2023

GC3   Supplement (Undergraduate Research): GC2 FMitF: Collaborative Research: Track I: A Formal Approach to Preventing Human Error in Cyber-human Systems with Human Reliability Rating and Model Repair
   Sponsor: NSF
   PI   **Matthew L. Bolton**
   Amount: $8,000
   Date: 8/2021 – 8/2023

Pending Grants

GN1   Collaborative Research: FMitF: Track I: Designing Safe and Robust Human-machine Interactions with Fuzzy Mental Models
   Sponsor: NSF
   PI   **Matthew L. Bolton**
   Amount: $375,00
   Date: 9/2023 – 9/2027

GN2   HCC: Small: A Systematic Investigation of Sexual Bias in Voice Over Internet Protocol Codecs
   Sponsor: NSF
   PI   **Matthew L. Bolton**
   Amount: $600,000
   Date: 7/2023 – 7/2026

Completed Grants, Cooperative Agreements, and Contracts

GP1   Assured Human-Autonomy
   Sponsor: Lockheed Martin
   PI: **Matthew L. Bolton**
   Amount: $70,000
   Date: 1/2022 – 1/2023

GP2   Supplement (Undergraduate Research): GC2 FMitF: Collaborative Research: Track I: A Formal Approach to Preventing Human Error in Cyber-human Systems with Human Reliability Rating and Model Repair
   Sponsor: NSF
   PI: **Matthew L. Bolton**

Award Amount: $8,000
Date: 8/26/2020-8/25/2021

GP3   The Measurement Scales of Psychometric Ratings: Are They on the Level?
       Sponsor: Air Force Research Laboratory (federal pass through via Universal Technology Corporation)
       PI: **Matthew L. Bolton**
       Award Amount: $320,000
       Date: 1/2018-12/2020

GP4   Buffalo Blue Sky Initiative
       CoPIs: Marina Blanton, **Matthew L. Bolton**, & Lukasz Ziarek
       Award Amount: $15,000

GP5   Ethics in CS Education as a first principle and not an afterthought
       Sponsor: The Mozilla Foundation
       PI: **Atri Rudra**
       CoPIs: … **Matthew L. Bolton** … (out of 9 CoPIs)
       Award Amount: $150,000
       Matthew's Portion: $14,100
       Date: 6/1/2019-5/31/2020

GP6   Building Ethical Artificial Intelligence
       Sponsor: The University at Buffalo, SUNY (Germination Space Program)
       CoPIs: **Matthew L. Bolton**, Varun Chandola, Kenny Joseph, Jonathan Manes, Atri Rudra, and Mark Shepard
       Award Amount: $25,000
       Date: 8/2018 – 12/2019

GP7   A Formal Approach to Detecting and Correcting Simultaneous Masking in the IEC 60601-1-8 International Medical Alarm Standard
       Sponsor: AHRQ
       PI: **Matthew L. Bolton**
       Award Amount: $711,671
       Date: 9/30/2016-9/29/2019

GP8   Young Investigator Program (8.5): Preventing Complex Failures of Human Interactive Systems with Erroneous Behavior Generation and Robust Human Task Behavior Patterns
       Sponsor: Army Research Office
       PI: **Matthew L. Bolton**
       Award Amount: $100,000
       Date: 8/2015-8/2017

GP9   Scenario development through computational and formal modeling for verification and validation of authority and autonomy constructs in aviation
       Sponsor: NASA Ames Research Center
       PI: Amy Pritchett (Georgia Institute of Technology)
       Institutional PI: **Matthew L. Bolton**
       Award Amount: $1,392,454
       Matthew's Amount: $192,500
       Date: 1/2014 – 12/2016
       Credit: 100%

GP10   EAGER: Automatically Generating Formal Human-computer Interface Designs from Task Analytic Models
       Sponsor: National Science Foundation
       PI: **Matthew L. Bolton**
       Award Amount: $149,997
       Date: 8/15/2013 – 8/14/2016
       Credit: 100%

GP11   Verification models for advanced human-automation interaction in safety critical flight operations.
       Sponsor: European Space Agency, subcontract from IXION Industry and Aerospace

	PI:	Francisco Barreiro (IXION Industry and Aerospace)
	Institutional PI:	**Matthew L. Bolton**
	Total Amount:	150,000 € (approximately $193,965)
	Matthew's Amount:	34,771 € (approximately $44,962)
	Date:	10/15/2012 – 10/14/2013
	Credit:	100%

GP12 NextGenAA: Integrated model checking and simulation of NextGen authority and autonomy.

	Sponsor:	NASA Ames Research Center, subcontract from the University of Virginia
	PI:	Ellen J. Bass (University of Virginia / Drexel University)
	Institutional PI:	**Matthew L. Bolton**
	Total Amount:	$2,533,574
	Matthew's Amount:	$147,656
	Date:	01/01/2011 – 10/31/2013
	Credit:	100%

GP13 Synthetic vision systems – NIA/NASA graduate research assistantship (**M. Bolton**)

	Sponsor:	NASA LaRC, subcontract from NIA UVA-03-01, Sub-Award 4817-VA
	Total Amount:	$84,028
	Date:	06/17/2004 – 09/30/2006
	Credit:	100%

Consulting Activities (not counted in grant totals)

Gcon1 Training Approach for Cue-Based Identification of Risky Behaviors (TAC-IRB)

	Sponsor:	Army Research Institute / Charles River Analytics / CUBRC
	Consulting Amount:	$18,000
	Date:	8/2020 – 8/2021

VIII. Teaching and Advising

Summary Statistics

Courses Taught:	30	Average Evaluation (out of 5):	4.66
Graduated PhD Students:	7	Graduated Terminal MS Students:	4

Courses Taught

School	Courses	Semester	Grads	Undergrads	Total	Evaluation[1]
UVA	SYS 6007 - Human Factors I	Spring 23	56	0	63	Pending
UVA	SYS 4581/6581 - Human Factors in Safety	Fall 22	27	2	29	4.42/5
UVA	SYS 6007 - Human Factors I	Spring 22	63	0	63	3.77/5
UB	IE 441/541 - Human Factors in Safety	Fall 21	56	15	71	4.7/5
UB	IE 441/541 - Human Factors in Safety	Summer 21	39	9	48	4.66/5
UB	IE 441/541 - Human Factors in Safety	Spring 21	38	32	70	4.51/5
UB	IE 441/541 - Human Factors in Safety	Summer 20	19	2	21	4.4/5
UB	IE 441/541 - Human Factors in Safety	Spring 20	53	38	91	4.25/5[‡]
UB	IE 500 - Programming for Human Factors	Fall 19	8	0	8	4.6/5
UB	IE 441/541 - Human Factors in Safety	Summer 19	5	10	15	NA
UB	IE 441/541 - Human Factors in Safety	Spring 19	27	41	68	4.44/5
UB	IE 640 - Formal Methods for Human Factors	Spring 19	7	0	7	4.8/5
UB	IE 500 - Programming for Human Factors	Fall 18	14	0	14	5/5
UB	IE 441/541 - Human Factors in Safety	Summer 18	6	5	11	5/5
UB	IE 500 - Programming for Human Factors	Spring 18	11	0	11	5/5

UB	IE 441/541 - Human Factors in Safety	Spring 18	21	27	48	4.97/5
UB	IE 640 - Formal Methods for Human Factors	Fall 17	5	0	5	5/5
UB	IE 441/541 - Human Factors in Safety	Summer 17	2	0	2	NA
UB	IE 441/541 - Human Factors in Safety	Spring 17	57	30	87	4.84/5
UB	IE 640 - Formal Methods for Human Factors	Fall 16	16	0	16	5/5
UB	IE 441/541 - Human Factors in Safety	Summer 16	2	4	6	NA
UB	IE 441/541 - Human Factors in Safety	Spring 16	68	23	91	4.69/5
UB	IE 531 - Human Factor Research Methods	Fall 15	15	0	15	4.70/5
UB	IE 441/541 - Human Factors in Safety	Summer 15	2	3	5	NA
UB	IE 441/541 - Human Factors in Safety	Spring 15	41	24	65	4.57/5
UB	IE 632 B - Formal Methods for Human Factors	Fall 14	9	0	9	4/4
UB	IE 441/541 - Human Factors in Safety	Spring 14	50	29	79	3.84/5
UIC	IE 441/541 - Ergonomics and Human Factors	Fall 13	13	26	39	4.79/5
UIC	IE 584 - Human Performance Modeling	Spring 13	17	0	17	4.93/5
UIC	IE 441/541 - Ergonomics and Human Factors	Fall 12	10	17	27	4.63/5

[†] Based on average overall rating of the instructor

[‡] Based on overall rating of the course (instructor rating not collected due to special circumstances caused by the COVID 19 pandemic)

Independent Studies Supervised

Courses	Semester	Grads	Undergrads	Total
SYS 6993 – Independent study	Fall 22	1	0	1
SYS 6995 – Supervised Project	Fall 22	1	0	1
IE 494 / 496 – Internship / Capstone	Fall 21	0	3	3
IE 498 – Undergraduate Research	Spring 21	0	1	1
IE 502 – Individual Problems	Spring 20	1	0	1
IE 501 – Individual Problems	Fall 19	1	0	1
IE 602 – Individual Problems	Summer 19	1	0	1
IE 502 – Individual Problems	Spring 19	1	0	1
IE 501 – Individual Problems	Fall 18	3	0	3
IE 502 – Individual Problems	Spring 18	1	0	1
IE 499 – Independent Study	Spring 18	0	1	1
IE 501 – Individual Problems	Fall 17	4	0	4
IE 498 – Undergraduate Research	Fall 17	0	1	1
IE 502 – Individual Problems	Spring 17	1	1	2
IE 501 and IE 601 – Individual Problems	Fall 16	1	0	1
IE 501 and IE 601 – Individual Problems	Fall 15	3	0	3
IE 502 – Individual Problems	Spring 15	3	0	3

Research Supervision

Advising Highlights

1. Giovanna Camacho (advisee) received the competitive Laurel Clark Sea to Space Physiology Research Grant from the Women Divers Hall of Fame, 2023.

2. Xiaomei Wang (advisee) is now an assistant professor of industrial engineering at the University of Louisville.

3. Xiaomei Wang (advisee) won the Best Student Paper in Ergonomics in Design Article Award (which was based on her dissertation work) in 2020.

4. Elliot Biltekoff (PhD advisee) won the Most Innovate Presentation at the 2021 Human Factors Engineering Inter-University Workshop.

5. Xi Zheng (PhD advisee) won the 2020 UB Industrial and Systems Engineering Graduate Research of the Year Award.

6. Dr. Xi Zheng (PhD advisee) successfully defended her dissertation on April 20th and graduated in June 2020.

7. Dr. Jiajun Wei (PhD advisee) successfully defended his dissertation on August 1st and graduated in September 2019.

8. Xiaomei Wang (co-advised with Dr. Bisantz), defended her PhD on January 9th and graduated in February 2020.

9. Dr. Kylie Molinaro (PhD advisee) successfully defended her dissertation on December 6th and graduated in February 2019. She was previously a Senior Researcher at the Johns Hopkins Applied Physics Laboratory. She is currently a Senior Security Operations Planner at Resolvn

10. Dr. Meng Li (PhD advisee) won Best Student Paper in Human Performance Modeling at the 2018 HFES Annual Meeting.

11. Dr. Adam Houser (PhD advisee) successfully defended his dissertation on May 25th, 2018 and graduated in September 2018. He is currently a Senior Researcher at the Johns Hopkins Applied Physics Laboratory.

12. Dr. Meng Li (PhD advisee) successfully defended his dissertation on May 3rd, 2018 and graduated in September 2018. He is currently working as a Senior Human Factors Design Engineer at Medtronic.

13. Kylie Moliaro (advisee) won Best Poster at the 2017 Human Factors Engineering Inter-University Workshop.

14. Xi Zheng (advisee) won 2nd Best Student Paper in Human Performance Modeling at the 2017 HFES Annual Meeting.

15. Former visiting student Dan Pan preciously worked as a Postdoctoral Researcher and Lecturer at Tsinghua University. She is currently a tenured professor at the University of Science and Technology Beijing.

16. Ph.D. student Xi Zheng received 2nd place in the 2017 ISE Student Poster Competition[◊]

17. Ph.D. student Adam Houser received 2nd place in the 2016 ISE Student Poster Competition[⬩]

18. Ph.D. student Kylie Molinaro received an honorable mention for her NSF Graduate Fellowship application, 2016.

19. Ph.D. student Meng Li won best poster at the 15th Annual Human Factors Engineering Inter-University Workshop, Buffalo NY, 2014.

20. Bassam Hasanain (advisee) was previously as an Assistant Professor at the University of Business & Technology, Jeddah, Saudi Arabia. He is currently an Assistant Professor at King Abdul Aziz University

Advising Ph.D. Students

1. Giovanna Camacho, August 2022 – Present

2. Yeonbin Son, August 2022 – Present

3. Olivia Clair Rose, August 2022 – Present

4. Sky Solace Taylor, August 2022 – Present

5. Elliot Biltekoff, January 2019 – Present.

Advising Terminal MS Students

1. Kevin Byrne, January 2022 – Present

Advised Ph.D. students

1. Xi Zheng, **Defense Passed April 20th; Conferred on June 1st 2020.**

    Thesis: The Development of A Next-Generation Human Reliability Analysis: Systems Analysis for Formal Pharmaceutical Human Reliability (SAFPHR)

2. Xiaomei Wang (co-advised with Dr. Bisantz), **Defense Passed January 9th, 2020; Conferred on February 2020.**

Thesis: Towards Better Interpretability of Machine Learning-based Decision Support Systems

3. Jiajun Wei, **Defense Passed August 1st, 2019; Conferred September 2019.**

	Thesis: The Level of Measurement of Human-Automation Trust:Is It on the Level?

4. Kylie Molinaro, **Defense Passed December 6th, 2018; Conferred February, 2018**.

	Thesis: Understanding the Phish: Using Judgment Analysis to Evaluate the Human Judgment of Phishing Emails

5. Meng Li, **Defense Passed May 3rd, 2018; Conferred Sept. 1st, 2018**.

	Thesis: Formal Methods for User Experience Evaluation and Testing

6. Adam Houser, **Defense Passed May 25th, 2018; Conferred Sept. 1st, 2018**.

	Thesis: Mental Models for Cybersecurity: A Formal Methods Approach

7. Bassam Hasanain, **Graduated with a Ph.D. May, 2016.**

	Thesis: A Formal Approach for Detecting Masking in Medical Alarms

Advised Terminal M.S. Students

1. Pengyuan Wan - Defense Passed May 19th; Conferred June 1st, 2021.

	Thesis: A Taxonomy of Forcing Functions for Addressing Human Errors in Human Machine Interaction

2. Corey Hall - Defense Passed August 19th; Conferred August 31st, 2020.

	Thesis: Simultaneous Masking Between Audio Alarms in Terminal Air Traffic Control for Raytheon's Standard Terminal Automation Replacement System

3. Joseph Johnson - Defense Passed May 22nd; Conferred June 1st, 2020.

	Thesis title: The UX of voice assistants for people with disability

4. Sade Singleton - **Defense Passed July 29, 2018; Conferred Sept. 1st, 2018**.

	Thesis: An analysis of Simultaneous Masking between Reserved Alarm Sounds of the International Standard

Advised undergraduate students

1. Elliot Biltekoff, BS Student in Cognitive Science, Summer 2017 – December 2018. Currently a Ph.D. in my laboratory.

2. Emma Crooks, BS Student in Industrial Engineering, Fall 2020 – Spring 2021.

3. Rachael Steegmann, BS Student in Industrial Engineering, Fall 2020 – Spring 2021.

Sponsored visiting students

1. Thomas Darget, M.S. Student from ENSEEIHT, June 2019 – September 2019.

2. Imane Mellouli, M.S. Student from ENSEEIHT, June 2015 – September 2015.

3. Charly Rab, M.S. Student from ENSEEIHT, June 2015 – September 2015.

4. Dan Pan, Ph.D. Student from Tsinghua University, March 2014 – September 2014.

5. Victor Proto, M.S. Student from ENSEEIHT, June 2014 – August 2014.

Mentored undergraduate student capstone and research projects

1. Mentored two undergraduate student sponsored research projects for

2. Mentored two undergraduate students project for Evan Thielman and Maurice Ott, Spring 2016.

3. Mentored three undergraduate student projects (Charles Smith, Brett Nolan, and Aloysia Beaulieu) for improving work safety and efficiency at GM, Spring 2015.

4. Mentored a four-member undergraduate capstone team (Ran Huo, Sumeet Kumar, Giovanni Madejski, Jamie O'Neill, and Yongzhi Zhou) using six sigma techniques to improve the efficiency of the Buffalo City Hall print shop, Spring 2014.

5. Co-advised (as an graduate student) an undergraduate capstone team. Created software to extend the creation of synthetic vision systems tools, 2005 – 2006. Produced a publication.

Other Advised Graduate Research Projects

1. Svetlana Riabova, Fall 2019 – Spring 2020: Developed method for scoring the similarity of interface conditions for error modeling. Publications forthcoming.

2. Samaneh Ebrahimi, Fall 2013: Worked on method for generating interfaces from task models. Produced a conference paper and poster, see C22 and P15.

3. Jae Yoon, Summer and Fall 2013: Worked on a project to apply neural nets to the lens model. Produced the journal article J19.

4. Jackson Kwok, 2008, co-advised (as a graduate student). Extended educational software I created and evaluated it with an end user experiment.

Ph.D. Committees

1. Nicholas Gardella, (UVA) Systems Engineering, Spring 2023 – Present

2. Mohamad El Iskandarani, (UVA) Systems Engineering, Spring 2023 – Present

3. Jad Atweh, (UVA) Systems Engineering, Fall 2022 – Present

4. Madi Ebnali, (UB) Department of Industrial and Systems Engineering, Graduated in February 2020

5. Yaoyu Fu, (UB) Department of Industrial and Systems Engineering, Graduated in Spring 2022.

6. Judith Tiferes, (UB) Department of Industrial and Systems Engineering, Graduated in Spring 2017.

7. David Lavergne, (UB) Department of Industrial and Systems Engineering, Spring 2014–2018.

8. Sameh Alkam, (UIC) Department of Mechanical and Industrial Engineering, Fall 2012 – Spring 2014.

9. Yao Feng, (UIC) Department of Electrical and Computer Engineering, Spring 2013.

IX. Professional Membership and Activities

Professional Society Membership

− Human Factors and Ergonomics Society (HFES), 2004 – Present.

− IEEE Systems Man and Cybernetics, 2005 – Present.

Leadership Positions and Activities

− TG Chair of the Human Factors and Ergonomics Society's Council of Technical Groups, 2020 – 2023.

− TG Chair Elect of the Human Factors and Ergonomics Society's Council of Technical Groups, 2019 – 2020.

− Co-edited a special issue of IEEE Transitions on Human-Machine Systems on Computational Human Performance Modeling for Human-Machine Systems Design.

− Associate Editor, IEEE Transactions on Human-Machine Systems, 2016 – Present.

− TG Chair of the Human Factors and Ergonomics Society's Human Performance Modeling Technical Group, 2016 – 2018.

− TG Chair Elect of the Human Factors and Ergonomics Society's Human Performance Modeling Technical Group, 2014 – 2016.

− Program Chair of the Human Factors and Ergonomics Society's Human Performance Modeling Technical Group, 2012 – 2014.

- Co-chair of the Technical Committee on Human-Computer Interaction for IEEE Systems Man and Cybernetics, 2011 – 2015.
- Program Chair-Elect of the Human Factors and Ergonomics Society's Human Performance Modeling Technical Group, 2011 – 2012.
- Webmaster for the HFES Human Performance Modeling Technical Group, 2008 – 2014.
- President of the University of Virginia's Human Factors and Ergonomics Society student chapter, 2007 – 2009.
- Coeditor of the winter edition of *Cognitia,* the newsletter of the Human Factors and Ergonomics Society's Cognitive Engineering and Decision Making Technical Group, 2004.
- Organized events and prepared the application that got the University of Virginia's Human Factors and Ergonomics Society student chapter gold status recognition from the national society, 2008.
- Organized the participation of the University of Virginia's Human Factors and Ergonomics Society student chapter in the Virginia Tech human factors research symposium, 2008.
- Webmaster (http://www.sys.virginia.edu/hfes/) for the University of Virginia's Human Factors and Ergonomics Society's student chapter, 2003–2007.

Journal Paper Reviewer

- ACM Transactions on Computing for Healthcare (HEALTH).
- Cognitive, Affective, and Behavioral Neuroscience.
- Computational and Mathematical Organization Theory.
- Current Directions in Psychological Science.
- Ergonomics in Design.
- Human Factors.
- Human Computer Studies.
- IEEE Transaction on Human Machine Systems.
- IEEE Transaction on Systems, Man, and Cybernetics: Systems.
- IEEE Transaction on Systems, Man, and Cybernetics: Part A, Systems and Humans (broken up into the previous two entries).
- IEEE Transactions on Automation Science and Engineering.
- IEEE Transactions on Reliability.
- Industrial Ergonomics.
- Innovations in Systems and Software: A NASA Journal.
- Interacting with Computers.
- International Journal of Human-Computer Interaction.
- Journal of Aerospace Information Systems.
- Journal of Cognitive Engineering and Decision Making.
- Journal of Trust Management.
- Reliability Engineering and System Safety.
- Theoretical Issues in Ergonomics Science.
- Transactions on Software Engineering.
- Transactions on Management Information Systems.
- Transportation Research Part C.

Conference and Workshop Organization

− Associated Editor, 2022 IEEE International Conference on Human Machine Systems.

− Associate Editor, 2021 IEEE International Conference on Systems, Man, and Cybernetics.

− Organized an invited symposium at the 2017 HFES annual meeting on Novel Developments in Formal Methods for Human Factors Engineering.

− Organized the program for the Human Performance Modeling Technical Group for the 2013 and 2014 HFES Annual Meetings.

− Chaired session at the 2015 IIE Annual Conference and Expo, Nashville, TN.

− Initiated and acquired IEEE Technical Co-sponsorship of the AAAI 2014 Symposium on Modeling in Human-Machine Systems: Challenges for Formal Verification.

− Co-organized the Midwest Verification Day 2013 (MVD'13), University of Illinois at Chicago.

− Jointly organized the 2012 workshop "Formal Methods in Human Machine Interaction (Formal H)".

− Organized and chaired a special session on "Applications of Formal Methods to Human-automation Interaction" at the 2011 IEEE International Conference on Systems, Man, and Cybernetics.

− Chaired sessions at the 2008, 2009, 2010, 2011, 2013, 2014, 2015, 2017, and 2019 Human Factors and Ergonomics Society Annual Meetings.

− Helped prepare proceedings for the 2005 IEEE Systems and Information Engineering Design Symposium.

− Served as a judge for the 2004 student paper competition of the Human Factors and Ergonomics Society's Cognitive Engineering and Decision Making Technical Group.

Program Committee Member / Conference Paper Reviewer

− 7th International Workshop on Formal Methods for Interactive Systems, 2018.

− Software Challenges in Aerospace Symposium (SCiA) 2015

− International Conference on Model & Data Engineering (MEDI) 2014, 2016.

− Verified Software: Theories, Tools and Experiments 2013.

− Engineering Interactive Computing Systems 2013.

− Automation in Command and Control Systems (ATACCS) 2011, 2012.

− Behavior Representation in Modeling & Simulation 2011, 2012, 2013.

− Human Factors and Ergonomics Society Annual Meeting 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021.

− IEEE International Conference on Systems, Man, and Cybernetics 2006, 2007, 2008, 2009, 2011, 2012, 2013, 2014, 2016, 2021.

− INTERACT 2011.

− Tools and Algorithms for the Construction and Analysis of Systems (TACAS) 2011, 2012, 2013.

− The ACM SIGCHI Symposium on Engineering Interactive Computing Systems 2013, 2014, 2015, 2016.

− Formal Methods in Human Computer Interaction (FoMHCI) 2015, 2016.

Grant Proposal Reviewer

− Reviewed proposal for the European Research Council, 2020.

− Served as a panelist for the National Science Foundation, 2018, 2019.

− Reviewed proposal for The Netherlands Organisation for Scientific Research, 2018.

− Reviewed proposals for the Army Research Lab Basic Research, 2017.

− Reviewed proposal for the Israel Science Foundation, 2014 and 2021.

Tenure Case Reviewer

− Reviewed tenure case for UC Davis.

Professional Development Workshops Attended

− UB Germination Space: A series of three workshops for developing transformative research questions, March, April, and May 2018.
− Artificial Intelligence: Institute for Human-Machine Partnerships workshop, August 2017.
− SEAS Faculty Workshop: Cultural Competence for Faculty in the Academy, November 2015.
− "NIH Grants Seminar: Insights and Strategies for Early and Mid-Career Scholars" at the University at Buffalo, State University of New York, August 24, 2015.
− "Transitioning to Autonomy: Changes in the Role of Humans in Air Transportation" at NASA Ames Research Center, Moffett Field, CA, March 10-12, 2015.
− "NSF Grants Conference" in Arlington, VA, October 6 – 7, 2014.
− "Home Health Innovations: Bridging Research and Practice" at the University at Buffalo, State University of New York, May 15, 2014.
− "Write Winning NSF Grant Proposals" at the University of Illinois at Chicago, October 17, 2012.
− "Cognitive Crash Dummies: Predictive Human Performance Modeling for Interactive System Design" at the 53rd Annual Meeting of Human Factors and Ergonomics Society, October 29, 2009.

X. Departmental, School, and University Service

University of Virginia

School

− Organized a professional development session for the link lab where students shared tools they use in the their research, Fall 2022.
− Presented an invited talk to the HFES student chapter on measurement theory and subjective measures, Fall 2022.
− Provided academic advising for seven undergraduate students.
− Participated in multiple outreach activities for the 100 black men of Central Virginia, Summer 2022, Fall 2022.

Department

− Organized the department's graduate research symposium (poster session), Spring 2023.
− Served on the graduate committee co-chair: Assisted in graduate program advertising, student recruitment, application review, and fellowship selection, 2022-2023 Academic Year.
− Prepared the department's tenure renew letter for an assistant professor candidate, Fall 2022.
− Organized the department's visit with Willowtree, Spring 2022.

University at Buffalo, State University of New York

University

− Served as a chapter and state delegate in the United University Professions union, Spring 2021 – Fall 2021.
− Served as member of the Buffalo Center United University Professions union membership committee, Summer 2020 – Present.
− Volunteer for educational video production outreach to the Bennett High School in Buffalo, New York, 2016.

School

− Served on the School of Engineering and Applied Sciences Tenure Committee, Fall 2019 – Spring 2020
− Served as a judge for the 11th Annual CSTEP Research Poster Symposium & Luncheon

- − Served as a committee member on an academic integrity hearing, spring 2017.
- − Served as a marshal at the 2016 and 2018 Graduation Ceremony.
- − Served as the Club Advisor for the UB student chapter of the HFES, August 2015 - Present.
- − Served as a judge for the 2015 and 2016 SEAS Graduate Poster Competition.
- − Served on the SEAS Undergraduate Grievance Committee, January 2015 – Present

Department
- − Served as the director of Undergraduate Studies, Spring 2021 – 2022.
- − Presented a lecture for the IIE Research Series on March 23, 2021.
- − Participated on a panel on academic writing for departmental graduate students on scientific writing.
- − Served as the department representative for the United University Professions union, Fall 2020 – Present.
- − Served on departmental strategic planning committees.
- − Served on the faculty search committee, Spring 2018.
- − Served as the co-chair of the ISE Praxair Seminar Series, 2016/2017.
- − Served as the faculty representative of the UB HFES student chapter, 2015– 2021.
- − Served on the Graduate Committee for the Department of Industrial and Systems Engineering 2015 – 2020.
- − Assisted in the selection and ranking of Ph.D. student applicants to the department's human factors program in the 2014/2015 academic year.
- − Presented a lecture for IE 101, a class designed to get students excited about industrial and systems engineering in Spring 2014 - 2021.
- − Co-organized the 2014, 2015, 2016, 2017, 2018, 2019, and 2020 Department of Industrial and System Engineering student poster competition.
- − Updated and presented a poster promoting UB's Human Factors program at the 2014, 2015, 2016, 2018, and 2019 International Annual Meeting of the Human Factors and Ergonomics Society.
- − Led the effort to renew the accreditation of our human factors education program for the HFES in 2015 and 2019.
- − Presented a lecture for the IIE Research Series on October 24, 2014 .

University of Illinois at Chicago

University
- − Served on the Goldwater Scholarship selection committee for the University of Illinois at Chicago in 2012 and 2013.

School
- − Conducted a video interview for ENGAGE (engaging students in engineering) in 2012: https://www.youtube.com/watch?v=kOZVYmKV7Y0

Department
- − Served on the Graduate Committee for the University of Illinois at Chicago's Department of Mechanical and Industrial Engineering 2012 – 2013.
- − Served as the faculty meeting secretary for the University of Illinois at Chicago's Department of Mechanical and Industrial Engineering 2012 – 2013.

University of Virginia (as student)

School

- Presented at the 2004 and 2005 engineering open houses.

- Presented at the 2004 Science, Engineering, Communication, Mathematics Enhancement Program open house.

- Presented at the 2006, 2007, and 2008 Prospective Student Day.

Department

- Designed the website for the UVA MINDSET program (http://www.sys.virginia.edu/healthcare/) in 2010.

- Represented the University of Virginia's Department of Systems and Information Engineering at the 2006 and 2008 HFES annual meeting's lab presentations.

- Represented the University of Virginia's Department of Systems and Information Engineering at the "Integration of Advanced Concepts and Vehicles into the Next Generation Air Transportation System" Pre-proposal Conference, August 9, 2007.

- Organized a weekly human factors research seminar series for the 2006 summer and fall terms.