

Michael A. Madaio

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Postdoctoral Researcher 2020-2022
FATE Research Group, Microsoft Research, New York City

EDUCATION

Ph.D. in Human-Computer Interaction 2020
Carnegie Mellon University

M.S. in Digital Media 2015
Georgia Institute of Technology

M.Ed. in Curriculum and Instruction 2010
University of Maryland, College Park

B.A. in English Language and Literature 2009
University of Maryland, College Park

HONORS AND AWARDS

Best Student Paper Award, Intl. Conference on AI in Education (AIED) 2020

Best Paper Award, ACM CHI Conference 2020

Siebel Scholarship, Siebel Scholars Foundation 2019

Best Paper Award, ACM COMPASS Conference 2019

Best Paper Award, Conference of the Learning Sciences (ICLS) 2018

Best Student Paper Nominee, Conference of the Learning Sciences (ICLS) 2018

Best Student Paper Award, CSCL Conference 2017

Ford Foundation Pre-Doctoral Fellowship, Honorable Mention 2016-2017

Best Student Paper Runner-up, ACM KDD Conference 2016

Fellowship, Institute for Education Sciences, U.S. Dept. of Education 2016

Best Thesis Award, Ivan Allen College, Georgia Tech 2015

Excellence in Teaching Award, Montgomery County Public Schools 2011-2012

PUBLICATIONS

REFEREED CONFERENCE PUBLICATIONS (PEER-REVIEWED)

[C14] **Madaio, M.**, Egede, L., Subramonyam, H., Wortman Vaughan, J., & Wallach, H. (2022). Assessing the Fairness of AI Systems: AI Practitioners' Processes, Challenges, and Needs for Support. *Proc. ACM Hum.-Comput. Interact.* 6, CSCW1, Article 52 (April 2022), 26 pages.

[C13] Chatterjee, R., **Madaio, M.**, & Ogan, A. (2020). Predicting Gaps in Usage in a Phone-Based Literacy Intervention System. In *International Conference on Artificial Intelligence in Education*. [**Best Student Paper Award**]

[C12] **Madaio, M. A.**, Stark, L., Wortman Vaughan, J., & Wallach, H. (2020). Co-designing checklists to understand organizational challenges and opportunities

around fairness in AI. In *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems*. **[Best Paper Award]**

- [C11] **Madaio, M.**, Yarzebinski, E., Kamath, V., Zinszer, B.D., Hannon-Cropp, J., Tanoh, F., Akpe, Y.H., Seri, A.B., Jasińska, K.K. & Ogan, A., (2020). Collective support and independent learning with a voice-based literacy technology in rural communities. In *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems*.
- [C10] **Madaio, M.**, Kamath, V., Yarzebinski, E., Zasacky, S., Tanoh, F., Hannon-Cropp, J., Cassell, J., Jasinska, K. & Ogan, A., (2019). "You give a little of yourself:" family support for children's use of an IVR literacy system. In *Proceedings of the 2nd ACM SIGCAS Conference on Computing and Sustainable Societies*. **[Best Paper Award]**
- [C9] **Madaio, M.**, Tanoh, F., Seri, A. B., Jasinska, K., & Ogan, A. (2019). "Everyone Brings Their Grain of Salt:" Designing for Low-Literate Parental Engagement with a Mobile Literacy Technology in Côte d'Ivoire. In *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems*.
- [C8] Singh Walia, B., Hu, Q., Chen, J., Chen, F., Lee, J., Kuo, N., Narang, P., Batts, J., Arnold, G. & **Madaio, M.**, (2018). A dynamic pipeline for spatio-temporal fire risk prediction. In *Proceedings of the 24th ACM SIGKDD International Conference on Knowledge Discovery & Data Mining*. **[12% acceptance rate]**
- [C7] Uchidiuno, J., Yarzebinski, E., **Madaio, M.**, Maheshwari, N., Koedinger, K., & Ogan, A. (2018). Designing appropriate learning technologies for school vs home settings in Tanzanian rural villages. In *Proceedings of the 1st ACM SIGCAS Conference on Computing and Sustainable Societies*.
- [C6] Zhao, Z., **Madaio, M.**, Pecune, F., Matsuyama, Y., & Cassell, J. (2018). Socially-conditioned task reasoning for a virtual tutoring agent. In *Proceedings of the 17th International Conference of Autonomous Agents and Multi-Agent Systems*.
- [C5] **Madaio, M.**, Peng, K., Ogan, A., & Cassell, J. (2018). A climate of support: a process-oriented analysis of the impact of rapport on peer tutoring. In *Proceedings of the 12th International Conference of the Learning Sciences (ICLS)*. **[Best Paper Award] [Best Student Paper Nominee]**
- [C4] Yu, H., Gui, L., **Madaio, M.**, Ogan, A., Cassell, J., & Morency, L. P. (2017). Temporally selective attention model for social and affective state recognition in multimedia content. In *Proceedings of the 25th ACM SIGMM Multimedia Conference*.
- [C3] **Madaio, M.**, Lasko, R., Ogan, A., & Cassell, J. (2017). Using Temporal Association Rule Mining to Predict Dyadic Rapport in Peer Tutoring. In *Proceedings of the 10th International Conference on Educational Data Mining*.

- [C2] **Madaio, M.**, Cassell, J., & Ogan, A. (2017). The impact of peer tutors' use of indirect feedback and instructions. In *Proceedings of the 12th International Conference on Computer-Supported Collaborative Learning (CSCL)*, June, 2017. **[Best Student Paper Award]**
- [C1] **Madaio, M.**, Chen, S.T., Haimson, O.L., Zhang, W., Cheng, X., Hinds-Aldrich, M., Chau, D.H. & Dilkina, B. (2016). Firebird: Predicting fire risk and prioritizing fire inspections in Atlanta. In *Proceedings of the 22nd SIGKDD International Conference on Knowledge Discovery and Data Mining*. **[Best Student Paper - Runner-Up] [12% acceptance rate]**

JOURNAL PUBLICATIONS (PEER-REVIEWED)

- [J3] Kizilcec, R. F., Chen, M., Jasińska, K. K., **Madaio, M.**, & Ogan, A. (2021). Mobile Learning During School Disruptions in Sub-Saharan Africa. *AERA Open*, 7.
- [J2] Baker, R. S., Walker, E., Ogan, A., & **Madaio, M.** (2020). Culture in computer-based learning systems: challenges and opportunities. In *Computer-Based Learning in Context*, 1(1), 1-13. 2019.
- [J1] **Madaio, M.**, Cassell, J., & Ogan, A. (2017). “I think you just got mixed up”: confident peer tutors hedge to support partners' face needs. *International Journal of Computer-Supported Collaborative Learning*, 12(4), 401-421.

WORKSHOPS AND TUTORIALS ORGANIZED (LIGHTLY PEER REVIEWED)

- [WS3] Gandhi, T., Nandi, M., Dudik, M., Wallach, H., **Madaio, M.**, Weerts, H., Jalali, A., Ibanez, I. (2021). Fairness in AI Systems: From Social Context to Practice using Fairlearn. Tutorial presented at the *2021 SciPy Virtual Conference*.
- [WS2] Blodgett, S.L., **Madaio, M.**, O'Connor, B., Wallach, H. and Yang, Q., (2021). Proceedings of the First Workshop on Bridging Human–Computer Interaction and Natural Language Processing. Hosted at the *2021 European Association for Computational Linguistics (EACL)*.
- [WS1] Cassell, J., Scassellati, B., **Madaio, M.**, & Brawer, J. (2018). Bridging the Gap: An NSF Workshop on Conversational Agents and Human-Robot Interaction. *NSF Cyber-Human Systems (CHS), Robust Intelligence, National Robotics Initiative*.

BOOK CHAPTERS (LIGHTLY PEER REVIEWED)

- [BC2] **Madaio, M.**, Blodgett, S. L., Mayfield, E., & Dixon-Román, E. (in press). Beyond “Fairness”: Structural Injustice Lenses On AI for Education. Invited chapter in *The Ethics of Artificial Intelligence in Education: Current Challenges, Practices and Debates*, W. Holmes and K. Porayska-Pomsta (Eds.), Routledge.
- [BC1] **Madaio, M.**, & Martin, S.E. (2020). Who Owns the Smart City? Towards an Ethical Framework for Civic AI. Invited chapter in *Ethics in design and communication: Critical perspectives*. Scherling, L., & DeRosa, A. (Eds.), Bloomsbury Publishing.

WORKSHOP PAPERS AND SHORT PAPERS (LIGHTLY PEER-REVIEWED)

- [W14] Delgado, F., Yang, S., **Madaio, M.**, Yang, Q. (2021). Stakeholder Participation in AI: Beyond “Add Diverse Stake-holders and Stir”. Accepted to the *Human-Centered AI Workshop at NeurIPS 2021*.
- [W13] **Madaio, M.**, Egede, L., Subramonyam, H., Wortman Vaughan, J, and Wallach, H. (2021). Assessing Fairness in Practice: AI Teams’ Processes, Challenges, and Needs for Support. Accepted to the *Human-Centered AI Workshop at NeurIPS 2021*.
- [W12] **Madaio, M.**, Stark, L., Wortman Vaughan, J., Wallach, H. (2020). Prompting Conversations about Fairness in AI Design with Checklists. Presented at the *Workshop on Ethics in Design at the 2020 CSCW Conference*.
- [W11] **Madaio, M.**, Stark, L., Wortman Vaughan, J., Wallach, H. (2020). Need for Organizational Performance Metrics to Support Fairness in AI. Presented at the *Workshop on Fair and Responsible AI at the 2020 CHI Conference*.
- [W10] Black, E., Williams, J., **Madaio, M.**, & Donti, P. (2020). A Call for Universities to Develop Requirements for Community Engagement in AI Research. Presented at the *Workshop on Fair and Responsible AI at the 2020 CHI Conference*.
- [W9] Mayfield, E., **Madaio, M.**, Prabhumoye, S., Gerritsen, D., McLaughlin, B., Dixon-Román, E., & Black, A. W. (2019). Equity beyond bias in language technologies for education. In *Proceedings of the Fourteenth Workshop on Innovative Use of NLP for Building Educational Applications* (pp. 444-460).
- [W8] Cannanure, V.K., **Madaio, M.**, Ogan, A., & Brown, T. (2019). Using Graphical Models to Understand Usage of an Educational Interactive Voice Response System. Presented at the *2019 ACM SIGCAS Conference on Computing and Sustainable Societies*.
- [W7] **Madaio, M.**, & Ogan, A. (2019). Design Opportunities for AI in Education to Support Parents Learning Literacy. Presented at the *Supporting Lifelong Learning Workshop at Artificial Intelligence in Education (AIED)*.
- [W6] Lee, J., Lin, Y., & **Madaio, M.** (2018). A Longitudinal Evaluation of a Deployed Fire Risk Model. Poster presented at the *AI for Social Good Workshop at the 32nd Neural Information Processing Systems Conference (NeurIPS)*.
- [W5] **Madaio, M.**, & Ogan, A. (2018). Supporting Parent-Child Literacy Interactions with Feature Phones in Côte d’Ivoire. In the *HCI Across Borders Symposium at the 2018 ACM SIGCHI Conference on Human Factors in Computing Systems*.
- [W4] **Madaio, M.**, Ogan, A., & Cassell, J. (2016). The Effect of Friendship and Tutoring Roles on Reciprocal Peer Tutoring Strategies. Presented at the *International Conference on Intelligent Tutoring Systems (ITS)* (pp. 423-429).

- [W3] **Madaio, M.**, Chen, S.T., Haimson, O.L., Zhang, W., Cheng, X., Hinds-Aldrich, M., Chau, D.H. & Dilkina, B. (2015). Identifying and Prioritizing Fire Inspections: A Case Study of Predicting Fire Risk in Atlanta. Presented at the *Bloomberg Data for Good Exchange*.
- [W2] **Madaio, M. A.**, Grinter, R. E., & Zegura, E. W. (2016). Experiences with MOOCs in a West-African technology hub. In *Proceedings of the Eighth International Conference on Information and Communication Technologies and Development*.
- [W1] Zegura, E. W., **Madaio, M. A.**, & Grinter, R. E. (2015). Beyond bootstrapping: the liberian ilab as a maturing community of practice. In *Proceedings of the Seventh International Conference on Information and Communication Technologies and Development* (pp. 1-4).

REGULATORY FILINGS

Baker, P.M.A., **Madaio, M.** (2014). Comments filed in response to the Office of Science and Technology Policy's Notice of Request for Information (RFI) requesting public comments to inform its policy development related to high-impact learning technologies. *Federal Register*, Vol. 79 (8).

GRANTS

- [G3] **Putting Data to Work: Supporting Workforce Development.** Awarded
Metro21 Smart Cities Institute **\$42,968**
 with Kenneth Holstein (co-PI) 2018-2020
- [G2] **Bridging the Gap: An NSF Workshop on Conversational Agents and Human-Robot Interaction** Awarded
NSF Cyber-Human Systems, Robust Intelligence, National Robotics Initiative. **\$49,869**
 with Justine Cassell, Brian Scassellatti, and Jake Brawer 2018
- [G1] **Using Spatio-Temporal Machine Learning to Inform Fire Risk Reduction** Awarded
Metro21 Smart Cities Institute **\$17,600**
 2017

FELLOWSHIPS AND TRAVEL AWARDS

- [F6] **Siebel Scholar Fellowship** **\$35,000**
 Siebel Scholars Foundation 2019-2020
- [F5] **Educational Data Mining Conference Travel Award** **\$1,500**
 International Education Data Mining Society 2017
- [F4] **Investigating the Role of Rapport in Learning** **\$9,000**
 Collaborative Research Experience for Undergraduates (CREU) 2017

- [F3] **ACM SIGKDD Conference Student Travel Award** **\$750**
Association for Computing Machinery 2016
- [F2] **Fellowship in Interdisciplinary Education Research** **\$127,500**
Institute for Education Sciences, Department of Education 2015-2018
- [F1] **Technology Design Workshop Student Travel Award** **\$1,200**
National University of Singapore, CUTE Center 2015

INVITED TALKS

- [T7] **Invited Speaker** February, 2022
Center for Information Technology Policy, Princeton University
Towards human-centered design of fair and responsible AI.
- [T7] **Invited Speaker** January, 2022
Nokia Bell Labs
Human-centered approaches to supporting AI fairness in practice.
- [T6] **Invited Speaker** July, 2021
HCI International Conference
Human-centered approaches to supporting AI fairness in practice.
- [T5] **Invited Speaker** July, 2020
Third Space Group, University of Toronto
Collective support and independent learning with a voice-based literacy technology in rural communities.
- [T4] **Invited Speaker** April, 2020
GroupLens Group, University of Minnesota
Co-designing checklists to understand organizational challenges and opportunities around fairness in AI.
- [T3] **IAALDE Best Paper Encore Talk** July, 2019
AI in Education Conference
A climate of support: A temporal analysis of the role of rapport in learning.
- [T2] **Keynote Speaker** October, 2018
Forward with Google for Education
Using machine learning to understand social dimensions of learning.
- [T1] **Invited Panelist** July, 2018
Google Cloud NEXT
Using machine learning to understand social dimensions of learning.

SELECTED PRESS

- [M5] How to build a civic tech community, according to Pittsburgh leaders.
Kim Lyons, *Technical.ly*, October, 2018.
- [M4] Data Tool Created By CMU Student Helps Predict Fire-Prone Buildings
In Pittsburgh. Amy Wadas, *CBS Pittsburgh*, April, 2018.
- [M3] Where's the fire? This data approach is helping Pittsburgh pinpoint buildings at risk. Adam Smeltz, *Pittsburgh Post-Gazette*, April, 2018.
- [M2] Embracing Analytics: How Communities Around the Country are Utilizing Data Analytics to Predict a Host of Risk Factors and Reduce Fires.
Jesse Roman, *National Fire Protection Association Journal*, May 2016.
- [M1] When Computing Equals Social Good.
Georgia Tech College of Computing, July 2015.

STUDENT ADVISING AND MENTORING (*denotes co-author)

UNDERGRADUATE SENIOR THESES ADVISED

Rishabh Chatterjee, B.S. Computer Science, Carnegie Mellon University*
Lauren Trichtinger, B.S. Psychology, Chatham University

UNDERGRADUATE INDEPENDENT STUDY OR REU STUDENTS ADVISED

Michelina Astle, B.S. Psychology, Chatham University
Jake Beley, B.S. Computer Science, Dickinson College
Naomi Eigbe, B.S. Psychology and Computer Science, Rice University
Lisa Egede, B.S. Computer Science, University of Oklahoma*
Alvaro Granados, B.S. Neuroscience, University of Pittsburgh
Robert Huerbin, B.S. Psychology, University of Pittsburgh
Rae Lasko, B.S. Cognitive Science, Carnegie Mellon University*
Jessica Lee, B.S. Computer Science, Carnegie Mellon University*
William Liu, B.S. Cognitive Science, Carnegie Mellon University
Kun Peng, B.S. Statistics and Machine Learning*
Shelby Zasacky, B.S. Mathematical Sciences and Art*
Zian Zhao, B.S. Information Engineering, Shanghai Jiao Tong University*

MASTERS RESEARCH ASSISTANTS SUPERVISED

Mohammed Alburaiki, Masters in Educational Technology and Learning Science
Connie Chau, Masters in Human-Computer Interaction*
Carolina Arroyo Hernandez, Masters in Public Policy and Management, Data Analytics
Qianyi Hu, Masters in Information Systems Management, Carnegie Mellon University*
Sara Jackson, Masters in Public Policy and Management, Data Analytics
Yanwen Lin, Masters in Civil and Environmental Engineering, Carnegie Mellon University*
Bhavkaran Singh, Masters in Information Systems Management, Carnegie Mellon University*
Xiaoyi Tian, Masters in Information Science, University of Pittsburgh

TEACHING EXPERIENCE

GUEST LECTURES

Machine Learning-Operated Systems, Northwestern University Fall 2020
Psychology Research Design and Analysis, Swarthmore College Fall 2020

TEACHING ASSISTANTSHIPS

Designing Human-Centered Systems, Carnegie Mellon University 2020
User-Centered Research and Evaluation, Carnegie Mellon University 2017
Introduction to Computational Media, Georgia Institute of Technology 2013

INSTRUCTOR

English Language and Literature, John F. Kennedy High School, MD 2009-2013

SERVICE

ASSOCIATE CHAIR

ACM Conference on Computer-Supported Collaborative Work (CSCW) 2021-2022
ACM Conference on Human Factors in Computing Systems (CHI) 2021-2022
ACM SIGCHI Late-Breaking Work 2020

PROGRAM COMMITTEE (PC) MEMBER

ACM Conference on Fairness, Accountability, and Transparency (FAccT) 2021-2022
International Conference on Artificial Intelligence in Education (AIED) 2020
Human-Centered Explainable AI Workshop at CHI 2021 2021
Workshop on AI in Education at AAAI 2021 2021

REVIEWING

ACM Conference on Human Factors in Computing Systems (CHI) 2016-2022
ACM Conference on Computer-Supported Collaborative Work (CSCW) 2020
ACM Conference on Interaction Design and Children (IDC) 2020
ACM Conference on Designing Interactive Systems (DIS) 2020
International Conference on Artificial Intelligence in Education 2017-2020
International Journal of AI in Education 2018-2020
ACM Transactions of Computer-Human Interaction (ToCHI) 2020-2021
Journal of Educational Data Mining 2018

RESEARCH EXPERIENCE

Microsoft Research, New York, NY 2019
Fairness, Accountability, Transparency, and Ethics Research Group
Research Intern (with Hanna Wallach and Jenn Wortman Vaughan)

United Nations University, Macau SAR, China 2018
Institute on Computing and Society
Visiting Research Assistant (with Araba Sey)

Data Science for Social Good, Atlanta 2015
Georgia Institute of Technology, Atlanta, Georgia
Graduate Research Assistant (with Polo Chau and Bistra Dilkina)