Michael A. Madaio

Human-Computer Interaction Institute
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EDUCATION

2015 - Present	**Ph.D.**, Human-Computer Interaction Carnegie Mellon University Advisors: Dr. Justine Cassell, Dr. Amy Ogan
2013 - 2015	**Master of Science**, Digital Media Georgia Institute of Technology Advisor: Dr. Ian Bogost
2009 - 2010	**Master of Education**, Curriculum and Instruction University of Maryland, College Park
2005 - 2009	**Bachelor of Arts**, English Language and Literature University of Maryland, College Park

RESEARCH EXPERIENCE

Summer 2018	**United Nations University, Macau SAR, China** Institute on Computing and Society Visiting Research Assistant (with Araba Sey)
August 2015 - Present	**Carnegie Mellon University**, Pittsburgh, PA Human-Computer Interaction Institute Graduate Research Assistant (with Justine Cassell and Amy Ogan)
Summer, 2015	**Data Science for Social Good, Atlanta** **Georgia Institute of Technology,** Atlanta, Georgia Graduate Research Assistant (with Polo Chau and Bistra Dilkina)
January, 2014 - May, 2015	**Center for 21st Century Universities** **Georgia Institute of Technology,** Atlanta, Georgia Graduate Research Assistant (with Paul Baker and Rich DeMillo)
August, 2013 - May, 2015	**Adaptive Digital Media (ADAM) Lab** **Georgia Institute of Technology,** Atlanta, Georgia Graduate Research Assistant (with Brian Magerko)

HONORS AND AWARDS

2018	**ICLS Best Paper Award**, for [C8]
2018	**ICLS Best Student Paper Nominee**, for [C8]
2018	**GovTech / MetroLab Network "Innovation of the Month" Award**, for [G2]
2017	**CSCL Naomi Miyake Best Student Paper Award**, for [C5]
2017	**EDM Student Travel Award**, for [F3]
2017	**Ford Foundation Pre-Doctoral Fellowship, Honorable Mention and Alternate**
2016	**KDD Best Student Paper Runner Up, Applied Data Science Track** [for C4]
2016	**KDD Student Travel Award**, for [F4]
2016	**Ford Foundation Pre-Doctoral Fellowship, Honorable Mention and Alternate**
2015-Present	**Program for Interdisciplinary Education Research Fellowship**, Carnegie Mellon University, for [F2]
2015	**Best Thesis Award**, Digital Media Masters Program, Georgia Tech
2011-2012	**Excellence in Teaching Award**, John F. Kennedy High School
2009	**Arts Scholar**, University of Maryland, College Park
2005-2009	**President's Scholarship**, University of Maryland, College Park

PUBLICATIONS

JOURNAL PUBLICATIONS (PEER-REVIEWED)

[J1] **"I think you just got mixed up": Confident peer tutors hedge to support partners' face needs**
Michael Madaio, Justine Cassell, Amy Ogan
In *International Journal of Computer-Supported Collaborative Learning*. 4(12), pp.401-421. December, 2017.

FULL CONFERENCE PUBLICATIONS (PEER-REVIEWED)

[C13] **"Everyone Brings Their Grain of Salt": Designing for Low-Literate Parental Engagement with a Mobile Literacy Technology in Côte d'Ivoire.**
Michael Madaio, Fabrice Tanoh, Axel Blahoua, Kaja Jasinska, Amy Ogan
In the *ACM Conference on Human Factors in Computing Systems (CHI),* April, 2019.

[C12] **A dynamic pipeline for spatio-temporal fire risk prediction**
Bhavkaran Singh Walia, Qianyi Hu, Jeffrey Chen, Fangyan Chen, Jessica Lee, Nathan Kuo, Palak Narang, Lt. Jason Batts, Geoffrey Arnold, Michael Madaio

In *Proceedings of the 2018 ACM SIGKDD Conference on Knowledge Discovery and Data Mining (*KDD*)*, August, 2018.
[12% acceptance rate]

[C11] **Designing Appropriate Learning Technologies for School vs Home Settings in Tanzanian Rural Villages**
Judith Uchidiuno, Evelyn Yarzebinski, Michael Madaio, Nupur Maheshwari, Kenneth Koedinger, Amy Ogan
In *Proceedings of the 1ˢᵗ ACM SIGCAS Conference on Computing and Sustainable Societies* (COMPASS) July, 2018.

[C10] **"I think it might help if we multiply, and not add": Detecting Indirectness in Conversation"**
Pranav Goel, Yoichi Matsuyama, Michael Madaio, Justine Cassell
In *Proceedings of the Ninth International Workshop on Spoken Dialogue Systems Technology* (IWSDS), May, 2018.

[C9] **Socially-Conditioned Task Reasoning for a Virtual Tutoring Agent**
Zian Zhao, Michael Madaio, Florian Pecune, Yoichi Matsuyama, Justine Cassell
In *Proceedings of the 17th International Conference of Autonomous Agents and Multi-Agent Systems (*AAMAS*)*, October, 2018.

[C8] **A climate of support: a process-oriented analysis of the impact of rapport on peer tutoring**
Michael Madaio, Kun Peng, Amy Ogan, Justine Cassell
In *Proceedings of the 12th International Conference of the Learning Sciences (*ICLS*)*. June, 2018.
[Best Paper Award] [Best Student Paper Nominee]

[C7] **Temporally Selective Attention Model for Social and Affective State Recognition in Multimedia Content**
Hongliang Yu, Liangke Gui, Michael Madaio, Amy Ogan, Justine Cassell, Louis-Philippe Morency
In *Proceedings of the 25th ACM SIGMM Multimedia Conference (*ACM SIGMM*)*, October, 2017

[C6] **Using Temporal Association Rule Mining to Predict Dyadic Rapport in Peer Tutoring**
Michael Madaio, Rae Lasko, Amy Ogan, Justine Cassell
In *Proceedings of the 10ᵗʰ International Conference on Educational Data Mining (*EDM*)*. June, 2017

[C5] **The Impact of Peer Tutors' Use of Indirect Feedback and Instructions.**
Michael Madaio, Justine Cassell, Amy Ogan
In *Proceedings of the 12ᵗʰ International Conference on Computer-Supported Collaborative Learning (*CSCL*)*, June, 2017
[Best Student Paper]

[C4] **Firebird: Predicting Fire Risk and Prioritizing Fire Inspections in Atlanta**
<u>Michael Madaio</u>, Shang-Tse Chen, Oliver L. Haimson, Wenwen Zhang, Xiang Cheng, Matthew Hinds-Aldrich, Duen Horng (Polo) Chau, Bistra Dilikina
In *Proceedings of the ACM SIGKDD Conference on Knowledge Discovery and Data Mining (*KDD*)* (p. 185-194), August 2016
[Best Student Paper Runner-Up] [full paper acceptance rate: 12%]

[C3] **The Effect of Friendship and Tutoring Roles on Reciprocal Peer Tutoring Strategies**
<u>Michael Madaio</u>, Amy Ogan, Justine Cassell
In *International Conference on Intelligent Tutoring Systems (*ITS*)* (pp. 423-429), June, 2016.

[C2] **Experiences with MOOCs in a West-African Technology Hub**
<u>Michael Madaio</u>, Rebecca Grinter, Ellen Zegura
In *Proceedings of the Eighth International Conference on Information-Communication Technology for Development (*ICTD*)*, June, 2016.

[C1] **Beyond bootstrapping: the Liberian iLab as a maturing community of practice.**
Ellen Zegura, Michael Madaio, Rebecca Grinter
In *Proceedings of the Seventh International Conference on Information-Communication Technology for Development (*ICTD*)*, June, 2015.

BOOK CHAPTERS

[BC1] **Who Owns the Smart City? Towards an Ethical Framework for Civic AI**
<u>Michael Madaio</u>, Sarah E. Martin
Invited Chapter in L. Scherling & A. DeRosa (Eds.), *Ethics in Design*. Bloomsbury Academic (in press).

WORKSHOP PAPERS AND REFEREED SHORT PAPERS (LIGHTLY PEER-REVIEWED)

[W4] **A Longitudinal Evaluation of a Deployed Fire Risk Model**
Jessica Lee, Yanwen Lin, <u>Michael Madaio</u>
In the *AI for Social Good workshop at the 32nd Neural Information Processing Systems Conference (NeurIPS)*. December, 2018.

[W3] **Supporting Parent-Child Literacy Interactions with Feature Phones in Cote d'Ivoire**
<u>Michael Madaio</u>, Amy Ogan
In the *HCI Across Borders* Symposium at the 2018 ACM SIGCHI *Conference on Human Factors in Computing Systems*. April, 2018.

[W2] **Exploring Student Control over Data Privacy through Speculative Design**
<u>Michael Madaio</u>
In *Spark UAL Creative Teaching and Learning Journal*. Vol 2, No 2, October, 2016.

[W1] **Identifying and Prioritizing Fire Inspections: A Case Study of Predicting Fire Risk in Atlanta**
<u>Michael Madaio</u>, Shang-Tse Chen, Oliver L. Haimson, Wenwen Zhang, Xiang Cheng, Matthew Hinds-Aldrich, Duen Horng (Polo) Chau, Bistra Dilikina
In *Bloomberg Data for Good Exchange*, September, 2015.

REGULATORY FILINGS

[RF1] **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**
Paul M.A. Baker, <u>Michael A. Madaio</u>
Federal Register Vol. 79, Number 8 (Monday, January 13, 2014) pp. 2201-2204.

GRANTS AND RESEARCH AWARDS

[G4] **Putting Data to Work: Supporting Workforce Development through Data-Driven Skill Retraining and Job Recommendations**
<u>Michael Madaio, Kenneth Holstein</u>
Metro21 Smart Cities Institute, Accepted September, 2018. $42,968

[G3] **Bridging the Gap: An NSF Workshop on Conversational Agents and Human-Robot Interaction**
Justine Cassell, Brian Scassellati, Michael Madaio, Jake Brawer
NSF Cyber-Human Systems (CHS), Robust Intelligence, National Robotics Initiative. Award #1829237
Accepted March, 2018. $49,869

[G2] **Investigating the Role of Rapport in Learning with a Virtual Peer Tutor**
<u>Michael Madaio</u>, Justine Cassell
Collaborative Research Experience for Undergraduates (CREU),
Accepted June, 2017. $9,000

[G1] **Using Spatio-Temporal Machine Learning to Inform Fire Risk Reduction**
<u>Michael Madaio</u>
Metro21 Smart Cities Institute, Accepted January, 2017. $17,600

FUNDING

[F5]	**Collaborative Research Experience for Undergraduates (CREU)**	$9,000
	National Science Foundation	2017-2018
[F4]	**Educational Data Mining Conference Travel Award**	$1,500
	International Education Data Mining Society	June, 2017
[F3]	**ACM SIGKDD Conference Student Travel Award**	$750
	Association for Computing Machinery	August, 2016

[F2]	**Program for Interdisciplinary Education Research Fellowship**	$127,500
	Institute for Education Sciences, Department of Education	2015-2018

[F1]	**Wearable Technology Design Workshop Student Travel Award**	$1,200
	National University of Singapore, CUTE Center	March, 2015

INVITED TALKS AND PRESENTATIONS

TALKS AT CONFERENCES AND SYMPOSIA (NON-ARCHIVAL)

[T7]   **How AI Can Help Us Understand Human Relationships**
Forward with Google for Education, Amsterdam, NL.
October, 2018.

[T6]   **Using Machine Learning to Design Socially-Aware Artificial Intelligence**
Google Cloud NEXT, San Francisco, CA.
July, 2018.

[T5]   **Using Google Cloud Platform and TensorFlow to Develop Socially-Aware Artificial Intelligence**
EDUCAUSE Annual Conference. Philadelphia, PA.
October, 2017.

[T4]   **Speculative Design as a Research Method to Explore Challenges in Student Data Privacy**
Designs of eLearning, The New School, and Parsons School of Design, New York, NY.
September, 2016.

[T3]   **The Possibilities and Perils of Automating Personalized Learning**
The Career, Research, and Innovation Development Conference (CRIDC), Georgia Tech.
January, 2015.

[T2]   **Learning with Autonomous Agents: Distributed Cognition in the Classroom**
The Georgia Tech Research Innovation Conference (GTRIC), Georgia Tech, GA.
January, 2014.

[T1]   **Adaptive Learning: The State of the Field**
Center for 21st Century Universities Seminar Series. Georgia Tech, GA.
April, 2015.

OTHER RESEARCH ACTIVITIES

WORKSHOPS AND PANELS CO-ORGANIZED (NOT PEER-REVIEWED)

Bridging the Gap: Bridging the Gap: An NSF Workshop on Conversational Agents and Human-Robot Interaction

Justine Cassell, Brian Scassellati, <u>Michael Madaio</u>, Jake Brawer
NSF Cyber-Human Systems (CHS), ROBUST INTELLIGENCE, National Robotics Initiative. Award #1829237
November, 2018.

Future of the Campus Workshop
Hosted by the Center for 21st Century Universities, Atlanta, GA, April, 2015.

Special Session on Technology and Innovation in Education
At the Foro de Rectores de las Américas (Forum of University Presidents), held at the 7th Summit of the Americas, Universidad Technologica de Panama, March, 2015.

MEDIA COVERAGE

[M6] How to build a civic tech community, according to Pittsburgh leaders.
      Kim Lyons, *Technical.ly*, October, 2018.

[M5] Data Tool Created By CMU Student Helps Predict Fire-Prone Buildings In Pittsburgh
      Amy Wadas, *CBS Pittsburgh*, April, 2018.

[M4] Where's the fire? This data approach is helping Pittsburgh pinpoint buildings at risk
      Adam Smeltz, *Pittsburgh Post-Gazette*, April, 2018.

[M3] At Carnegie Mellon University, machine learning gets social
      Google for Education Blog, March, 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

TEACHING EXPERIENCE AND STUDENT MENTORING

TEACHING
Fall 2017   TA, **User-Centered Research and Evaluation,** Carnegie Mellon University
Fall 2013   TA, **Introduction to Computational Media,** Georgia Institute of Technology
2009-2013   Teacher, **English Language and Literature**, John F. Kennedy High School, MD

UNDERGRADUATE SENIOR THESES SUPERVISED
Spring 2016   Lauren Trichtinger, B.S. Psychology, Chatham University
                     Accepted to Notre Dame Quantitative Psychology Ph.D., Fall 2016.

UNDERGRADUATE RESEARCH ASSISTANTS SUPERVISED [AT CMU, UNLESS OTHERWISE NOTED]
*DENOTES CO-AUTHOR

Adaolisa Annamah, B.S. in HCI and Business Administration
Michelina Astle, B.S. Psychology at Chatham University
Jake Beley, B.S. Computer Science at Dickinson College
Rishabh Chatterjee, B.S. Computer Science
Naomi Eigbe, B.S. Psychology and Computer Science at Rice University
Alvaro Granados, B.S. Neuroscience at University of Pittsburgh
Robert Huerbin, B.S. Psychology, at University of Pittsburgh
*Rae Lasko, B.S. Cognitive Science
Sarah Lehman, B.S. Psychology at Chatham University
*Jessica Lee, B.S. Computer Science
Tiffany Lee, B.S. Computer Science
Jeffrey Li, B.S. Computer Science
William Liu, B.S. Cognitive Science
*Kun Peng, B.S. Statistics and Machine Learning
Lynnette Ramsay, B.S. Cognitive Science
Vanessa Siriwalothakul, B.S. Computer Science
Michelle Tai, B.S. Human-Computer Interaction
Anne Widom, B.S. Psychology
Caroline Wu, B.S. Computer Science
Shelby Zasacky, B.S. Mathematical Sciences and Art
*Zian Zhao, B.S. Information Engineering at Shanghai Jiao Tong University

MASTERS RESEARCH ASSISTANTS SUPERVISED
Mohammed Alburaiki, Masters in Educational Technology and Learning Science
Carolina Arroyo Hernandez, Masters in Public Policy and Management, Data Analytics
*Qianyi Hu, Masters in Information Systems Management
Sara Jackson, Masters in Public Policy and Management, Data Analytics
*Yanwen Lin, Masters in Civil and Environmental Engineering
*Bhavkaran Singh, Masters in Information Systems Management

SERVICE
REVIEWING
ACM SIGCHI 2016-2019
Artificial Intelligence in Education, 2017, 2018
IJAIED, 2018
JEDM, 2018
JENG, 2018
Public Opinion Quarterly, 2016
Spark UAL Creative Teaching and Learning Journal, 2017

CARNEGIE MELLON UNIVERSITY
HCI Student Co-Ombudsman (2016-2017)
PIER Speaker Series Coordinator (2016-2018)
Associate Director, Students Using Data for Social Good (2017-2019)

EXTERNAL
Mentor for Uptake.org Data Science for Social Good Fellows (2018)