

Michael A. Madaio

Human-Computer Interaction Institute
School of Computer Science
Carnegie Mellon University

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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 **Masters 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

- August 2015 - Present **Carnegie Mellon University**, Pittsburgh, PA
ArticuLab, Human-Computer Interaction Institute
Graduate Research Assistant (with Justine Cassell and Amy Ogan)
National Science Foundation-funded project entitled: “Partners in Learning: Building rapport with a virtual peer tutor”
- Summer, 2015 **Data Science for Social Good, Atlanta**
Georgia Institute of Technology, Atlanta, Georgia
Graduate Research Assistant (with Polo Chau and Bistra Dilkina)
Project: “Predicting Fire Risk and Prioritizing Fire Inspections in Atlanta”
- 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

- 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
International Journal of Computer-Supported Collaborative Learning (in preparation)

FULL CONFERENCE PUBLICATIONS (PEER-REVIEWED)

- [C9] **Socially-Conditioned Task Reasoning for a Virtual Tutoring Agent**
Zian Zhao, Michael Madaio, Florian Pecune, Yoichi Matsuyama, Justine Cassell
Submitted to *Proceedings of the 17th International Conference of Autonomous Agents and Multi-Agent Systems (AAMAS)*, (under review).
- [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
Submitted to *Proceedings of the 12th International Conference of the Learning Sciences (ICLS)*, (under review).
- [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, 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**
Michael Madaio, 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
[full paper acceptance rate: 12%] [Best Student Paper Runner-Up]
- [C3] **The Effect of Friendship and Tutoring Roles on Reciprocal Peer Tutoring Strategies**
Michael Madaio, 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**
Michael Madaio, 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

- [B1] **Towards an Ethics of Machine Learning for the “Smart City”**
Michael Madaio, Sarah E. Martin
Invited Chapter in L. Scherling & A. DeRosa (Eds.), *Ethics in Design*. Bloomsbury Academic (under review).

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

- [W2] **Exploring Student Control over Data Privacy through Speculative Design**
Michael Madaio
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**
Michael Madaio, 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, Michael A. Madaio
Federal Register Vol. 79, Number 8 (Monday, January 13, 2014) pp. 2201-2204.
Washington, DC.

GRANTS AND RESEARCH AWARDS

- [G3] **Investigating the Role of Rapport in Learning with a Virtual Peer Tutor**
Michael Madaio, Justine Cassell
Collaborative Research Experience for Undergraduates (CREU),
Accepted June, 2017. \$9,000 USD
- [G2] **Towards a Risk-Based Fire Inspection Strategy using Spatio-Temporal Machine Learning**
Michael Madaio
Metro21 Initiative for Smart Cities, Accepted January, 2017. \$12,000 USD
- [G1] **Grounding Task Behavior in the Social World: Deep Reinforcement Learning for Social Dialogue to Improve Task Performance**
Justine Cassell, Ran Zhao, Yoichi Matsuyama, Michael Madaio
Google Faculty Award, Accepted December, 2016. \$150,000 USD

FUNDING

- [F6] **Collaborative Research Experience for Undergraduates (CREU) Grant** \$9,000
National Science Foundation 2017-2018
- [F5] **Research, Development, and Deployment Small Projects Grant** \$12,000
Metro21 Initiative, MetroLab Network 2017
- [F4] **Educational Data Mining Conference Travel Award** \$1,500

	International Education Data Mining Society	June, 2017
[F3]	ACM SIGKDD Conference Student Travel Award Association for Computing Machinery	\$750 August, 2016
[F2]	Program for Interdisciplinary Education Research Fellowship Institute for Education Sciences, Department of Education	\$127,500 2015-2018
[F1]	Wearable Technology Design Workshop Student Travel Award National University of Singapore, CUTE Center	\$1,200 March, 2015

MEDIA COVERAGE

- [M6] Can Algorithms Predict House Fires?
Jonathan Jay
Data-Smart City Solutions, March 2017
- [M5] Big Data: Providing Fire Service and Emergency Response Communities with Tools to Predict and Respond
Rodrigo Nieto
Medium, January, 2017
- [M4] The Advent of Virtual Humans
Jon Skillings
CNET, June 2016
- [M3] S.A.R.A Seeks to Give Artificial Intelligence People Skills
Xavier Harding
Popular Science, October, 2016
- [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

PRESENTATIONS

TALKS AT CONFERENCES AND SYMPOSIA (NON-ARCHIVAL)

- [P5] **Using Google Cloud Platform and TensorFlow to Develop Socially-Aware Artificial Intelligence**
Michael Madaio
As part of the *Power What's Possible* panel at the EDUCAUSE Annual Conference. Philadelphia, PA. October, 2017.

- [P4] **Speculative Design as a Research Method to Explore Challenges in Student Data Privacy**
Michael Madaio
Designs of eLearning, The New School, and Parsons School of Design, New York, NY, September, 2016.
- [P3] **The Possibilities and Perils of Automating Personalized Learning**
Michael Madaio
The Career, Research, and Innovation Development Conference (CRIDC), Georgia Tech, January, 2015.
- [P2] **Learning with Autonomous Agents: Distributed Cognition in the Classroom**
Michael Madaio
The Georgia Tech Research Innovation Conference (GTRIC), Georgia Tech, January, 2014.
- [P1] **Adaptive Learning: The State of the Field**
Michael Madaio
Center for 21st Century Universities Seminar Series. Georgia Tech, April, 2015.

OTHER RESEARCH ACTIVITIES

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

Future of the Campus Workshop

Hosted by the Center for 21st Century Universities, at Georgia Institute of Technology, 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 Tecnológica de Panama, March, 2015.

WORKSHOPS ATTENDED

Wearable Technology Design Workshop

Hosted by the National University of Singapore CUTE Center, in partnership with Georgia Institute of Technology, March, 2015.

TEACHING EXPERIENCE AND STUDENT MENTORING

TEACHING ASSISTANTSHIPS

Fall 2013 **Introduction to Computational Media**, Georgia Institute of Technology

Instructor: Ian Bogost

Fall 2017 **User-Centered Research and Evaluation**, Carnegie Mellon University

Instructor: Amy Ogan

INSTRUCTOR OF RECORD

2009-2013 **English Language and Literature**, John F. Kennedy High School
Silver Spring, 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]

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

MASTERS RESEARCH ASSISTANTS SUPERVISED

Bhavkaran Singh, Masters in Information Systems Management
Qianyi Hu, Masters in Information Systems Management

SERVICE

CONFERENCE STUDENT VOLUNTEERING

ACM SIGKDD, 2016

REVIEWING

ACM SIGCHI 2016, 2017
ACM SIGCHI PLAY 2017
AI in Education, 2017
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 for Urban Data Systems (2017-2018)