

# Michael A. Madaio

michaelmadaio.com | mmadaio@cs.cmu.edu | 410-812-9851

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

## 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 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* (under review)

### FULL CONFERENCE PUBLICATIONS (PEER-REVIEWED)

- [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 10<sup>th</sup> International Conference on Educational Data Mining (EDM)*. June, 2017  
[short paper acceptance rate: 42%]

- [C5] **The Impact of Peer Tutors' Use of Indirect Feedback and Instructions.**  
Michael Madaio, Justine Cassell, Amy Ogan  
 In *Proceedings of the 12<sup>th</sup> International Conference on Computer-Supported Collaborative Learning (CSCL)*, June, 2017  
 [acceptance rate: 35%] [**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  
 [short paper acceptance rate: 27%]
- [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.  
 [acceptance rate: 36%]
- [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.  
 [acceptance rate: 35%]

## 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 (in preparation).

## 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.

## 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

## GRANTS AND RESEARCH AWARDS

[G4] **A Framework for Crowdsourced Training of Socially-Aware Reinforcement Learning for Multimodal Dialogue Management**

Yoichi Matsuyama, Florian Pecune, Michael Madaio  
*Amazon Research Award*, September, 2017 (in submission) \$80,000 USD

- [G3] **Investigating the Role of Rapport in Learning with a Virtual Peer Tutor**  
Michael Madaio, Justine Cassell  
*Collaborative Research Experience for Undergraduates (CREU)*,  
 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*, 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** \$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

## 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.

#### INVITED TALKS AND GUEST LECTURES

[P1] **Adaptive Learning: The State of the Field**

Michael Madaio

Center for 21<sup>st</sup> 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 21<sup>st</sup> 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 7<sup>th</sup> 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**

Rae Lasko, B.S. Cognitive Science  
Michelle Tai, B.S. Human-Computer Interaction  
Lynnette Ramsay, B.S. Cognitive Science  
Caroline Wu, B.S. Computer Science  
Rishabh Chatterjee, B.S. Computer Science  
Tiffany Lee, B.S. Computer Science  
Jeffrey Li, B.S. Computer Science  
Kun Peng, B.S. Statistics and Machine Learning  
Zian Zhao, B.S. Information Engineering at Shanghai Jiao Tong University  
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  
Michelina Astle, B.S. Psychology at Chatham 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**

*Spark UAL Creative Teaching and Learning Journal*, 2017  
ACM SIGCHI 2016, 2017  
ACM SIGCHI PLAY 2017  
AI in Education, 2017  
*Public Opinion Quarterly*, 2016

**CARNEGIE MELLON UNIVERSITY**

HCI Student Ombudsman (2016-2017)  
PIER Speaker Series Coordinator (2016-2018)  
Associate Director, Students for Urban Data Systems (2017-2018)