

Michael L. Rivera

University of Colorado Boulder
Roser ATLAS Center
1125 18th St. 320 UCB
Boulder, CO 80309-0320

Email: mrivera@colorado.edu
Website: <https://mikeriv.com>
Google Scholar: <http://bit.ly/mikerivGS>
Github: [mriveralee](#)

RESEARCH INTERESTS

Human-Computer Interaction (HCI), Personal Fabrication, 3D Printing, Environmental Sustainability, Computer Graphics

ACADEMIC EMPLOYMENT

University of Colorado Boulder, College of Engineering & Applied Science 2023 - Present
Assistant Professor, ATLAS Institute and Department of Computer Science

University of Colorado Boulder, ATLAS Institute 2022
Computing Innovation Fellow 2021 and Post-Doctoral Researcher

Carnegie Mellon University, School of Computer Science 2014 - 2021
Doctoral Researcher in the Human-Computer Interaction Institute

EDUCATION

Carnegie Mellon University, School of Computer Science
Ph.D. in Human-Computer Interaction 2021
Thesis: Digital Fabrication Techniques for 3D Printing with Everyday Materials
Committee: Scott Hudson (Chair), Lining Yao, Jeffrey Bigham, Stefanie Mueller

M.S. in Human-Computer Interaction 2019

University of Pennsylvania, School of Engineering & Applied Science
M.S.E. in Computer Graphics and Game Technology 2014
Thesis: From Image to Device: A Case Study on 3D Printing for Patient-Specific Care
Advisor: Norman Badler

B.S.E. in Digital Media Design, *cum laude* 2014

SELECTED AWARDS AND HONORS

Computing Innovation Postdoctoral Fellow 2021 (\$281,938) 2021

Best Student Paper Award, ACM ASSETS 2021 2021

Google - CMD-IT LEAP Alliance Fellowship (\$25,000) 2020

NSF Diversifying Leadership in the Professoriate (LEAP) Alliance Fellow 2019

Best Provocation Honorable Mention, ACM DIS 2018 2018

Adobe Research Fellowship, Honorable Mention (\$2000) 2017

Xerox Technical Minority Scholarship, Recipient (\$1000) 2017

Carnegie Mellon University Sansom Endowed Presidential Fellowship (\$60,000) 2017
McNair Scholars/Pre-Doctoral Initiative Fellow (University of Pennsylvania) 2013

PEER-REVIEWED PUBLICATIONS

- [C10] Stephanie Valencia, Mark Steidl, **Michael Rivera**, Cynthia Bennett, Jeffrey Bigham, and Henry Admoni. 2021. Aided Nonverbal Communication through Physical Expressive Objects. In Proceedings of the 23rd International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS '21). Association for Computing Machinery, New York, NY, USA, Article 43, 1–11. <https://doi.org/10.1145/3441852.3471228>
★ **Best Student Paper Award**
- [C9] Yu-Ning Huang, Siyan Zhao, **Michael L. Rivera**, Jason I. Hong, and Robert E Kraut. 2021. Predicting Well-being Using Short Ecological Momentary Audio Recordings. In Extended Abstracts of the 2021 CHI Conference on Human Factors in Computing Systems (CHI EA '21). Association for Computing Machinery, New York, NY, USA, Article 306, 1–7. <https://doi.org/10.1145/3411763.3451629>
- [C8] Saiganesh Swaminathan, Jonathon Fagert, **Michael Rivera**, Andrew Cao, Gierad Laput, Hae Young Noh, and Scott E. Hudson. 2020. OptiStructures: Fabrication of Room-Scale Interactive Structures with Embedded Fiber Bragg Grating Optical Sensors and Displays. Proc. ACM Interact. Mob. Wearable Ubiquitous Technol. 4, 2, Article 50 (June 2020), 21 pages. <https://doi.org/10.1145/3397310>
- [C7] **Michael L. Rivera**, Jack Forman, Scott E. Hudson, and Lining Yao. 2020. Hydrogel-Textile Composites: Actuators for Shape-Changing Interfaces. In Extended Abstracts of the 2020 CHI Conference on Human Factors in Computing Systems (CHI EA '20). Association for Computing Machinery, New York, NY, USA, 1–9. <https://doi.org/10.1145/3334480.3382788>
- [C6] Anhong Guo, Junhan Kong, **Michael Rivera**, Frank F. Xu, and Jeffrey P. Bigham. 2019. StateLens: A Reverse Engineering Solution for Making Existing Dynamic Touchscreens Accessible. In Proceedings of the 32nd Annual ACM Symposium on User Interface Software and Technology (UIST '19). Association for Computing Machinery, New York, NY, USA, 371–385. <https://doi.org/10.1145/3332165.3347873>
Acceptance Rate: 24.4%
- [C5] **Michael L. Rivera** and Scott E. Hudson. 2019. Desktop Electrospinning: A Single Extruder 3D Printer for Producing Rigid Plastic and Electrospun Textiles. In Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems (CHI '19). Association for Computing Machinery, New York, NY, USA, Paper 204, 1–12. <https://doi.org/10.1145/3290605.3300434>
Acceptance Rate: 23.8%
- [C4] Saiganesh Swaminathan, **Michael Rivera**, Runchang Kang, Zheng Luo, Kadri Bugra Ozutemiz, and Scott E. Hudson. 2019. Input, Output and Construction Methods for Custom Fabrication of Room-Scale Deployable Pneumatic Structures. Proc. ACM Interact. Mob. Wearable Ubiquitous Technol. 3, 2, Article 62 (June 2019), 17 pages. <https://doi.org/10.1145/3328933>
- [C3] Joselyn McDonald, Siyan Zhao, Jen Liu, and **Michael L. Rivera**. 2018. MaxiFab: Applied Fabrication to Advance Period Technologies. In Proceedings of the 2018 ACM Conference Companion Publication on Designing Interactive Systems (DIS '18 Companion). Association for Computing Machinery, New York, NY, USA, 13–19.

<https://doi.org/10.1145/3197391.3205405>

★ **Best Provocation Honorable Mention Award**

- [C2] **Michael L. Rivera**, Melissa Moukperian, Daniel Ashbrook, Jennifer Mankoff, and Scott E. Hudson. 2017. Stretching the Bounds of 3D Printing with Embedded Textiles. In Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems (CHI '17). Association for Computing Machinery, New York, NY, USA, 497–508.
<https://doi.org/10.1145/3025453.3025460>
Acceptance Rate: 25%

- [C1] Jorge A. Gálvez, Allan F. Simpao, Yoav Dori, Kevin Gralewski, Nicholas H. McGill, **Michael L. Rivera**, Nile Delso, Hammad Khan, Mohamed A. Rehman, and John E. Fiadjo. 2016. Not Just a Pretty Face: Three-Dimensional Printed Custom Airway Management Devices. 3D Printing and Additive Manufacturing 3, 160–165. <https://doi.org/10.1089/3dp.2016.0025>
★ **Society for Technology in Anesthesia 2014 Engineering Challenge Winner**

BOOK CHAPTERS

- [B1] **Rivera, M.L.**, Mankoff, J., Hudson S.E. 2018. Embedded and Printed: Approaches to 3D Printing with Textiles. *Trendbook Technical Textiles / Technische Textilien* (July 2018). 16-19.

POSTERS AND DEMONSTRATIONS

- [D2] **Rivera, M.L.**, Moukperian, M., Ashbrook, D., Mankoff, J., Hudson, S.E. 2017. Stretching the Bounds of 3D Printing with Embedded Textiles. Carnegie Mellon University's 3D Printing Summit. Pittsburgh, PA.
- [D1] **Rivera, M.L.**, Moukperian, M., Ashbrook, D., Mankoff, J., Hudson, S.E. 2016. Stretching the Bounds of 3D Printing with Embedded Textiles. Carnegie Mellon University's DIY Assistive Technology Summit. Pittsburgh, PA.

PATENTS

- [P2] Saiganesh Swaminathan, Jonathan Fagert, Scott Hudson, Haeyoung Noh, **Michael Rivera**, Gierad Laput, Andrew Cao. System and Method for OptiStructures: Fabrication of Room-Scale Interactive Structures with Embedded Fiber Bragg Grating Optical Sensors and Displays. U.S. Patent Application. Filed November 14, 2020.
- [P1] Anhong Guo, Junhan Kong, **Michael Rivera**, Frank F. Xu, Jeffrey P. Bigham. StateLens: A Reverse Engineering Solution for Making Existing Dynamic Touchscreens Accessible. U.S. Patent Application 19/207. Filed June 6, 2019.

ACADEMIC SERVICE

2022 Experimental Weaving Residency Board Member , ATLAS Institute	2021
Special Recognition for Outstanding Review , ACM UIST 2021	2021
Special Recognition for Outstanding Review , ACM CHI 2020	2020
Proceedings Chair , ACM UIST 2019	2019
Logistics Chair , ACM Symposium on Computational Fabrication (SCF) 2019	2019

Session Chair, ACM CHI 2019 - Fabricating Electronics 2019
Hiring Committee Representative, HCII, Carnegie Mellon University 2019
Dean's Student Advisory Council, HCII, Carnegie Mellon University 2017
Department Ombudsman, HCII, Carnegie Mellon University 2017
PhD Open House Organizer, HCII, Carnegie Mellon University 2017
Student Volunteer, ACM CHI 2017 2017
Student Volunteer, 3D Printing Summit, Carnegie Mellon University 2017
Student Volunteer, DIY Assistive Tech. Summit, Carnegie Mellon University 2016

Academic Paper Reviewer

ACM CHI 2017 - 2023
ACM UIST 2018 - 2022
ACM TEI 2018 - 2020
ACM DIS 2018 - 2022
ACM IMWUT 2022
ACM SCF 2018
NIME 2018, 2019

INVITED TALKS

University of Colorado Boulder, ATLAS Institute Colloquium Apr 2022
Boulder, CO - Hosted by Ellen Do
Beyond Plastic: Expanding Creativity and Invention in 3D Printing with Everyday Materials

Massachusetts Institute of Technology, HCI Engineering Group Apr 2021
Boston, MA (Virtual) - Hosted by Stefanie Mueller
Material-Driven Processes for Digital Fabrication

George Mason University, Computer Science Seminar Apr 2021
Fairfax, VA (Virtual) - Hosted by Yotam Gingold
Enabling Computation, Control and Customization of Materials with Digital Fabrication Processes

University of Maryland, Baltimore County, Department of Computer Mar 2021
Science and Electrical Engineering
Baltimore, MD (Virtual) - Hosted by Richard Chang and Shimei Pan
Enabling Computation, Control and Customization of Materials with Digital Fabrication Processes

Purdue University, Department of Computer Graphics Technology Mar 2021
West Lafayette, IN (Virtual) - Hosted by Bedrich Benes
Enabling Computation, Control and Customization of Materials with Digital Fabrication Processes

Temple University, Computer and Information Sciences Colloquium Mar 2021
Philadelphia, PA (Virtual) - Hosted by Xubin (Ben) He

Enabling Computation, Control and Customization of Materials with Digital Fabrication Processes

University of Colorado Boulder, Computer Science Colloquium Feb 2021
Boulder, CO (Virtual) - Hosted by Daniel Leithinger
Enabling Computation, Control and Customization of Materials with Digital Fabrication Processes

University of Pennsylvania, Penn-Interdisciplinary Talks Apr 2014
Philadelphia, PA
Tracheal Aire – a step towards patient-specific medical instruments

Society for Technology in Anesthesia, Engineering Challenge 2014 Jan 2014
Orlando, FL
Tracheal Aire: Patient-specific 3D Printable Williams Airway Intubators

University of Maryland, Baltimore County, McNair Scholars Conference Sept 2013
Baltimore, MD
Project PAALM: Phalangeal Angle Approximation through the Leap Motion Controller

University of Pennsylvania, Big Think Innovation Conference, Mar 2013
Philadelphia, PA
Hacking New Frontiers: 3D Gesture Recognition

RESEARCH GRANTS AND SUPPORT

CU RISE Summer Seed Grant 2022
University of Colorado Boulder, Resilient Infrastructure with Sustainability and Equity Interdisciplinary Research Theme
Title: Open-Source Fiber-Spinning for Sustainable Resilient Infrastructure
Role: Co-PI with Laura Devendorf, University of Colorado Boulder
Amount: \$7,000

Computing Innovation 2021 Fellowship 2022 - 2023
National Science Foundation, Computing Research Association and Computing Community Consortium
Title: Computationally-Supported Craft: Design Tools for Sustainable Smart Textiles Manufacturing
Role: Co-PI with Laura Devendorf, University of Colorado Boulder
Amount: \$281,931

Google - CMD-IT LEAP Alliance Dissertation Fellowship 2020
Google, Center for Minorities and People with Disabilities in Information Technology, and the Diversifying Leadership in the Professoriate Alliance
Title: Advancing Personal 3D Printing with Everyday Materials
Role: PI
Amount: \$25,000

PROFESSIONAL EMPLOYMENT

HP Labs , Research Intern Examined piezoresistive materials for 3D printing in the Immersive Experiences Lab.	Jul 2017 - Aug 2017
Facebook , New York, NY Software Engineer iOS and Android Product Engineer on the Places Team. Implemented modular result cards for Nearby Places on Facebook for iOS. Built Nearby Places on Android. Developed an edit flow for Places Home Creation on Facebook for iOS.	Jul 2014 - Aug 2015
Facebook , Menlo Park, CA Software Engineer Intern Android Engineer on the Facebook Home Team. Built a scalable view pager with spring animations for the application launcher of Facebook Home on Android.	May 2013 - Aug 2013
LinkedIn , Software Engineer Intern Mountain View, CA iOS and Mobile Web Engineer for the Mobile Team. Developed event bubble display items and an internal settings module for an iOS calendar widget library. Implemented the 'Send Congrats' feature for the LinkedIn mobile web application.	May 2012 - Aug 2012

TEACHING EXPERIENCE

Assistant Professor , University of Colorado Boulder, Boulder, CO Object (ATLS 3300), 37 students Graduate Research Methods (ATLS 7500), 15 students	Spring 2023 Fall 2022
Teaching Assistant , Carnegie Mellon University, Pittsburgh, PA User-Centered Research and Evaluation (05-410 / 05-610) Software Systems for User Interfaces (05-431 / 05-631)	Fall 2018 Fall 2016
Teaching Assistant , University of Pennsylvania, Philadelphia, PA Digital Media Design Capstone Project Course (CIS-497) Digital Media Design Capstone Project Course (CIS-497) Introduction to Java Programming (CIS-110) Software Design and Engineering (CIS-350)	Spring 2014 Fall 2013 Fall 2013 Spring 2013
Invited Guest Lectures <i>Creativity and Invention with 3D Printing</i> , Creative Technologies (ATLS 5410), University of Colorado Boulder	Spring 2022
<i>3D Modeling for 3D Printing</i> , Building User-Focused Sensing Systems (08-421 / 08-735), Carnegie Mellon University	Spring 2017

Teaching Development

Future Faculty Program, Eberly Center Teaching Excellence and Education Innovation, Carnegie Mellon University 2016 - 2021

RESEARCH MENTORING

Primary Doctoral Advisor

Krithik Ranjan, ATLAS PhD (co-advised with Ellen Do) 2022 - Present

Comprehensive Exam Committee

Peter Gyory, ATLAS PhD 2022

Purnendu, ATLAS PhD 2022

Preliminary Exam Committee

Eldy Lazaro Vasquez, ATLAS PhD 2023

Master's Thesis Advisor

William Harris, ATLAS MS 2023

Undergraduate Research Supervision

Henry Miles Lewis, ATLAS CTD 2022 - Present

Other Mentorship

Sandra Bae, ATLAS PhD 2022 - Present

Aishwarya Pravin, Mechanical Engineering PhD 2023 - Present

Research Mentorship at Carnegie Mellon University

Yi-Chin Lee (Computational Design, Graduate) 2020

Aditi Dhabalia (Architecture, Undergraduate) 2019 - 2020

Joanna McAllister (Tangible Media, Undergraduate) 2019

Jack Forman (Materials Science, Undergraduate) 2019

Yiyuan Wang (Mechanical Engineering, Graduate) 2018 - 2019

Nachiket Parulekar (Mechanical Engineering, Graduate) 2018

Yunzhi Li (Computer Science, Undergraduate) 2018

Kayla Yew (Mechanical Engineering, Undergraduate) 2017 - 2018

Shreya Bali (Computer Science, Undergraduate) 2017

Academic Mentoring

Peer Counselor (12 students), University of Pennsylvania College 2010 - 2014

Achievement Program (PENNCAP)

SELECTED PRESS COVERAGE

Google, "[New awards support future leaders of computing research](#)" Oct 2020

Hackaday, "[Use A 3D Printer To Electrospin Textiles](#)" Apr 2019

3D Printing Industry, "[CMU researchers on the desktop 3D printer turning rigid plastics to fabrics](#)" Apr 2019

Carnegie Mellon University, "[HCI students win Bose Challenge, Designing](#)" Dec 2018

for Augmented Reality with Sound”

Real Industry, “Bose Challenge: Carnegie Mellon University” Oct 2018

3Ders, “Carnegie Mellon research project combines 3D printing with embedded textiles” July 2017

3D Printing Industry, “Research embeds textiles in 3D printing for functional, flexible parts” July 2017

3DPrinting.com, “Researchers 3D Print Flexible Textiles For Development of Functional Objects” July 2017

3D Shoes, “3D Printing Combined with Textile Manufacturing” June 2017

IEEE Spectrum, “Mechanical Metamaterials and Other 3D Printing Tech from CHI 2017” May 2017

MedCity News, “Pediatric hospital physicians form 3D printing ‘think tank’” Feb 2014

MAKE Magazine, “Hacking on the Frontier of Gestural Input” Feb 2013

TECHNICAL SKILLS

Fabrication

3D Modeling, 3D Printing, Laser Cutting, Metalsmithing, Woodworking

Hardware Development

Mechanical Design, PCB Design, Hardware I/O

Programming Languages

Java, Javascript, Python, Objective-C, C++, C, Swift, Kotlin

Software Development

Android, iOS, Arduino, OpenGL, WebGL, Node.js, Flask, React, JQuery

MISCELLANEOUS

Co-Captain, Intramural Flag Football, Carnegie Mellon University 2015 - 2019

Student Representative, Undergraduate Assembly, University of Pennsylvania 2011 - 2012

Academic Support Coordinator, University of Pennsylvania College Achievement Program (PENNCAP) 2010 - 2011

REFERENCES

Scott E. Hudson

Professor
Human-Computer Interaction Institute
School of Computer Science
Carnegie Mellon University
scott.hudson@cs.cmu.edu

Lining Yao

Assistant Professor
Human-Computer Interaction Institute
School of Computer Science
Carnegie Mellon University
liningy@cs.cmu.edu

Jeffrey P. Bigham

Associate Professor
Human-Computer Interaction Institute
Language Technologies Institute
School of Computer Science
Carnegie Mellon University
jbigham@cs.cmu.edu

Laura Devendorf

Assistant Professor
ATLAS Institute and Information Science
School of Engineering & Applied Science
University of Colorado Boulder
laura.devendorf@colorado.edu

Stefanie Mueller

Associate Professor
Electrical Engineering and Computer Science
Joint Appointment with Mechanical Engineering
Massachusetts Institute of Technology
stefanie.mueller@mit.edu

Rafael 'Tico' Ballagas

Senior Manager
Immersive Experiences Lab
HP Labs
tico.ballagas@hp.com