# Amanda Ghassaei

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## EDUCATION

**MIT** MS Media Arts and Sciences, MIT Media Lab
Fall 2014 - Fall 2016 | Cambridge, MA
Master's Thesis: Rapid Design and Simulation of Functional Digital Materials advised by Neil Gershenfeld

**POMONA COLLEGE** BA Physics, Minor Chemistry
Fall 2007 - Spring 2011 | Claremont, CA
Senior Thesis: Design and Optimization of a Crank-Based Leg Mechanism advised by Dwight Whitaker

## EXPERIENCE

**SOFTWARE/DESIGN CONSULTING** | Freelance
July 2020 - present | San Francisco, CA

**ADOBE RESEARCH** | Research Engineer
March 2018 - July 2020 | San Francisco, CA

- Lead developer of Fantastic Fold — a design tool for folded packaging
- Presented live demo for an audience of 14,000 at Adobe MAX - Adobe's annual public-facing conference
- 3 Patents filed, mentored 4 PhD students as summer interns

**MIT CENTER FOR BITS AND ATOMS** | Research Assistant
Sept 2014 - Dec 2017 | Cambridge, MA

- GPU-accelerated origami physics engine with WebVR interface: Origami Simulator
- GPU-accelerated finite element solver for discretely-assembled robotic systems: AMOEBA
- Reconstruction techniques for 3D curvi-planar surfaces from volumetric CT scan data: Locked Letters
- Computational Fluid Dynamics simulation with WebGL: Mixed Grid-Particle Methods • Vortex Shedding
- Design/Simulation/Optimization tools: Shell Form Finding • Truss Opt • Linkages • Michell Cantilever
- Mentored a high school student researcher (2016-2018)

**NASA** | Visiting Researcher
Summer 2015 | Ames Research Center, Mountain View, CA

- Developed CAD tools and path planning strategies for robotically-assembled aerospace structures

**AUTODESK / INSTRUCTABLES** | Software Engineer / Assistant Tech Editor
Jan 2012 - Aug 2014 | San Francisco, CA

- Lead developer of Instructables iPad app and iPhone iOS7 redesign - featured in the App Store (2014)
- DIY editorial and tech content — including sponsored content for RadioShack and Jameco Electronics

## PUBLICATIONS

Dambrogio* J, Ghassaei* A, Smith** DS, Jackson** H, Demaine M, Davis G, Mills D, Ahrendt R, Akkerman N, van der Linden D, Demaine E. Unlocking history through automated virtual unfolding of sealed documents imaged by X-ray microtomography. Nature Communications — 2021

Kim J, Zhou Q, Ghassaei A, Chen X. OmniSoft: A Design Tool for Soft Objects by Example. Proceedings of International Conference on Tangible, Embedded, and Embodied Interaction — 2021

Ghassaei A, Demaine E, Gershenfeld N. Fast, Interactive Origami Simulation Using GPU Computation. 7th International Meeting on Origami in Science, Mathematics and Education — 2018

Langford W, Ghassaei A, Jenett B, Gershenfeld N. Hierarchical Assembly of a Self-Replicating Spacecraft. IEEE Aerospace — 2017

Langford W, Ghassaei A, Gershenfeld N. Automated Assembly of Electronic Digital Materials. — 2016

Proceedings of the 2016 Manufacturing Science and Engineering Conference

Crowther A, Ghassaei A, Jung N, Brus L. Strong Charge-Transfer Doping of 1 to 10 Layer Graphene by $NO_2$ Journal of the American Chemical Society Nano 2012

GitHub — various open source projects 2013-present

## INVITED TALKS

**Lawrence Berkeley National Laboratory** "The Art and Science of Folding" Berkeley, CA 2022

**UC Berkeley Field Notes Distinguished Lecture Series** "Design / Simulation / Fabrication" Berkeley, CA 2019

**Stanford HCI Lunch Seminar** "Origami Simulator and Other Research Tools" Palo Alto, CA 2019

**Uber Data Visualization Nights** , "Building an Origami Simulator in WebGL" San Francisco, CA 2018

## SKILLS

**Web:** WebGL, glsl, Node.js, Three.js, WebXR, React, Vue, D3, JQuery, HTML, CSS, Electron

**Programming:** Typescript, JavaScript, Python, C++ (embedded), Objective C/iOS, CUDA, OpenCL, MATLAB, Mathematica, Jupyter Notebooks, MaxMSP, PureData, Processing, Git

**2D / 3D Design:** Fusion 360, Solidworks, Onshape, Blender, Eagle (PCBs), Photoshop, Illustrator, Premiere Pro

**Fabrication Tools:** Machine shop and wood shop, laser cutter, 3D printer (FDM, polyjet), waterjet cutter, ShopBot, Tormach, 3/4/5 axis milling and toolpathing with HSMWorks

**Electronics:** Atmel AVR, Mbed (ARM), Arduino, PCB design and fabrication, analog and digital circuit design

## TEACHING

How to Make (Almost) Anything TA for graduate course at **MIT Media Lab** , Cambridge, MA 2015-2018

Fab Lab installation and training in Armenia , Rwanda , and Bhutan 2015-2017

Intro to Arduino , Intro to MaxMSP Workshops at **Women's Audio Mission** , San Francisco, CA 2013/2014

Arduino and MIDI Workshop at **California College of the Arts** , San Francisco, CA 2013

## SELECTED MEDIA COVERAGE

New Technique Reveals Centuries of Secrets in Locked Letters New York Times 2021

Reading A Letter That's Been Sealed For More Than 300 Years — Without Opening It NPR 2021

Origami in reverse: Cracking the security on a trove of 17th-century letters The Economist 2021

A Letter Sealed for Centuries Has Been Read—Without Even Opening It Wall Street Journal 2021

Adam Savage's Maker Tour: MIT's Center for Bits and Atoms Tested 2017

Amanda Ghassaei: Design, Sound, and Science Ableton 2014

Bloc Party's Kele Okereke to release 3D-printed record for charity The Guardian 2013

Laser-Cut Wooden Records Give New Meaning to Tree Rings Wired 2013

3-D printing guitars and records CNN 2013

Listen To The First 3-D-Printed Records Ever Made Fast Company 2013

First 3-D Printed Records Sound Awful – And Amazing Wired 2012

## BOOK FEATURES

"3D Printed Records," Vinyl World by Markus Caspers, **Teneues** 2021

"Replicator Roadmap," Active Matter edited by Skylar Tibbits, **MIT Press** 2017

"3D Printed Records," Printing Things by C Warnier and D Verbruggen, **Gestalten** 2014

# EXHIBITIONS

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|---|---|
| Interactive Fluid Simulations, File Festival Sao Paulo | 2018 |
| Origami Simulator and Interactive Fluid Simulation, **Google IO** Mountain View, CA | 2018 |
| 3D printed record pop-up store , **Bacardi Beginnings** London | 2013 |
| "3D Printed Records" Official Selection, **Imagine Science Film Festival** New York, NY | 2013 |
| Various Projects **Autodesk Design Night** San Francisco, CA | 2012/2013 |
| 3D Printed Records INVISIBLE DESIGN , **Milan Design Week** Milan | 2013 |
| 3D Printed Records **SXSW Create** Austin, TX | 2013 |