MADELINE GANNON, PhD

madeline@atonaton.com

www.atonaton.com

+1 239 826 6696

Dr. Madeline Gannon is a multidisciplinary designer and researcher inventing better ways to communicate with machines. Also known as the "Robot Whisperer", she specializes in convincing robots to do things they were never intended to do. Her work blends techniques in art, design, computer science, and robotics to forge new futures for human-robot relations. Dr. Gannon is a Knight Foundation Awardee, a World Economic Forum Cultural Leader, and a former Robotics & AI Researcher at NVIDIA. She has held previous fellowships at ETH Zurich, Autodesk Pier 9, and the Carnegie Mellon STUDIO for Creative Inquiry. She is known as one of the 'Top 10 Women in Robotics Industry' and 'World's 50 Most Renowned Women in Robotics' according to Analytics Insight. Gannon holds a Masters of Architecture from Florida International University and a Ph.D in Computational Design from Carnegie Mellon University.

PROFESSIONAL

2023 – *present*	**Editorial Board, Journal on Construction Robotics**
2012 – *present*	**Founder & Principal Researcher, ATONATON** ATONATON is a research studio inventing better ways to communicate with machines. As founder and principal researcher, I lead development on our commissioned, sponsored, and academic research.
2018 – 2023	**Robotics & AI Research Engineer, NVIDIA** Developing Robotics Simulation, Human-Robot Interaction, Virtual Production, and Metaverse tools for the NVIDIA Omniverse platform.
2021 – *present*	**Affiliate Faculty, Florida International University** Honorary faculty position in FIU School of Architecture
2014 – 2021	**Research Fellow, Carnegie Mellon STUDIO for Creative Inquiry**
2018 – 2019	**Council Member, World Economic Forum Council on IoT, Robotics, & Smart Cities** As a council member, I advised WEF on governance and policy frameworks for inclusive robotics.
2015 & 2016	**Artist in Residence, Autodesk** Invited residencies to develop my interactive installations, Quipt and Mimus.
2014 & 2015	**Research Fellowship, Autodesk** Ph.D Researcher in the User Interface Group at Autodesk Research, where I developed Tactum and Exoskin.
2012 – 2014	**Adjunct Faculty, Carnegie Mellon University**

EDUCATION

2018	**PhD of Computational Design, Carnegie Mellon University** Dissertation: Embodied Interfaces for Autonomous Fabrication Machines
2012	**Masters of Computational Design, Carnegie Mellon University**
2010	**Master of Architecture, Florida International University** AIA Bronze Medal for Academic Excellence
2008	**Bachelors of Architecture, Florida International University**

PATENTS

P.02

Techniques for on-body fabrication of wearable objects
Madeline Gannon, Tovi Grossman, George Fitzmaurice. Filed: 2017-01-13. Patent No. US-2017204541-A1.

P.01

Skin-based approach to virtual modeling
Madeline Gannon,Tovi Grossman, George Fitzmaurice. Filed: 2019-07-12. Granted: 2021-11-02. US Patent No.11,163,158. https://uspto.report/patent/grant/11,163,158

HONORS

2022

Knight Foundation New Work Award

2018 & 2019

World Economic Forum Cultural Leader
Cultural Leaders advise the Forum on how arts and culture can vitalize the health of societies.

2018

Innovative Research Award of Excellence, ACADIA

2017

Ars Electronica STARTS Prize, Honorary Mention

2004 – 2008

NCAA Division I Athlete
4-year Starter, 2-year Captain of Division I Women's Soccer Team, Florida International University.

PUBLICATIONS

Conference Papers
Fully Refereed

Madeline Gannon, Tovi Grossman, and George Fitzmaurice. 2016. ExoSkin: On-Body Fabrication. In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '16). ACM, New York, NY, USA.

Madeline Gannon, Tovi Grossman, and George Fitzmaurice. 2015. Tactum: A skin-centric approach to digital design and fabrication. In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '15). ACM, New York, NY, USA. CHI 2015
BEST PAPER HONORABLE MENTION

Gannon, M. (2014) Reverberating Across the Divide: Bridging virtual and physical contexts in digital design and fabrication. In ACADIA 14: Design Agency. In Proceedings of the 34th Annual Conference of the Association for Computer Aided Design in Architecture (ACADIA) Los Angeles, USA: 357-364.

Bard, J.; **Gannon, M**.; Jacobson-Weaver, Z.; Jeffers, M.; Smith, B.; Contreras, M. (2014) Seeing is Doing: Synthetic Tools for Robotically Augmented Fabrication in High-Skill Domains. In ACADIA 14: Design Agency. In Proceedings of the 34th Annual Conference of the Association for Computer Aided Design in Architecture (ACADIA) Los Angeles, USA: 409-416.

Melendez, F.; **Gannon, M**.; Jacobson-Weaver, Z.; Toulkeridou, V. (2014) Adaptive Pneumatic Frameworks. In ACADIA 14: Design Agency. In Proceedings of the 34th Annual Conference of the Association for Computer Aided Design in Architecture (ACADIA) Los Angeles, USA: 426-434.

Schwartz, Thibult, Joshua Bard, **Madeline Gannon**, Zack Jacobson-Weaver, Michael Jeffers, Richard Tursky. "All Bent Out ... Adaptive wood bending using

coordinated robotic control." In Proceedings of Robotic Fabrication in Architecture, Art, and Design. Springer Press, Berlin, 2014.

Gannon, M. and Brockmeyer, E. Teaching CAD/CAM Workflows to Nascent Designers. In Rethinking Comprehensive Design: Speculative Counterculture: In Proceedings of the 19th International Conference on Computer-Aided Architectural Design in Asia. Kyoto, JP: The Association for Computer-Aided Architectural Design in Asia, 2014. 801–810.

Book Chapters & Interviews

Gannon, M. 2018. Human-Centered Interfaces for Autonomous Fabrication Machines (Doctoral Dissertation). Carnegie Mellon University. PDF

Domestic Dystopia? The Future of the Smart Home. Apartamento Magazine. Issue 20, Autumn/Winter 2017-18. LINK

Gannon, M. 2017. The Shape of Touch: On-Body Interfaces for Digital Design and Fabrication. Architectural Design, 87:6. 114–119. doi:10.1002/ad.2246

Gannon, M. 2016. Mimus: Coming Face-to-Face With Our Companion Species. In "Fear And Love: Reactions to a Complex World". McGuirk, J., and Herrero, G, (eds.) Phaidon Press, Ltd. London, UK.

Gannon, M. 2016. Open Source Tools for Creative Robotics. In "Openism: Conversations on Open Hardware". Newman, A., Tarasiewicz, M., Wagner, S.C., Wuschitz, S. (eds.) University of Applied Arts Vienna. Vienna, Austria.

Guler, S.D., **Gannon, M.**, Sicchio, K. 2016. "Crafting Wearables: Blending Technology with Fashion". Apress Media. California.

Gannon, M. 2013. After Fifty Years of Computer-Aided Design. In "[En]Coding Architecture: the Book". Liss Werner (ed.) CMU School of Architecture Press, Pittsburgh, US. 16–21.

Extended Abstracts & Workshops
Non-Refereed

Stefanie Mueller, Laura Devendorf, Stelian Coros, Yoichi Ochiai, **Madeline Gannon**, and Patrick Baudisch. 2016. CrossFAB: Bridging the Gap between Personal Fabrication Research in HCI, Computer Graphics, Robotics, Art, Architecture, and Material Science. In Proceedings of the 2016 CHI Conference Extended Abstracts on Human Factors in Computing Systems (CHI EA '16). ACM, New York, NY, USA.

Dan Moore and **Madeline Gannon**. ofxRobotArm: Democratizing Robotic Control for the Arts. 2021. Workshop on Robotics x Arts. Robotics: Science and Systems (RSS '21).

EXHIBITIONS

2021

Vers un imaginaire numérique: Designing the Computational Image
Centre de design de l'UQAM. Montreal, CA.

2019 – 2021

Drawing Codes: Experimental Protocols of Architectural Representation, Volume II
Arthur A. Houghton, Jr. Gallery, The Cooper Union / Irwin S. Chanin School of Architecture, New York

	Elmaleh Gallery, University of Virginia School of Architecture, Charlottesville Korach Gallery, University of Miami School of Architecture, Miami Gould Gallery, University of Washington College of Built Environments, Seattle Hubbell Street Galleries, California College of the Arts, San Francisco
2019	**Intersections: STUDIO for Creative Inquiry 30th Anniversary Exhibition** ICA Miller. Pittsburgh, US.
2016 – 2017	**FEAR AND LOVE: Reactions to a Complex World** The Design Museum. London, UK. LINK
2015	**The Engaged Body** The Design Museum Boston. Boston, US.
2014	**3D Printshow: New York Fashion Week** New York, US.

INVITED TALKS

New Frontiers in Human-Robot Relations
Digital Matters: Digital Materiality Symposium. **ETH Zurich**. Zurich, CH. May 2022.

Keynote: Robots Are Creatures, Not Things.
UC Berkeley, Arts, Technology, and Culture Colloquium. Berkeley, CA, september 2019

Masterclass: The Future of Humans and Machines: Human-Robot Interaction across the arts, sciences, and society. **SONAR+D**. Barcelona, ES. July 2019.

Keynote: Breathing Life into Architectural Robotics
Institute of Technology in Architecture, **ETH Zurich**. Zurich, CH, May 2019

Keynote: Breathing Life into Architectural Robotics
Georgia Tech School of Architecture. Atlanta, GA. April 2019

Keynote: Robots Are Creatures, Not Things
Brown University. Humanity Centered Robotics Initiative (HCRI). Providence, RI. February 2019.

Robots Are Creatures, Not Things
World Economic Forum Annual Meeting. Davos, CH. Jan. 2019.

Main Stage Keynote
ABB Customer World China. Xiamen, CN. November 2018.

Keynote: Innovative Research Award
ACADIA. Mexico City, MX. October 2018.

Interview: A Bot You Can Trust
NPR / Science Friday. Pittsburgh, PA. May 2018.

Keynote: New Frontiers in Human-Machine Relations.
The Next Web. Amsterdam, NL. May 2018.

Keynote: Becoming a Robot Whisperer
BetaZone: New Frontiers in Creativity. **World Economic Forum** Summer Davos. Tianjin, CN. 2018.

Keynote: Robots Are Creatures, Not Things
Google SPAN. Pittsburgh, PA, September 2017

Lifelong Learning Through Creativity and Play
World Economic Forum Summer Davos. Dalian, China, June 2017

On-Body 3D Modeling & Fabrication
3D Printing Summit. Carnegie Mellon University. Pittsburgh, PA, January 2017

Becoming a Robot Whisperer
WIRED 2016: Next Generation, London, UK, November 2016

How to Tame Your Robot: Open Source Tools for Creative Robotics
Open Hardware Summit Europe. Vienna, Austria, May 2016

The Body as a Canvas for Digital Design
Body Architectures Symposium. Miami, FL, February 2016

Making the Future of Making
California College of the Arts. San Francisco, CA, November 2015

Opening Industrial Robotics
Open Hardware Summit. Rome, Italy, September 2015

The Shape of Touch: On-Body Digital Design for 3D Printed Wearables
SXSW. Austin, TX, March 2015

Merging Digital & Physical Processes in Digital Design and Fabrication
RAPID: 3D Printing + Additive Manufacturing. Pittsburgh, PA, June 2013.

SELECTED PRESS

Robots should be "good neighbours and good citizens" says Madeline Gannon. Dezeen, 07.21.2023

Video Friday: Googly Eye — Your weekly selection of awesome robot videos. IEEE Spectrum, 04.23.2023

Slanted Magazine #37 — Artificial Intelligence. Slanted Magazine, 05.01.2021

How Choreography Can Help Robots Come Alive. Wired, 02.07.2021

World's 50 Most Renowned Women in Robotics. Analytics Insight, 06.24.2020

Top 10 Women in Robotics Industry. Analytics Insight, 02.23.2020

30 women in robotics you need to know about. RoboHub, 10.08.2019

Should We Think of Robots As Living Creatures Not Things? Interesting Engineering, 05.10.2019

Here's what's cooking inside Nvidia's new AI robotics research lab in Seattle GeekWire, 01.11.2019

Madeline Gannon's "quirky" robots move together like a pack of animals. Dezeen, 12.05.2018

'Robot whisperer' teaching droids to be 'cheeky' in effort to make machines show emotions. **Evening Standard**, 11.30.2018

Meet the Roboticist Making Machines Act Like Animals. **Discover Magazine**, 11.21.2018

Teaching robots body language offers common ground for humans and machines. **The Verge**, 11.11.2018

A Bot You Can Trust (NPR Science Friday Interview). **Science Friday**, 05.25.2018

How to Avoid a Robot Apocalypse. Dezeen, 05.18.2017

Meet the Robot Whisperer who sees robots as creatures not things. 52 Insights, 04.16.2017

The Robot Tamer. **Slate**, 03.28.2017

Inside London's Design Museum. Inside Out London, BBC One. Aired 01.30.2017

Teaching Robots to Be More Than Simple Servants. **Discover Magazine**, 1.21.2016

Industrial Robot Reprogrammed To Get Bored And Curious Like A Living Thing. Vice: The Creators Project. 01.5.2017

Review: Fear And Love. **Icon Magazine**, printed January 2017

What Happens to Industrial Robots when they Retire?. Swipe, **Sky News**. Aired 12.15.2016

Design in Anxious Times. **Metropolis Magazine**, printed December 2016.

Can Design Change the World? **The Telegraph**.12.05.2016

Fear and love: the Design Museum taps a fractious design landscape. **Wallpaper***. 11.18.2016

Fear And Love Review – Grindr And A Brexit Living Room Light Up Design Museum Launch Show. The Guardian. 11.17.2016

Fear And Love, Design Museum, London — 'Big Questions'. FT. 11.17.2016

Design Museum's Opening Exhibition Presents Reactions To A Complex World. Dezeen. 11.17.2016

This One Ton Robot Was Created To Ease Your Fears Of A Robot Takeover. **Vice: Motherboard**.11.15.2016

The Robot Whisperer Who Tames Giant Industrial Machine 'Monsters' To Do Her Bidding. **Wired UK**. 11.11.2016

Meet the robot whisperer who trains "big, monstrous, industrial robots" to follow her every command: This definitely isn't terrifying at all. Digital Spy. 11.05.2016

Researcher created a way to print jewelry right on your body. Business Insider, 05.22.2016

Madeline Gannon Is The Robot Whisperer. **Discover Magazine**.12.22.2015

Madeline The Robot Tamer! Hackaday. 12.20.2015

Watch A Robot Tamer Control Industrial Machines With Simple Gestures. Gizmodo. 12.19.2015

Researcher Trains Giant Robot To Sit, Stay, And Beg. Vice: The Creators Project.12.17.2015

Quipt – Teaching Industrial Robots Spatial Behaviours For Human Interaction. Creative Applications. 12.17.2015

Design 3d-Printed Wearables By Pinching And Poking On-Skin Projections. PSFK. 11.04.2015

The Scientist Who Is Making 3d Printing More Human: Madeline Gannon Wants To Unlock The Designer In All Of Us. **Popular Science**. 09.09.2015

On-The-Body Design Method For 3d Printed Wearables. 3d Printing Industry. 06.26.2015

Augment Your Arm: Designing 3d Printed Wearables On Your Skin. Leap Motion. 06.20.2015

Design 3d Printed Accessories Using Your Arm As The Interface. **Fast Company**. 06.08.2015

Manipulated Light Projections Become 3d-Printed Jewellery With Tactum. Dezeen. 06.04.2015

12 Fascinating Projects From The Bleeding Edge Of Interaction Design. Gizmodo. 04.28.2015

Nightmare Bracelets Created With A New 3d Printing Design Method. Vice: The Creators Project. 04.10.2015

What If We Could Design Wearables Right On Our Skin? **Wired**. 03.27.15

Madlab Creates Beautiful 3d-Printed Fashion Accessories Using Creepy Virtual Squids. **Complex**. 02.14.2014

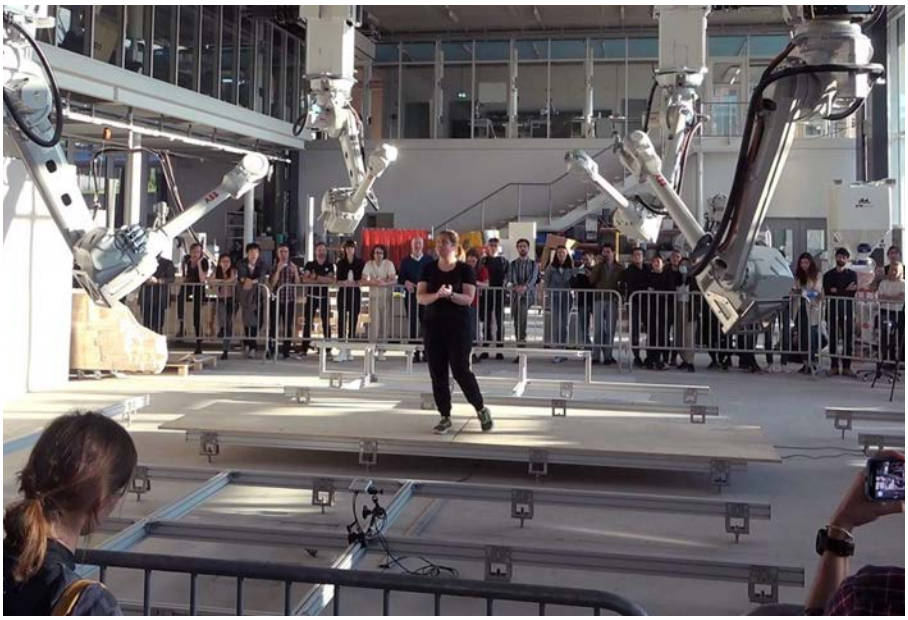
Madlab Brings Virtual Creatures Into The Physical World As Fashion Accessories. The Creators Project. 02.13.2014

These Intricate Collars Look Like Fish Bones, Are Actually 3d-Printed. Gizmodo. 01.23.2014

REFERENCES *Available upon request*

SELECTED WORK Full Details: WWW.ATONATON.COM

ROBOT TAMING SERIES

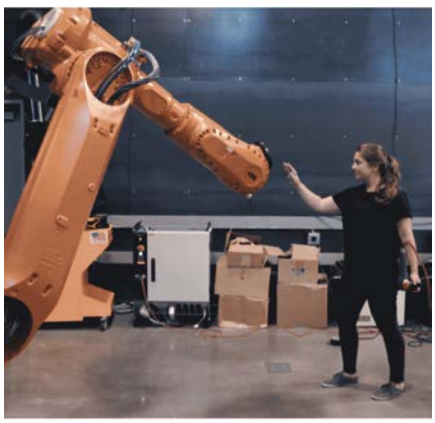


Other Natures is a performance where industrial robots behave more like a flock of swans than automation infrastructure. The performer uses body and hand gestures to beckon the robots closer or shoo them away.

Date	2022
Location	Zurich, CH
Materials	4 ABB Industrial robots, depth sensors, custom software
Sponsors	NVIDIA, ETH Zurich
Project Page	atonaton.com/other-natures

Manus is a set of 10 industrial robots that are programmed to behave like a pack of animals. We designed the enclosure, built custom software, customized the sensor hardware to bring this large scale, immersive installation to life.

Mimus is a giant industrial robot that is curious about the world around her. She senses and moves to engage with visitors, but her attention span is limited: stay still too long and she will get bored and go seek someone else to play with.

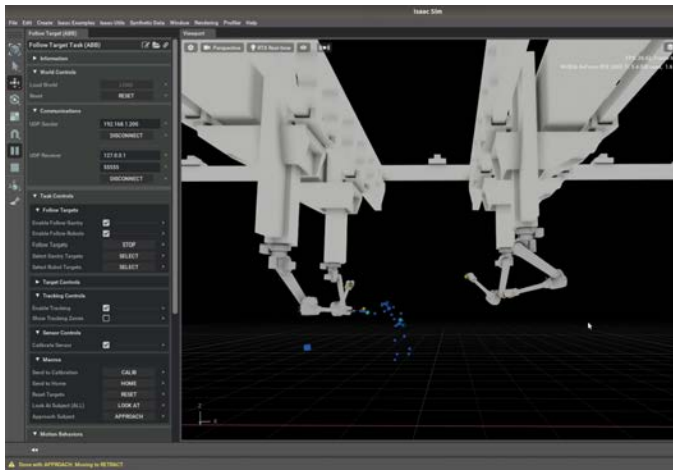


Quipt is a gesture-based control software that facilitates new, more intuitive ways to communicate with industrial robots. It uses wearable markers and a motion capture system to connect spatial behaviors for interacting closely with the robot.

Date	2018	Date	2016 — 2017	Date	2015
Location	Tianjin, China	Location	London, UK	Location	San Francisco, US
Project Type	Interactive Installation	Project Type	Interactive Installation	Project Type	R&D, Software
Materials	10 ABB Industrial robots, 12 depth sensors, custom software	Materials	ABB Industrial Robot, 12 depth sensors, custom software	Materials	ABB Industrial Robot, Vicon tracking system, 3d printed wearables, custom software
Sponsors	World Economic Forum, ABB	Sponsors	Design Museum London, ABB	Sponsors	Autodesk
Project Page	atonaton.com/manus	Project Page	atonaton.com/mimus	Project Page	atonaton.com/quipt

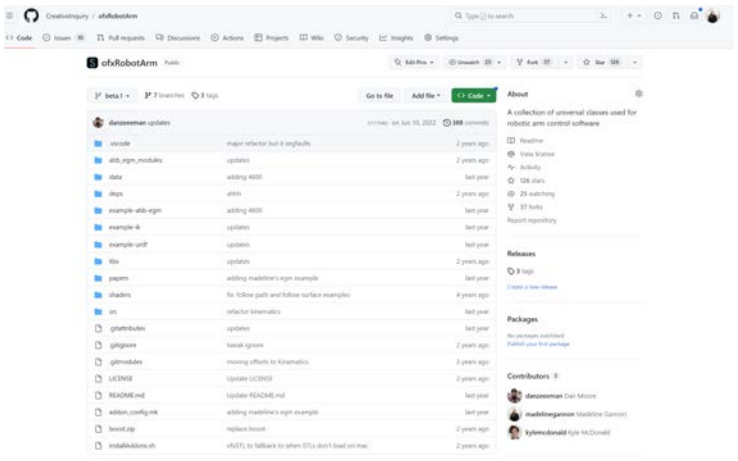
---

ROBOTIC SIMULATION SOFTWARE



While at NVIDIA, I helped develop *Omniverse Isaac Sim*, a robotic simulation software built on top of NVIDIA's metaverse platform. I developed custom tools and interfaces that bridged sim-to-real workflows and supported more intuitive human-robot interaction.

Date	2018 — 2023
Project Type	R&D and Research Transfer
Client	NVIDIA
Project Page	developer.nvidia.com/isaac-sim



ofxRobotArm is an openFrameworks addon for doing creative things with robot arms. This tool strives to remove as many technical barriers as possible, and includes many examples for simulating and controlling robots in real-time: including direct manipulation, geometry-based manipulation, motion capture-based interactions, and keyframe animation.

Date	2016 — 2021
Project Type	Open Source Tool Development, R&D
Collaborators	Dan Moore, Kyle McDonald
Project Page	github.com/CreativeInquiry/ofxRobotArm

Tactum is an augmented modeling tool that lets you design 3D printed wearables directly on your body. It uses depth sensing and projection mapping to detect and display touch gestures on the skin. Just touch, poke, rub, or pinch the geometry projected onto your arm to customize ready-to-print, ready-to-wear forms.

Date	2015
Project Type	R&D
Sponsor	Autodesk
Project Page	atonaton.com/tactum

Reverb is a context-aware 3D modeling environment that lets you design ready-to-print wearables around your own body. Reverb uses techniques in computer vision, digital design, and digital fabrication to translate your real-world hand gestures into intricate geometry that can be immediately printed and worn on the body.

Date	2014
Project Type	R&D
Sponsor	STUDIO for Creative Inquiry
Project Page	atonaton.com/reverb