

ROBERT TWOMEY

CURRICULUM VITAE

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EDUCATION

- 2018 Ph.D., Digital Arts and Experimental Media, University of Washington, Seattle, WA
Dissertation: "Machines for Living." Smart home technologies to study intimate life.
- 2007 M.F.A., Visual Arts, University of California, San Diego, La Jolla, CA
- 2001 B.S., majors in Art and Biomedical Engineering, Yale University, New Haven, CT

ACADEMIC APPOINTMENTS

- 2019- Lecturer, Visual Arts Department, University of California, San Diego, La Jolla, CA
- 2019- Lecturer, Data Science Program, University of California, San Diego, La Jolla, CA
- 2019- Lecturer, Electrical and Computer Engineering, University of California, San Diego, La Jolla, CA
- 2018- Postdoctoral Scholar, Arthur C. Clarke Center for Human Imagination, University of California, San Diego, La Jolla, CA
- 2016-18 Assistant Professor, Digital Media, Department of Art, Youngstown State University, Youngstown, OH
- 2015-16 Postdoctoral Researcher, Center for Digital Arts and Experimental Media, University of Washington, Seattle, WA
- 2011-15 Instructor, Center for Digital Arts and Experimental Media, University of Washington, Seattle, WA
- 2008-10 Lecturer, Visual Arts Department, University of California, San Diego, La Jolla, CA

TEACHING EXPERIENCE

Visual Arts Department, University of California, San Diego

- 2020- Interdisciplinary Computing and the Arts (ICAM) Senior Project seminar

Electrical and Computer Engineering, University of California, San Diego

- 2019 Machine Learning for the Arts*

Data Science Undergraduate Program, University of California, San Diego

- 2019 Programming and Basic Data Structures for Data Science
- 2019 Principles of Data Science

Department of Art, Youngstown State University

- 2017-18 Seminar on Interdisciplinary Theory (graduate seminar)*
- 2017-18 Special Topics: 3D Printing and Digital Fabrication*
- 2016-17 Introduction to Digital Media*
- 2017 Foundations of 3D Design

Center for Digital Arts and Experimental Media, University of Washington

- 2015 Introduction to Computer Vision for Digital Art*
- 2013 Embedded Systems*
- 2011-13 Sensing and Control Systems for Digital Art*
- 2012 Film Production
- 2011 Mechatronic Art, Design, and Fabrication I
- 2011 Performance Art Reading Group (graduate seminar)*

- 2010-14 Mechatronic Art, Design, and Fabrication I (teaching assistant)
- 2011-14 Mechatronic Art, Design, and Fabrication II (teaching assistant)
- 2011-13 Mechatronic Art, Design, and Fabrication III (teaching assistant)

Visual Arts Department, University of California, San Diego

- 2010 Time and Process Based Digital Media II*
- 2010 Electronic Technologies for Art*
- 2008-09 Electronic Technologies for Art II*

- 2007-08 Electronic Technologies for Art (teaching assistant, instructor of record)
- 2006 Introduction to Computing and the Arts (teaching assistant, instructor of record)
- 2006 Introduction to Art-making: 3d (teaching assistant, instructor of record)
- 2005 Computer Programming for the Arts (teaching assistant)

*self-designed courses

PROFESSIONAL EXPERIENCE

- 2018 Resident Artist, Arthur C. Clarke Center for Human Imagination, University of California, San Diego, La Jolla, CA
- 2017-18 Artist in Residence, STUDIO for Creative Inquiry, Carnegie Mellon University, Pittsburgh, OH
- 2016-18 Lead Faculty, Launch Lab, Youngstown State University, Youngstown, OH (website)
- 2014-15 Consultant, control system design and programming for large-scale mechatronic installation, "the common S E N S E" at the Henry Art Gallery, Seattle, WA, Artist: Ann Hamilton (website)
- 2014-15 Graduate Research Assistant, Digital Arts and Experimental Media, University of Washington, Seattle, WA, PI: Juan Pampin
- 2013-14 Consultant, circuit design and programming for consumer ambient information display product, Seattle, WA, Client: OrbNEXT (website)
- 2012 Consultant, design and programming for public interactive light installation at King Street Station, Seattle, WA, Client: ReBAR, San Francisco
- 2007-10 Programmer / Analyst II for the Experimental Game Lab, UC San Diego, La Jolla, CA. PI: Sheldon Brown
- 2004-06 Graduate Research Assistant, Experimental Design Lab, NYC and UC San Diego, La Jolla, CA. PI: Natalie Jeremijenko
- 2002-04 Research Assistant, Center for the Study of Learning, Georgetown University, Washington, DC. PI: Dr. Guinevere Eden

AWARDS & GRANTS

- 2019 Co-PI, "Building Contextual Presence to Augment Collaborative Work at the Network Edge", NSF Future of Work at the Human-Technology Frontier (**\$1.5M**, under review)
- 2019 Co-PI, "A Multi-modal Study of Empathy and Engagement in an Art Museum Context", California Arts Council (**\$40k**)

- 2019 Faculty Mentor, Yixin Chen, “ML + Photography Project”, Halicioglu Data Science Institute Undergraduate Research Scholarship (**\$2k**, \$500 for mentor)
- 2019 Faculty Mentor, Esther Wang, “Plant Visualization Project”, Halicioglu Data Science Institute Undergraduate Research Scholarship (**\$2k**, \$500 for mentor)
- 2018 Strategic Investment Funding for “Immersive Visualization and Collaborative Work”, Youngstown State University, Youngstown, OH (**\$90k**)
- 2018 University Research Council Grant, Youngstown State University, Youngstown, OH (**\$5k**)
- 2018 Research Professorship, Youngstown State University, Youngstown, OH
- 2017 **Best Paper**, SIGGRAPH 2017 Art Papers, Los Angeles, CA
- 2017 Summer Faculty Innovation Grant, Youngstown State University, Youngstown, OH (**\$2.5k**)
- 2017 NVIDIA Hardware Grant for “Light Field Imaging and Machine Learning” (**\$1.2k**)
- 2016 Amazon Web Services Cloud Credits for Research for “Light Field Imaging and Machine Learning”(**\$1k**)
- 2015 Artist Stipend, Gallery 4Culture, Seattle, WA
- 2010-15 Pre-Doctoral Teaching Scholarship, Center for Digital Arts and Experimental Media, University of Washington, Seattle, WA
- 2010-15 Research Fellowship, Center for Digital Arts and Experimental Media, University of Washington, Seattle, WA
- 2013 Visiting Artist and Travel Grant, Universidad Nacional de Tres de Febrero, Buenos Aires, C.A., Argentina
- 2007 Humanities Center Grant, University of California, San Diego, La Jolla, CA
- 2006 Russell Foundation Grant, University of California, San Diego, La Jolla, CA
- 2005 First Year Artist Prize, Visual Arts Department, University of California, San Diego, La Jolla, CA
- 2004 Residency and Grant, Vermont Studio Center, Johnson, VT
- 2000 Sudler Fund for the Creative and Performing Arts Grant, Yale University, New Haven, CT
- 1999 Sudler Fund for the Creative and Performing Arts Grant, Yale University, New Haven, CT

EXHIBITIONS

- 2019 Quantified Self: Project Amelia, Pittsburgh, PA
- 2019 Rover at “Ecologies of Transformation”, ACM Designing Interactive Systems / Cognition and Creativity, San Diego, CA
- 2019 A Machine for Living In at “Ecologies of Transformation”, ACM Designing Interactive Systems / Cognition and Creativity, San Diego, CA
- 2018 Athens Digital Arts Festival 2018, Athens, Greece
- 2018 Rendering (the) Visible III: Liquidity, Georgia State University, Atlanta, GA
- 2018 Immersion, McDonough Museum of Art, Youngstown, OH
- 2017 A Machine For Living In, Foster Art Gallery, Westminster College, New Wilmington, PA (solo)
- 2017 Creating Computational Creativity, Visual Arts Gallery, University of California, San Diego, San Diego, CA
- 2016 Via Festival, Pittsburgh, PA (collaboration with Dana Sperry)
- 2015 The Serious Business of Children, Gallery 4Culture, Seattle, WA (solo)
- 2015 Rover, Black Box 2.0, Seattle, WA (collaboration with Mike McCrea)
- 2015 ...that language is shaped air..., Henry Art Gallery, Seattle, WA, March 20 (programming and performance with Juan Pampin and Seattle Chamber Players)
- 2014 Convex Mirror at ‘The Big Draw,’ Burke Museum, Seattle WA, October 4
- 2014 Convex Mirror, Storefronts Seattle, Seattle, WA (solo)
- 2014 Meany Hall for the Performing Arts, Seattle, WA
- 2013 SIGGRAPH Art Gallery 2013, Anaheim, CA (catalog)
- 2012 Push Arts Festival, Seattle, WA
- 2011 Embedding Absence, Jacob Lawrence Gallery, University of Washington, Seattle, WA
- 2010 Here Not There, Museum of Contemporary Art San Diego, La Jolla, CA
- 2010 and the world is ours..., Compact Space, Los Angeles, CA (two-person)
- 2009 Social Climbing, Luis De Jesus Seminal Projects, San Diego, CA

- 2009 Heavy Weight, The Body Firm, Pasadena, CA
2009 Natural Language, Four Walls Gallery, San Diego, CA (solo)
2009 World Picture Machine, Oceanside Museum of Art, Oceanside, CA (solo)
2008 Natural Love, Sixteen:One Gallery, Santa Monica, CA
2008 Inside the Wave: Six San Diego / Tijuana Artists Construct Social Art, with Particle Group, San Diego Museum of Art, San Diego, CA
2008 COCKED! The Possessed Male: Object of Desire, Luis De Jesus Seminal Projects, San Diego, CA
2007 Seven Segment Display, Gallery@CalIT2, La Jolla, CA (solo) (catalog)
2007 Compass 2007: New Art from the University of California's MFA Programs, Sweeney Art Gallery and California Museum of Photography, Riverside, CA (catalog)
2007 MFA07, University Art Gallery, University of California, San Diego, La Jolla, CA (catalog)
2007 Smash and Tickle, Sixteen:One Gallery, Santa Monica, CA
2007 Origin is the Goal, Los Angeles Contemporary Exhibitions, Los Angeles, CA
2006 Where, Sun Down Salon, Los Angeles, CA (performance)
2006 Father-Daughter Art Show, Marcuse Gallery, University of California, San Diego, La Jolla, CA (solo)
2006 How Stuff Is Made, with xDesign Lab, International Society of Electronic Arts 2006, San Jose, CA
2005 Community Built Display, part of Adriene Jenik's Specific 1.0, CalIT2, La Jolla, CA
2005 Fresh: New Art from the University of California, San Diego, Museum of Contemporary Art San Diego, San Diego, CA
2005 AxS: At the Intersection of Art and Technology, with xDesign Lab, Armory Center for the Arts, Pasadena, CA, (dvd catalog)
2005 Que Traes, Estación Tijuana, Tijuana, BC, Mexico
2005 Outer Space, Sixth College, La Jolla, CA
2001 Senior Show, Yale School of Art Gallery, New Haven, CT
1999 Art Class, Salon Q, Tucson, AZ (solo)

BIBLIOGRAPHY

- 2019 "Making Art with AI", This Week @ UC San Diego, June 13 (online)
2017 "Behind the Research: Light Field Imaging with Robert Twomey," ACM SIGGRAPH Blog, October 17 (online)
2017 "Making Art With Smart Tech - A Machine For Living In Exhibit at WC," WCN247, August 25 (online)
2017 "SIGGRAPH Wrap-Up: Machine Learning, Better VR and Brain-Controlled Gaming", Studio Daily, August 10, 2017. (online)
2015 "The Serious Business of Children", The Seattle Times, October 18 (print and online)
2015 "Robert Twomey: the Serious Business of Children", The Stranger, October (online)
2015 Luke Sturgeon, "Data-Fictions: Data and its interface as a cultural artefact", MA Design Interactions, Royal College of Art
2015 "Artist Robert Twomey explores the intersection of humans and machines", Microsoft News Center, June 18 (online)
2015 Joe Milutis, "Bright arrogance, gallery C: Speed, Erotics, Emergence", Jacket 2, June 24 (online)
2014 Jen Graves, "What Only Artists Can Teach Us About Technology, Data, and Surveillance", The Stranger, December 10 (print, online)
2014 Michael Upchurch, "The UW mixes art and science with worldwide talent", The Seattle Times, March 21 (print, online)
2014 DiVA "Digital, Interactive and Visual Arts", Journal of the Society for Art and Science, Vol. 35 Winter 2014 (print, online)
2010 Jennifer Li, "A Show of Their Own", venuszine.com, February 17 (online)
2009 "Breaking Language Barriers", San Diego City Beat, March 10 (online)

- 2007 Stephen Hepworth, "MFA07 @ The Egyptian" (printed catalog)
- 2007 Tyler Stallings and Ciara Ennis, "Compass 2007" (printed catalog)
- 2005 AxS: At the Intersection of Art and Science (dvd catalog) (video interview)
- 1999 "Art Class," exhibition announcement, Tucson Weekly, June 24 (print, online)

PUBLICATIONS

- 2019 "Rover: Mechanic Explorations of Domestic Space," C&C 19, Proceedings of the 2019 ACM Conference on Creativity and Cognition, New York, NY (article)
- 2019 "A Machine for Living In: Ubiquitous Sensing to Explore the Home as a Site of Intimate Life," C&C 19, Proceedings of the 2019 ACM Conference on Creativity and Cognition, New York, NY (article)
- 2018 "Machines for Living," Ph.D. diss., University of Washington, Seattle, WA ([dissertation](#))
- 2017 "Transforming the Commonplace Through Machine Perception: Light Field Imaging and Audio Feature Extraction in the Rover Project," SIGGRAPH 2017, Los Angeles, CA (**Best Paper Award**) (paper)
- 2013 "Drawing Machine," Leonardo Journal, Volume 46, Issue 4, 2013 (article)
- 2009 "Not Me: Collaboration and Co-production with Language Processing Systems," Proceedings of the Digital Arts and Culture Conference, 2009, Irvine, CA (paper)
- 2008 "Seven Segment Display," Masters Thesis, University of California, San Diego, La Jolla, CA (book)

INVITED TALKS AND WORKSHOPS

- 2019 "Machines for Living: Le Corbusier, Smart Home Utopianism, and the Myth of Utility," 33rd Meeting of the Society for Literature, Science, and the Arts (SLSA), Irvine, CA, November 7-10 (talk)
- 2019 "Text Generation with RNNs," UCSD Digital Humanities Research Group, UCSD Geisel Library (workshop)
- 2019 "Machine Learning for the Arts Bootcamp," Qualcomm Conference Center, UC San Diego, March 21 (workshop)
- 2019 "Digital Mythologies: Abstractions and Automations," College Art Association Annual Meeting, New York, NY (talk, panel)
- 2018 "A.I., Creativity and Trust," Seattle Design Festival, Seattle, WA, September 20 (talk, panel)
- 2018 "Machines for Living," University of California, San Diego, La Jolla, CA, May 24 (talk)
- 2018 "Machines for Living," Lewis and Clark College, Portland, OR, March 12 (talk and workshop)
- 2018 "Machines for Living," Santa Clara University, Santa Clara, CA, February 26 (talk and workshop)
- 2017 "Art and Technology at YSU," YSU Board of Trustees, Youngstown, OH (talk)
- 2017 "Machines for Living: Reading and Writing Inhabited Space," Electronic Media Studio, Carnegie Mellon University, Pittsburgh, PA, November 3 (talk and workshop)
- 2017 "Machine as Metaphor," Colloquium Speaker, Department of Computer Science and Information Systems, Youngstown State University, Youngstown, OH, August 27 (talk)
- 2017 "Transforming the Commonplace Through Machine Perception: Light Field Imaging and Audio Feature Extraction in the Rover Project," SIGGRAPH 2017 (talk)
- 2017 University of California, San Diego, March 13-14 (talk and graduate critiques)
- 2016-17 "YSU3DP," Youngstown State University, Youngstown, OH, Aug - Dec (workshop series)
- 2016 Virginia Polytechnic Institute, Blacksburg, VA, April 24 (talk)
- 2016 Molecular Shadows Salon, Seattle, WA, March 29 (talk, seminar)
- 2016 Youngstown State University, Youngstown, OH, Feb 24 (talk)
- 2015 Presentation to 4Culture Public Art Advisory Council, Gallery 4Culture, Seattle, WA, Oct 14. (talk)
- 2015 "Robots," Creative Mornings Seattle, Seattle Museum of Art, Seattle, WA, May 8 (talk)
- 2015 "Scoring the Bullroarers," Henry Art Gallery, Seattle, WA, March 7 (talk, workshop)

- 2014 Convex Mirror at 'The Big Draw,' Burke Museum, Seattle WA, October 4 (presentation)
- 2014 "Crafting Code," Seattle Art + Tech Meetup, Seattle, WA, September 29 (talk, panel)
- 2014 "Art + Science = DXARTS," UW College of Arts & Sciences Video Series, June 5 (video interview)
- 2014 UW Dean's Club Event, Burke Museum, Seattle WA, June 4 (presentation)
- 2014 Stevens Institute of Technology, Hoboken, NJ, April 3 (talk)
- 2013 Universidad Nacional de Tres de Febrero, Buenos Aires, C.A., Argentina, September 10 (talk)
- 2013 "Speech Technologies," Universidad Nacional de Tres de Febrero, Buenos Aires, C.A., Argentina, September 21 (masters student workshop)
- 2012 Digital Culture(s) course, Highline Community College, Des Moines, WA, February 4 (talk)
- 2009 Digital Arts and Culture Conference, Irvine, CA, December 14 (paper and talk)
- 2007 "Procedural Subjectivity," Undergraduate Media Arts Organization, University of California, San Diego, La Jolla, CA (talk)
- 2005 "Feral Robotic Dogs," with xDesign lab, O'Reilly E-Tech Conference, San Diego, CA (workshop)

PROFESSIONAL SERVICE

- 2019 Co-Organizer, Cultured Data: HDSI Data Science and the Arts and Humanities Symposium, Winter 2020, San Diego, CA
- 2019 Reviewer, SIGGRAPH 2019 Art Papers, Anaheim, CA
- 2018 Curator, Relay Relay gallery, Youngstown, Ohio
- 2018 Juror, SIGGRAPH 2018 Art Papers, Vancouver, BC
- 2017 Curator, FACE by Eunsu Kang, Judith Rae Solomon Gallery, Youngstown, OH
- 2017-18 Steering Committee, Ohio Youth Entrepreneurship Program (\$500k state grant)
- 2016 Reviewer, SIGGRAPH 2016 Art Papers, Anaheim, CA

ACADEMIC SERVICE

- 2019 Mentor, Halicioglu Data Science Institute Undergraduate Research Scholarships, UC San Diego
- 2017-18 Core Faculty, Interdisciplinary Game Studies Program Development, Youngstown State University
- 2017-18 Founding Instructor, Interdisciplinary Art MFA, Youngstown State University
- 2017-18 Multi-Media Classroom (MMCR) Committee, Youngstown State University
- 2017-18 Chair's Advisory Committee, Department of Art, Youngstown State University
- 2016-18 Launch Lab Steering Committee, Youngstown State University (launchlab.yzu.edu)
- 2017 Search Committee, Studio Art Support Specialist, Youngstown State University
- 2016-17 Foundations Committee, Department of Art, Youngstown State University
- 2016-17 Library Liaison, Department of Art, Youngstown State University
- 2010-15 Recruitment, Center for Digital Arts and Experimental Media, University of Washington
- 2013 Website Committee, Center for Digital Arts and Experimental Media, University of Washington

TECHNICAL EXPERTISE

Programming: Processing, OpenFrameworks, C, C++, python, Java, JS, PHP, SQL, HTML; sound (SuperCollider, Pure Data, Max/MSP); video (OpenCV, GLSL Shaders, CUDA, PD/GEM); Docker, Amazon Web Services, Torch; jupyter, docker, kubernetes, pandas, scipy, numpy. Expertise with computer vision, machine perception, edge computing, virtualization, data science, and interactive systems development.

Mechatronics and Embedded Systems: Microcontrollers (Arduino, BLE, Broadcom WICED); PCB production (EagleCAD, KiCAD, BoardCAM, FlatCAM, etching, LPKF and Nomad circuit mills);

embedded systems (Raspberry Pi, Beaglebone, hardware interfacing); mechatronic automation (servo, stepper, encoder, motor driver and power supply design).

Modeling and Digital Fabrication: CAD (Rhino, Solidworks, Fusion 360, Meshmixer); CAM (MasterCAM, RhinoCAM); 3D printing (Cura, Makerware, Slic3r); CNC (Hurco and Trak 3-axis mills, TechnoCNC and Shopbot routers); laser cutter (Universal, Eplilog); hybrid traditional/CNC processes including mold making and foundry.

Computer Graphics and 3D Imaging: 3D scanning (Laser scanner, Kinect, Sense 3D, Structured light, MRI); photogrammetry (VSFM, photoscan); mesh editing (Meshmixer, Meshlab, Rhino); animation (Maya, Mental Ray, Python/MEL scripting, Blender); video (After Effects, Final Cut Pro), design and fabrication of 3d projection apparatus.

Studio and Shop Craft: carpentry and joinery, metal shop experience, mill and lathe operation, MIG and TIG welding, drawing, oil and acrylic painting, intaglio printmaking.