EMILY WHITING

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EDUCATION

Massachusetts Institute of Technology

2012	Ph.D. Computer Graphics & Building Technology, *MIT Presidential Fellow*
2006	M.S. Design & Computation

University of Toronto

2004	B.A.Sc. Engineering Science (with Honors), Faculty of Applied Science and Engineering

ACADEMIC POSITIONS

2017 – present	Assistant Professor, Boston University, Department of Computer Science *Innovation Career Development Professorship*
2014 – 2017	Assistant Professor, Dartmouth College, Department of Computer Science
2011 – 2014	Postdoctoral Researcher, ETH Zurich, Institute of Visual Computing Interactive Geometry Lab, *ETH Zurich/Marie Curie Cofund Fellow*
2006 – 2011	Ph.D. Research Assistant, MIT, Department of Computer Science Computer Graphics Group, *MIT Presidential Fellow*
2004 – 2006	M.S. Research Assistant, MIT, Department of Computer Science Robotics, Vision & Sensor Networks Group
Summer 2001 – 2004	Undergraduate Research Assistant, National Research Council of Canada Visual Information Technology Group, *Women in Engineering and Science Fellow*

GRANTS

2018 – 2021	National Science Foundation (NSF). Computer and Information Science and Engineering (CISE): Robust Intelligence (RI): "Computational Joinery." Co-Principal Investigator.
2018 – 2020	BU Hariri Institute Research Incubation Award: "Data-Driven Design of Tough 3D Printed Structures." Principal Investigator.
2015 – 2018	National Science Foundation (NSF). Computer and Information Science and Engineering (CISE): Research Initiation Initiative (CRII): "Structurally-Aware Computation for Geometry Acquisition and Design." Principal Investigator.
2016 – 2017	Dartmouth Neukom Institute. CompX Faculty Grant: "Computational Design of Deployable Structures." Co-Principal Investigator.

AWARDS

2017 – 2020	Innovation Career Development Professorship, Boston University
2012 – 2014	ETH Zurich Postdoctoral Fellowship / Marie Curie COFUND Program
2008 – 2010	Doctoral Scholarship, Natural Sciences & Engineering Research Council of Canada (NSERC)
2006	MIT Ph.D. Presidential Fellowship
2004 – 2006	Graduate Fellowship, MIT Department of Architecture
2007	Best Paper Presentation, Computer Aided Architectural Design Futures
2006	M.S. Thesis Prize, MIT Department of Architecture
2001 – 2004	Women in Engineering and Science Scholarship, National Research Council of Canada

INDUSTRY POSITIONS

Summer 2010	Research & Development Intern, Lucasfilm Industrial Light & Magic	San Francisco, CA
2002 – 2003	Junior Designer, Yolles Partnership Inc., Structural Engineering Division	Toronto, ON

PUBLICATIONS

Refereed Journal, Conference & Workshop Papers

[1] Watercolor Woodblock Printing with Image Analysis
A. Panotopoulou, S. Paris and E. Whiting. Computer Graphics Forum, 2018 (Eurographics 2018 Issue)

[2] Assembling and Disassembling Planar Structures with Divisible and Atomic Components
Y. Zhang, E. Whiting and D. Balkcom. IEEE Transactions on Automation Science and Engineering, 2018

[3] Thermal-Comfort Design of Personalized Casts
X. Zhang, G. Fang, C. Dai, J. Verlinden, J. Wu, E. Whiting and C. Wang. ACM Symposium on User Interface Software and Technology (UIST '17), 2017

[4] Environment-Scale Fabrication: Replicating Outdoor Climbing Experiences
E. Whiting, N. Ouf, L. Makatura, C. Mousas, Z. Shu and L. Kavan. ACM CHI Conference on Human Factors in Computing Systems (CHI '17, Paper), 2017

[5] Assembling and Disassembling Planar Structures with Divisible and Atomic Components
Y. Zhang, E. Whiting and D. Balkcom. Algorithmic Foundations of Robotics (WAFR), 2016

[6] Printone: Interactive Resonance Simulation for Free-form Print-wind Instrument Design
N. Umetani, A. Panotopoulou, R. Schmidt and E. Whiting. ACM Transactions on Graphics, 2016 (ACM SIGGRAPH Asia 2016 Issue)

[7] Data-Driven Bending Elasticity Design by Shell Thickness
X. Zhang, X. Le, Z. Wu, E. Whiting and C. Wang. Computer Graphics Forum, 2016 (Eurographics Symposium on Geometry Processing 2016 Issue)

[8] Buoyancy Optimization for Computational Fabrication
L. Wang and E. Whiting. Computer Graphics Forum, 2016 (Eurographics 2016 Issue)

[9] Foldlings: A Tool for Interactive Pop-Up Card Design
N. Harquail, M. Allen and E. Whiting. Eurographics Workshop on Graphics for Digital Fabrication, 2016

[10] Perceptual Models of Preference in 3D Printing Orientation
X. Zhang, X. Le, A. Panotopoulou, E. Whiting and C. Wang. ACM Transactions on Graphics, 2015 (ACM SIGGRAPH Asia 2015 Issue)

[11] A 3-D Stability Analysis of Lee Harvey Oswald in the Backyard Photo
S. Pittala, E. Whiting and H. Farid. Journal of Digital Forensics, Security and Law, 2015

[12] Assembling Self-Supporting Structures
M. Deuss, D. Panozzo, E. Whiting, Y. Liu, O. Sorkine-Hornung and M. Pauly. ACM Transactions on Graphics, 2014 (ACM SIGGRAPH Asia 2014 Issue)

[13] Spin-It: Optimizing Moment of Inertia for Spinnable Objects
M. Baecher, E. Whiting, B. Bickel and O. Sorkine-Hornung. ACM Transactions on Graphics, 2014 (ACM SIGGRAPH 2014 Issue)

[14] A Graph-based Approach for Discovery of Stable Deconstruction Sequences
L. Beyeler, J.-C. Bazin and E. Whiting. Advances in Architectural Geometry, 2014

[15] Make It Stand: Balancing Shapes for 3D Fabrication
R. Prévost, E. Whiting, S. Lefebvre and O. Sorkine-Hornung. ACM Transactions on Graphics, 2013 (ACM SIGGRAPH 2013 Issue)

[16] Structural Optimization of 3D Masonry Buildings
E. Whiting, H. Shin, R. Wang, J. Ochsendorf and F. Durand. ACM Transactions on Graphics, 2012 (ACM SIGGRAPH Asia 2012 Issue)

[17] Procedural Modeling of Structurally-Sound Masonry Buildings
E. Whiting, J. Ochsendorf and F. Durand. ACM Transactions on Graphics, 2009 (ACM SIGGRAPH Asia 2009 Issue)

[18] Detailed 3D Modeling of Castles
S. El-Hakim, L. Gonzo, F. Voltolini, S. Girardi, A. Rizzi, F. Remondino and E. Whiting. Intl. Journal of Architectural Computing (IJAC), 2007

[19] Generating A Topological Model of Multi-Building Environments
E. Whiting, J. Battat and S. Teller. Computer-Aided Architectural Design Futures, 2007 (*Awarded Best Paper Presentation*)

[20] Constrained Planar Remeshing for Architecture
B. Cutler and E. Whiting. Graphics Interface, 2007

[21] 3D Modeling with Reusable and Integrated Building Blocks
S. El-Hakim, E. Whiting and L. Gonzo. Optical 3D Measurement Techniques, 2005

[22] A Hierarchical 3D Reconstruction Approach for Documenting Complex Heritage Sites
S. El-Hakim, J.-A. Beraldin, L. Gonzo, E. Whiting and M. Jemtrud. CIPA Intl Symposium, ICOMOS & ISPRS Committee on Documentation of Cultural Heritage, 2005

[23] Digital Recording of Aboriginal Rock Art
S. El-Hakim, J. Fryer, M. Picard and E. Whiting. Virtual Systems and Multimedia (VSMM), 2004

[24] Photo-Realistic 3D Reconstruction of Castles with Multiple Sources Image-Based Techniques
L. Gonzo, S. El-Hakim, M. Picard, S. Girardi and E. Whiting. Congress Intl Society for Photogrammetry & Remote Sensing (ISPRS), 2004

Invited Journal Publications

[25] Spin-It: Optimizing Moment of Inertia for Spinnable Objects
M. Bächer, B. Bickel, E. Whiting, and O. Sorkine-Hornung. Communications of the ACM: Research Highlights, August 2017

Invited Courses

[26] 3D Printing Oriented Design: Geometry and Optimization
L. Liu, C. Wang, A. Shamir and E. Whiting. ACM SIGGRAPH Asia, Invited Course, 2014

Refereed Sketches, Posters & Videos

[27] Watercolor Woodblock Printing with Image Analysis
A. Panotopoulou, S. Paris and E. Whiting. Symposium on Computational Fabrication, Poster session, 2018.

[28] Perceptual Models of Preference in 3D Printing Orientation
X. Zhang, X. Le, A. Panotopoulou, E. Whiting and C. Wang. Symposium on Computational Fabrication, Poster session, 2016

[29] Digital Reconstruction and 4D Presentation through Time
S. El-Hakim, J.F. Lapointe and E. Whiting. ACM SIGGRAPH Technical Sketches, 2008

[30] Constrained Planar Remeshing for Architecture
B. Cutler and E. Whiting. Eurographics Symposium on Geometry Processing, Poster session, 2006

[31] PORTALS
Directors: S. El-Hakim and M. Picard. Contributed 3D scene modeling. ACM SIGGRAPH Video Review Issue 143, Animation Theater Program, 2002

Other Media

[32] The Metopes of Selinunte
Directors: V. Valzano, A. Bandiera and J.A. Beraldin. Contributed 3D animation. CD-ROM.
Coordinamento SIBA, University of Lecce, 2006 (*e-Science Award Italy)*

Theses

[33] Design of Structurally Sound Masonry Buildings Using 3D Static Analysis
Advisors: John Ochsendorf and Frédo Durand. PhD Thesis, Massachusetts Institute of Technology, 2011

[34] Geometric, Topological & Semantic Analysis of Multi-Building Floor Plan Data
Advisor: Seth Teller. MSc Thesis, Massachusetts Institute of Technology, 2006

[35] Realism in 3D Virtual Spaces: Improving Texture Quality in Image-Based Modeling Systems through
Application of High Dynamic Range Imagery
Advisors: Sabry El-Hakim and Demetri Terzopoulous. BASc Thesis, University of Toronto, 2002

SELECT INVITED TALKS

July 2018	Summer Pathways: high school outreach program, Boston University. Invited Career Panel.
May 2018	Graphics Interface Intl Conference, Speaker Series. Invited Speaker.
Oct 2017	McGill University, Computer Science Colloquium. Invited Talk.
May 2016	1st Eurographics Workshop on Graphics for Digital Fabrication. Invited Expert Panelist.
Feb 2015	MIT Department of Architecture, Building Technology Lecture Series. Invited Speaker.
Dec 2014	SIGGRAPH Asia, Course: "3D Printing Oriented Design: Geometry & Fabrication." Invited Course Instructor, "Structural aspects of geometry design."
Nov 2014	TEDxBeaconStreet, "3D Printing: the Physics of Objects." Invited Speaker.
Sept 2014	Schloss Dagstuhl Seminar: Computational Aspects of Fabrication. Germany. Invited Talk.
June 2013	3D Fabrication Summer School, UCL, Center for Virtual Environments, Imaging & Visualization. London, UK. Invited Speaker.
June 2012	Autodesk Research, Toronto, Canada. Invited Talk.
April 2011	Science-Engineering-Technology (SET) in the City Program, Museum of Science, Boston. Invited Panelist: Young Women in STEM.
Aug 2010	R&D Group, Industrial Light & Magic, Lucasfilm Ltd., San Francisco. Invited Talk.
Nov 2009	INRIA Grenoble – Rhône-Alpes Research Center, Montbonnot, France. Invited Talk.
April 2008	American Academy in Rome, New York, USA. Invited Speaker & Panelist.
Feb 2008	Google Workshop for Women Engineers, PhD Discussion Panel, San Jose, USA. Invited Talk.

SELECT MEDIA COVERAGE

April 2018	Outside. "How Two Scientists Will Build Mountains." *https://www.outsideonline.com/2269356/how-two-scientists-will-build-mountains*
Nov 2017	3DPrint.com. "Researchers Take Patient Heat Sensitivity Into Account When Developing 3D Printable Orthopedic Cast." *https://3dprint.com/192877/3d-printed-cast-thermal-comfort/*
June 2017	U.S. News & World Report. "System aims to recreate challenging mountain climbs in gym." *https://www.usnews.com/news/best-states/utah/articles/2017-06-04/system-aims-to-recreate-challenging-mountain-climbs-in-gym*
May 2017	TechCrunch. "New system can recreate natural rock-climbing walls indoors." *https://techcrunch.com/2017/05/09/new-system-can-recreate-natural-rock-climbing-walls-indoors/*
May 2017	CNN. "3D modeling lets rock climbers replicate real mountains -- in the gym." *http://money.cnn.com/2017/05/09/technology/3d-modeling-rock-climbing*

Dec 2016	New Atlas. "3D-printing software reshapes musical instrument design." *http://newatlas.com/printone-free-form-wind-instruments/*
Dec 2016	3Ders. "New 'Printone' design tool lets you 3D print wind instruments in crazy shapes." *http://www.3ders.org/articles/20161206-new-printone-design-tool-lets-you-3d-print-wind-instruments-in-crazy-shapes.html*
Oct 2015	BBC Radio: In Short (interview). "Was controversial Lee Harvey Oswald photo faked?" *http://www.bbc.co.uk/programmes/p035sqvx*
Oct 2015	Discovery News. "Oswald Photo Isn't Fake, Finds Digital Forensics." *http://www.seeker.com/oswald-photo-isnt-fake-finds-digital-forensics-1770368711.html*
May 2015	Dartmouth Now. "Creativity, Cathedrals, and Collaboration in Computer Science." *https://news.dartmouth.edu/news/2015/05/creativity-cathedrals-and-collaboration-computer-science*
Aug 2014	TechCrunch. "Disney Conquers Physics, Uses 3D Printing To Create Impossible Spinning Tops." *https://techcrunch.com/2014/08/08/disney-conquers-physics-uses-3d-printing-to-create-impossible-spinning-tops/*
Aug 2014	Engadget. "Disney has created an algorithm that can turn almost anything into a spinning top." *https://www.engadget.com/2014/08/09/disney-tops/*
July 2013	MIT Technology Review: Computing News. In Article: "The Future of Graphics and Gaming." *https://www.technologyreview.com/s/517461/the-future-of-graphics-and-gaming/*
March 2011	PBS NOVA. "The Secret Life of Scientists & Engineers". Featured Scientist, Season 2011, Episode 39. *http://www.pbs.org/video/secret-life-of-scientists-emily-whiting-architectural-engineer/*

STUDENT ADVISING

Boston University

2017 – present	Xiaoting Zhang, Postdoc
2017 – present	Athina Panotopoulou, PhD student
2018 – present	Benjamin Verdier, PhD student
2018 – present	Zezhou Sun, PhD student
2017 – present	Anthea Yichen Li, Undergraduate Research Opportunities Program, Arts Initiative Summer Research Award
Summer 2018	Joy Zhaoyi Ding, Greater Boston Research Opportunities for Young Women (GROW)
2017 – 2018	Qiwei Zheng, Master Project

Dartmouth College

2016 – 2017	Xiaoting Zhang, Postdoc
2015 – 2017	Athina Panotopoulou, PhD student
2015 – 2017	Liane Makatura, Undergraduate Presidential Scholar (now Fulbright Scholar at EPFL)
2015 – 2016	Christos Mousas, Postdoc (now Assistant Professor at Southern Illinois University)
2015 – 2016	Rawan Al Ghofaili, PhD student
2016	Lily Xu, Undergraduate Presidential Scholar
2016	Alex Weinberg, Undergraduate Presidential Scholar
2014 – 2015	Srivamshi Pittala, PhD student
2015	Lingfeng Wang, Master Thesis: "Buoyancy Optimization for Computational Fabrication"
2015	Nook Harquail & Marissa Allen, Joint Master Thesis: "Foldlings: Visualization Tools for Interactive Pop-up Card Design"

ETH Zurich

2013 – 2014	Lukas Beyeler, Master Thesis: "Mikado: Which Objects to Pick Up in A Safe Way?"
2012 – 2013	Clea Benz, Undergraduate Thesis: "3D Scene Flow Estimation of Deforming Architectural Models with Feature Tracking"

TEACHING

Boston University, Department of Computer Science

Fall 2018   CAS CS 480/680: Introduction to Computer Graphics
Spring 2018   CAS CS 591: Computational Fabrication

Dartmouth College, Department of Computer Science

Fall 2016   COSC 89/189: Computational Fabrication
Spring 2016   COSC 89/189: Computational Fabrication
Winter 2016   COSC 98: Senior Design & Implementation Project
Fall 2015   COSC 77/177: Computer Graphics
               COSC 98: Senior Design & Implementation Project
Spring 2015   COSC 77/177: Computer Graphics
Fall 2014   COSC 89/189: Computational Fabrication

ETH Zurich, Department of Computer Science

Fall 2012   Seminar, Advanced Topics in Computer Graphics and Vision (Teaching Assistant)
Spring 2012   Shape Modeling and Geometry Processing (Guest Lecturer)

MIT, Department of Computer Science

Fall 2007   6.837 Introduction to Computer Graphics (Teaching Assistant)

PROFESSIONAL ACTIVITIES

Program Committees:

2018   ACM SIGGRAPH Technical Papers Committee
          Advances in Architectural Geometry Papers Committee
2017   Eurographics International Program Committee
2016   ACM SIGGRAPH Asia Technical Papers Committee
          Symposium on Solid and Physical Modeling Program Committee
          Eurographics Workshop on Graphics for Digital Fabrication Intl Program Committee
          Advances in Architectural Geometry Papers Committee
2015   ACM SIGGRAPH Technical Papers Committee
          Pacific Graphics International Program Committee
2014   ACM SIGGRAPH Asia Courses Committee
          Graphics Interface Program Committee
          Advances in Architectural Geometry Papers Committee
          Pacific Graphics International Program Committee
2013   ACM SIGGRAPH General Submissions Committee
          Pacific Graphics International Program Committee

Conference Chair:

2018   ACM Symposium on Computational Fabrication, Technical Program Co-Chair

Editorial Positions:

2018 – present ACM Transactions on Graphics (ToG), Associate Editor
2014 – 2016   The Visual Computer: International Journal of Computer Graphics, Associate Editor

Judging Panels:

2015   HackDartmouth Judging Panel
2015   Grace Hopper ACM Student Research Competition Jury
2013   SIGGRAPH ACM Student Research Competition Jury

Technical Papers Reviewer:

ACM SIGGRAPH, ACM SIGGRAPH Asia, ACM Transactions on Graphics, ACM UIST, ACM CHI, Computer Graphics Forum, Eurographics, Transactions on Visualization and Computer Graphics