

EMILY WHITING

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Boston MA 02215
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EDUCATION

Massachusetts Institute of Technology

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

University of Toronto

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

ACADEMIC & INDUSTRY POSITIONS

2017 – present Assistant Professor, Boston University Boston, MA
Department of Computer Science

2014 – 2017 Assistant Professor, Dartmouth College Hanover, NH
Department of Computer Science

2011 – 2014 Postdoctoral Researcher, ETH Zurich Zurich, Switzerland
Institute of Visual Computing, Interactive Geometry Lab
ETH/Marie Curie Cofund Fellow

2006 – 2011 Ph.D. Research Assistant, MIT Cambridge, MA
Department of Computer Science, Computer Graphics Group
MIT Presidential Fellow

Summer 2010 Research & Development Intern, Lucasfilm San Francisco, CA
Industrial Light & Magic

2004 – 2006 M.Sc. Research Assistant, MIT Cambridge, MA
Department of Computer Science, Robotics, Vision & Sensor Networks Group

Summer 2001 – 2004 Research Assistant, National Research Council of Canada Ottawa, ON
Visual Information Technology Group
Women in Engineering and Science Fellow

2002 – 2003 Junior Designer, Yolles Partnership Inc. Toronto, ON
Structural Engineering Division

AWARDS & FUNDING

2015 – 2018 National Science Foundation. 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.

2016 – present Adobe Systems. Corporate Gift.

2012 – 2014 ETH Zurich Postdoctoral Fellowship / Marie Curie COFUND Program

2008 – 2010 Doctoral Scholarship, Natural Sciences & Engineering Research Council of Canada (NSERC)

2006 – 2007 MIT Presidential Fellowship

2004 – 2006 Graduate Fellowship, MIT Department of Architecture

2006 M.Sc. Thesis Prize, MIT Department of Architecture

2001 – 2004 Women in Engineering and Science Scholarship, National Research Council Canada

PUBLICATIONS

Refereed Publications

- [1] 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, *accepted for publication*
- [2] 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
- [3] Assembling and Disassembling Planar Structures with Divisible and Atomic Components
Y. Zhang, E. Whiting, and D. Balkcom. Algorithmic Foundations of Robotics (WAFR), 2016
- [4] 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)
- [5] 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)
- [6] Buoyancy Optimization for Computational Fabrication
L. Wang and E. Whiting. Computer Graphics Forum, 2016 (Eurographics 2016 Issue)
- [7] Foldlings: A Tool for Interactive Pop-Up Card Design
N. Harquail, M. Allen and E. Whiting. Eurographics Workshop on Graphics for Digital Fabrication, 2016
- [8] 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)
- [9] 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
- [10] 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)
- [11] 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)
- [12] A Graph-based Approach for Discovery of Stable Deconstruction Sequences
L. Beyeler, J.-C. Bazin and E. Whiting. Advances in Architectural Geometry, 2014
- [13] 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)
- [14] 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)
- [15] Procedural Modeling of Structurally-Sound Masonry Buildings
E. Whiting, J. Ochsendorf and F. Durand. ACM Transactions on Graphics, 2009 (ACM SIGGRAPH Asia 2009 Issue)
- [16] 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

- [17] 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)*
- [18] Constrained Planar Remeshing for Architecture
B. Cutler and E. Whiting. *Graphics Interface, 2007*
- [19] 3D Modeling with Reusable and Integrated Building Blocks
S. El-Hakim, E. Whiting and L. Gonzo. *Optical 3D Measurement Techniques, 2005*
- [20] 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*
- [21] Digital Recording of Aboriginal Rock Art
S. El-Hakim, J. Fryer, M. Picard and E. Whiting. *Virtual Systems and Multimedia (VSMM), 2004*
- [22] 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

- [23] 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, July 2017*

Invited Courses

- [24] 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

- [25] 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*
- [26] Digital Reconstruction and 4D Presentation through Time
S. El-Hakim, J.F. Lapointe and E. Whiting. *ACM SIGGRAPH Technical Sketches, 2008*
- [27] Constrained Planar Remeshing for Architecture
B. Cutler and E. Whiting. *Eurographics Symposium on Geometry Processing, Poster session, 2006*
- [28] PORTALS
Directors: S. El-Hakim and M. Picard. *Contributed 3D scene modeling. ACM SIGGRAPH Video Review Issue 143, Animation Theater Program, 2002*

Other Media

- [29] 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

- [30] Design of Structurally Sound Masonry Buildings Using 3D Static Analysis
Advisors: John Ochsendorf and Frédo Durand. *PhD Thesis, Massachusetts Institute of Technology, 2011*
- [31] Geometric, Topological & Semantic Analysis of Multi-Building Floor Plan Data
Advisor: Seth Teller. *MSc Thesis, Massachusetts Institute of Technology, 2006*

- [32] 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 Terzopoulos. BAsC Thesis, University of Toronto, 2002

INVITED TALKS

- April 2017 Tufts Computer Science Colloquium. Invited Talk.
 March 2017 Boston University Computer Science Colloquium. Invited Talk.
 Sept 2016 MIT Computer Graphics Group Seminar. Invited Talk.
 May 2016 1st Eurographics Workshop on Graphics for Digital Fabrication. Invited Expert Panelist.
 Nov 2015 Mount Holyoke College, Computer Science Seminar. Invited Talk.
 Feb 2015 MIT Department of Architecture, Building Technology Lecture Series. Invited Talk.
 Dec 2014 SIGGRAPH Asia, Course: "3D Printing Oriented Design: Geometry & Fabrication." Invited Course Instructor, "Structural aspects of geometry design."
 Dec 2014 Hong Kong University, Computer Graphics Group Seminar. Invited Talk.
 Nov 2014 TEDxBeaconStreet, "3D Printing: the Physics of Objects." Invited Speaker.
 Sept 2014 Schloss Dagstuhl Seminar: Computational Aspects of Fabrication. Germany. Invited Talk.
 Oct 2013 UC Berkeley, Visual Computing Lab Seminar, Computer Science Division. Invited Talk.
 June 2013 3D Fabrication Summer School, UCL, Center for Virtual Environments, Imaging & Visualization. London, UK. Invited Talk.
 June 2012 Autodesk Research, Toronto, Canada. Invited Talk.
 Oct 2011 Boston University Computer Science Colloquium. Invited Talk.
 April 2011 Science-Engineering-Technology (SET) in the City Program, Museum of Science, Boston. Invited Panelist: Young Women in STEM.
 March 2011 Harvard SEAS Graphics, Vision, and Interaction Group. Invited Talk.
 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 talk & Panelist.
 Feb 2008 Google Workshop for Women Engineers, PhD Discussion Panel, San Jose, USA. Invited Talk.

MEDIA COVERAGE

- 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/>
- July 2013 Gizmag: Electronics. "Make It Stand quickly optimizes your model's balance for 3D printing." <http://www.gizmag.com/make-it-stand-optimized-balance-3d-printing/28472/>
- March 2011 PBS NOVA. "The Secret Life of Scientists & Engineers". Featured Scientist, Season 2, Ep. 14. <http://www.pbs.org/wgbh/nova/secretlife/scientists/emily-whiting/>

STUDENT ADVISING

Boston University

- 2017 – present Xiaoting Tina Zhang, Postdoc
 2017 – present Athina Panotopoulou, PhD student

Dartmouth College

- 2016 – 2017 Xiaoting Tina 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 Marissa Allen, Master Thesis (with N. Harquail): "Foldlings: Visualization Tools for Interactive Pop-up Card Design"
 2015 Nook Harquail, Master Thesis (with M. Allen): "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

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:

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
ACM SIGGRAPH Student Research Competition Jury
Pacific Graphics International Program Committee

Editorial Positions:

2014 – 2016 The Visual Computer: International Journal of Computer Graphics, Associate Editor

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