

Alec Jacobson

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Research Interests

- Computer graphics, animation and geometric modeling. In particular: interactive shape modeling, interactive animation tools, 3D input devices and user interfaces, and digital geometry processing.

Education

- Ph.D. (candidate) Eidgenössische Technische Hochschule Zürich, Computer Science, 2011-*present*
- M.A. New York University, Computer Science, May 2011: 4.0 GPA
- B.A. New York University, Mathematics & Computer Science Joint Major with high departmental honors, 2009, Magna Cum Laude: 3.806 GPA
- Honors Diploma Graduate, Mayo High School, Rochester, MN, 2005: 5.15 out of a 4.0 weighted GPA
- Graduate, University of Minnesota Talented Youth Math Program (UMTYMP Algebra I and II, Geometry, Math Analysis, Calculus I, II and III), Sept. 1999 - May 2004: 4.0 GPA

Relevant Courses Taken

Advanced Computer Graphics	Geometric Modeling	Visualization
Numerical Computing	Computational Photography	High Performance Computing
Theory of Computation	Analysis of Algorithms	Computer Games
Calculus I, II, III	Linear Algebra	Combinatorics
Abstract Algebra I, II	Complex Variables I, II	Analysis I, II

Computer Skills

MATLAB	C, C++	Java, C#	Mathematica	Maple	LaTeX, TeX
Qt	Ruby	Python	PHP	HTML	Javascript
OpenGL	UNIX tools	CGAL	CUDA	OpenMP	XNA
Development:	Vim	Xcode	Visual Studio	Eclipse	NetBeans

Awards, Scholarships, Fellowships Received

- Back Cover Image, Proceedings of ACM SIGGRAPH, 2011
- New York University Henry M. MacCracken Fellowship, 2009-2011
- Grand Prize, Games For Learning Institute Game Design Challenge 2009, funded by Microsoft Research
- New York University Founder's Day Award, 2009
- New York University Trustee's Scholarship, 2005-2009
- Mayo Foundation Scholarship, 2005-2009
- New York University Dean's list, 2006, 2008, 2009
- Mayo Clinic Summer Mentored Undergraduate Research Fellowship, 2007

Research Experience

- PhD Research, Advisor: Olga Sorkine, Interactive Geometry Lab, ETH Zurich, Zurich, Switzerland, Summer 2011 - present
- PhD Research, Advisor: Olga Sorkine, Media Research Lab, New York University, New York, NY, Fall 2009 - Spring 2011
- Summer Research Intern, Advisor: Jovan Popović, Creative Technologies Lab, Adobe Systems, Seattle, WA, Summer 2010
- Undergraduate Research, Advisor: Denis Zorin, Media Research Lab, New York University, New York, NY, Fall 2008, Spring 2009
- Summer Mentored Undergraduate Research Fellowship, Advisor: Zeljko Bajzer, Mayo Clinic, Rochester, MN, 2007

Publications

- Alec Jacobson, Ilya Baran, Ladislav Kavan, Jovan Popović, Olga Sorkine. “Fast Automatic Skinning Transformations.” ACM SIGGRAPH 2012.
- Alec Jacobson, Olga Sorkine. “A Cotangent Laplacian Images as Surfaces.” ETH Zurich, Technical Report 2012.
- Alec Jacobson, Olga Sorkine. “Stretchable and Twistable Bones for Skeletal Shape Deformation.” ACM SIGGRAPH Asia 2011.
- Alec Jacobson, Ilya Baran, Jovan Popović, Olga Sorkine. “Bounded Biharmonic Weights for Real-Time Deformation.” ACM SIGGRAPH 2011.
- Alec Jacobson, Elif Tosun, Olga Sorkine, Denis Zorin. “Mixed Finite Elements for Variational Surface Modeling.” Eurographics/ACM SIGGRAPH Symposium on Geometry Processing 2010.

Research Projects

- Bounded biharmonic weights, automatically computing correspondence weights for skinning techniques, unifying skeleton, cage and point controls, with Ilya Baran (MIT and Disney Research Zurich), Jovan Popović (Adobe Systems), and Olga Sorkine (New York University and ETH Zurich), 2010-2011.
- Mixed finite element methods for variational surface optimization, examining boundary conditions and system formation for solving biharmonic and triharmonic equations, with Olga Sorkine and Denis Zorin, New York University, 2009-2010.
- 3D curve construction from a single 2D sketch using nonlinear optimization, with Deniz Zorin and Yotam Gingold, New York University, 2008-2009.
- Packing spheres in 3D to simulate chaotic ABC molecules in near 2D environments, with Željko Bajzer, Mayo Clinic, 2007.

Work Experience

- America Counts Math Intervention Tutor and Student Teacher at Clinton Public Middle School for Artists and Writers, New York, NY, Spring/Fall 2008, Spring 2009
- Calculus and Basic Algorithms Homework Grader, Math Department, New York University, New York, NY, Spring 2006, Spring/Fall 2007, Spring 2008, Spring 2009
- Intern at the IBM Executive Briefing Center, Rochester, MN, Summer 2008

References

- Olga Sorkine, Assistant Professor, Institute for Visual Computing, Department of Computer Science, ETH Zurich, CNB G 106.2, Universitaetstrasse 6, 8092 Zurich, + 41 44 632 83 57, sorkine@inf.ethz.ch (PhD advisor, 2009-present)
- Jovan Popović, Principal Scientist, Advanced Technology Labs, Adobe Systems, 801 N. 34th Street, Seattle, WA 98103, 206-675-7000 (Internship advisor, summer 2010)
- Denis Zorin, Associate Professor, Computer Science Department, Courant Institute of Mathematical Sciences, New York University, 719 Broadway, New York, NY 10003, 212-998-3405 (Undergraduate research advisor, 2008-2009)
- Željko Bajzer, PhD, Mayo Clinic, 200 First St SW, Rochester, MN 55905, 507-284-8584, bajzer@mayo.edu (Mentor for Summer Undergraduate Research Fellowship 2007)

Teaching Experience

- Computer Graphics, Teaching Assistant, ETH Zurich, Zurich, Switzerland, Fall 2011
- America Counts Math Intervention Tutor and Student Teacher at Clinton Public Middle School for Artists and Writers, New York, NY, 2008-2009
- Calculus Grader, Math Department, New York University, New York, NY, Spring 2006, Spring/Fall 2007, Spring 2008
- Volunteer computer programming teacher at Courant Splash! (cSplash), NYU, one-day festival of classes in the mathematical and computer sciences for high school students, Spring 2008
- Volunteer tutor at Rochester English for Speakers of Other Languages Summer School, Summer 2007
- Volunteer tutor for three elementary school boys from an African refugee family living in the South Bronx, 2005-2006

Invited talks

- LiberoVision, Zurich, *Real-time Shape Deformation: Bounded Biharmonic Weights and Stretchable, Twistable Bones*, invited by Remo Ziegler, February 2, 2012
- DISI University of Genoa, *Real-time Deformation: Bounded Biharmonic Weights and Stretchable, Twistable Bones*, invited by Enrico Puppo, June 27, 2011
- ETH Zurich-Disney Research Zurich Tech Talk, *Mixed Finite Elements for Variational Surface Modeling*, invited by Alexander Hornung, October 20, 2010

Languages

English (native)
Spanish (proficient)
German (beginner)

Academic Service

- EUROGRAPHICS Short Papers Program Committee Member, 2012
- **Reviewer:**
 - ECCV European Conference on Computer Vision
 - EUGRAPHICS
 - EUGRAPHICS Short Papers
 - Graphics Interface
 - IEEE Computer Graphics and Applications
 - IEEE Transactions on Visualization and Computer Graphics
 - Pacific Graphics

Solo Art Exhibitions

- Jewcy Main Office, Brooklyn, NY, 2008
- The Bronfman Center Gallery, New York, NY, 2008
- Jewcy's Online Featured Artist, Brooklyn, NY, 2008

Group Art Exhibitions

- "Einstein on Witherspoon Street: Expressions for Social Justice," The Bronfman Center Gallery, New York, NY, 2009
- "Becoming: Visions of Childhood," The Bronfman Center Gallery, New York, NY, 2008
- "Muslim-Jewish Art Collaborative Project," The Bronfman Center Gallery, New York, NY, 2008
- "Clear Is Not a Color," L. Iago Gallery, New York, NY, 2006