

Ilya Baran

Stolzestrasse 3
8006 Zürich, Switzerland

ibaran@mit.edu

Education

Massachusetts Institute of Technology

Cambridge, MA

Ph.D. in Computer Science, Computer Graphics Group 2010
M.Eng., Computer Science, Algorithms Group (GPA 5.0) 2004
B.S., Computer Science and B.S., Mathematics (GPA 4.8) 2003

Work Experience

Disney Research, Zürich 2010–present

- Postdoctoral researcher working on animation, geometry processing, rendering, and data-driven materials.
- Two patents pending.

SolidWorks Corporation Summer 2009

- Development and architecture on several projects in C# and C++ (NDA precludes details).
- Evaluated geometric constraint solvers, comparing capabilities and results.

Pixar Animation Studios, Tools Research Summer 2008

- Extended and optimized Pixar’s system for transferring surface data between meshes.
- Designed novel algorithms for character articulation based on generalized barycentric coordinates.

aPriori Summer 2007

- Designed and implemented fast geometric algorithms in Java for analyzing a 3D part to estimate its manufacturing cost.
- Algorithms implemented include wall thickness analysis, green sand breakage analysis, accessibility analyses for milling and casting, and bar and tube stock recognition.

Solidworks Corporation Summers 2002–2006

- Developed a novel smooth surface representation that became the basis of the Cosmic Blobs 3D modeling software.
- Architected and implemented major parts of the Cosmic Blobs geometric engine in C++, including the topology infrastructure, surface meshing, and selection.
- Designed and implemented automatic animation and surface painting for Cosmic Blobs.
- Rearchitected and rewrote the Cosmic Blobs graphics engine as a scene graph on top of OpenGL, leading to 2–6x framerate improvements on contemporary video cards.
- One patent granted.

Solidworks Corporation Summer 2001

- Architected and implemented an extensible prototype for exploring new ideas in solid modelling using C++ with HOOPS3D, Parasolid, and Qt.
- Developed and implemented optimization heuristics for boolean directed acyclic graphs.
- One patent granted.

Solidworks Corporation Summer 2000

- Designed and implemented a distributed real-time collaboration framework prototype in Java using RMI.
- Implemented a working solid modeller on top of that framework and Solidworks using Swing and Java3D.

Solidworks CorporationSummer 1999

- Designed and implemented a detail drawing interpretation engine in C++.
- Participated in architecture and specification of requirements for eDrawings, a technical drawing format and viewer.
- Two patents granted.

Mitsubishi Electric Research LaboratorySummers 1998–2000

- Developed a 3D facial animation system in C++ using OpenGL and Qt.
- Designed and implemented several algorithms in Matlab for working with facial models.

Languages

C++, Java, C#, Matlab, Mathematica, Python, Scheme

Honors

NSF Graduate Research Fellowship

Akamai Presidential Fellowship

First Place Winner, 2002 MIT ACM/IEEE Annual Programming Competition (6.370)

Nylander Award for Best Advanced Undergraduate Project in EECS

Research Science Institute 1998

Peer-Reviewed Publications

Ilya Baran, Philipp Keller, Derek Bradley, Stelian Coros, Wojciech Jarosz, Derek Nowrouzezahrai, Markus Gross . “Manufacturing Layered Attenuators for Multiple Prescribed Shadow Images” To appear in Eurographics 2012.

Amit Bermanno, Ilya Baran, Marc Alexa, Wojciech Matusik. “SHADOWPIX: Multiple Images from Self-Shadowing.” To appear in Eurographics 2012.

Ilya Baran, Johannes Schmid, Thomas Siegrist, Markus Gross, Robert W. Sumner. “Mixed-Order Compositing for 3D Painting.” In SIGGRAPH Asia 2011.

Michael Holroyd, Ilya Baran, Jason Lawrence, Wojciech Matusik. “Computing and Fabricating Multilayer Models.” In SIGGRAPH Asia 2011.

Alec Jacobson, Ilya Baran, Jovan Popović, Olga Sorkine. “Bounded Biharmonic Weights for Real-Time Deformation.” In SIGGRAPH 2011.

Jiawen Chen, Ilya Baran, Frédo Durand, Wojciech Jarosz. “Real-Time Volumetric Shadows using 1D Min-Max Mipmaps.” In I3D 2011.

Ilya Baran, Jiawen Chen, Jonathan Ragan-Kelley, Frédo Durand, Jaakko Lehtinen. “A Hierarchical Volumetric Shadow Algorithm for Single Scattering.” In SIGGRAPH Asia 2010.

Ilya Baran, Jaakko Lehtinen, Jovan Popović. “Sketching Clothoid Splines Using Shortest Paths.” In Eurographics 2010.

Daniel Vlasic, Pieter Peers, Ilya Baran, Paul Debevec, Jovan Popović, Szymon Rusinkiewicz, Wojciech Matusik. “Dynamic Shape Capture using Multi-View Photometric Stereo.” In SIGGRAPH Asia 2009.

Ilya Baran, Daniel Vlastic, Eitan Grinspun, Jovan Popović. “Semantic Deformation Transfer.” In SIGGRAPH 2009.

Daniel Vlastic, Ilya Baran, Wojciech Matusik, Jovan Popović. “Articulated Mesh Animation from Multi-View Silhouettes.” In SIGGRAPH 2008.

Ilya Baran, Jovan Popović. “Automatic Rigging and Animation of 3D Characters.” In SIGGRAPH 2007.

Ilya Baran, Erik D. Demaine, Dmitriy A. Katz. “Optimally Adaptive Integration of Univariate Lipschitz Functions.” In LATIN 2006. Published in special issue of *Algorithmica*.

Ilya Baran, Erik D. Demaine, Mihai Pătraşcu. “Subquadratic Algorithms for 3SUM.” In WADS 2005. Published in special issue of *Algorithmica*.

Ilya Baran, Erik D. Demaine. “Optimal Adaptive Algorithms for Finding the Nearest and Farthest Point on a Parametric Black-Box Curve.” In SoCG 2004. Published in special issue of *International Journal of Computational Geometry and Applications*.

Teaching Experience

Co-taught Computer Graphics, ETH Zürich Fall 2010
Teaching assistant for graduate Theory of Computation (6.840), MIT Fall 2004

Service

Papers Committee: Symposium on Geometry Processing (SGP) 2011, 2012

Papers reviewer for: SIGGRAPH, SIGGRAPH Asia, SCA, Eurographics, TVCG, CGF