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# Robert Walker Sumner

## **ETH Zürich**

**Contact** **Computer Graphics Laboratory**  
IFW C 26.1  
Haldeneggsteig 4 / Weinbergstrasse  
ETH Zentrum  
8092 Zürich, Switzerland  
+41-44-632 7378 (voice)  
+41-44-632 1596 (fax)  
sumnerb@inf.ethz.ch  
<http://graphics.ethz.ch/~sumnerb/>

**Birth Date** 8 July 1975

**Position** Senior Researcher  
Applied Geometry Group, ETH Zürich

## **Education** **Ph.D. in Electrical Engineering and Computer Science (December 2005)**

Computer Science and Artificial Intelligence Lab  
Massachusetts Institute of Technology, Cambridge, MA  
Advisor: Jovan Popović (Computer Graphics Group)

## **M.S. in Computer Science (May 2001)**

Computer Science and Artificial Intelligence Lab  
Massachusetts Institute of Technology, Cambridge, MA  
Advisor: Julie Dorsey (Computer Graphics Group)

## **B.S. in Computer Science (June 1998)**

College of Computing  
Georgia Institute of Technology, Atlanta, GA

## **Mesh Modification Using Deformation Gradients**

**Doctoral Thesis** I present a differential specification of triangle mesh deformation and show how to use it for deformation transfer and mesh-based inverse kinematics.

**Publications** Kevin G. Der, Robert W. Sumner, and Jovan Popović. “Inverse Kinematics for Reduced Deformable Models” *ACM Transactions on Graphics (Proceedings of SIGGRAPH 2006)*. July 2006.

Mario Botsch, Robert W. Sumner, Mark Pauly, and Markus Gross. “Deformation Transfer for Detail-Preserving Surface Editing.” *To Appear In Vision, Modeling & Visualization 2006*.

Robert W. Sumner, Matthias Zwicker, Craig Gotsman, and Jovan Popović. “Mesh-based Inverse Kinematics.” *ACM Transactions on Graphics (Proceedings of SIGGRAPH 2005)*. August 2005.

Robert W. Sumner and Jovan Popović. “Deformation Transfer for Triangle Meshes.” *ACM Transactions on Graphics (Proceedings of SIGGRAPH 2004)*. 23, 3. August 2004.

**Publications**  
*(continued)*

Robert W. Sumner, Julie Dorsey, and Przemyslaw Prusinkiewicz. “Modeling Lichen Textures Using Diffusion-Limited Aggregation.” To Appear in *The Visual Computer*.

Robert W. Sumner. “Pattern Formation in Lichen.” M.S. Thesis. Electrical Engineering and Computer Science. Massachusetts Institute of Technology. May 2001.

Robert W. Sumner, James O’Brien, and Jessica Hodgins. “Animating Sand, Mud, and Snow.” *Computer Graphics Forum*, March 1999.

Robert W. Sumner, James O’Brien, and Jessica Hodgins. “Animating Sand, Mud, and Snow.” *Graphics Interface ’98*, June 1998.

S. Zou, W. Ribarsky, Y. Jean, J. Heiner, K. Schwan, R. Sumner, O. Okuma. “Collaboration and Visual Steering of Simulations.” *Proceedings of the SPIE—The International Society for Optical Engineering*. 1997.

**Honors**

MIT Sprowls Award Honorable Mention for Best Doctoral Thesis (2006)

NSF Graduate Research Fellowship (1998)

Michael A. J. Sweeney Best Student Paper (1998)

Georgia Tech SAIC Student Paper Competition (1998)

Sigma Xi Undergraduate Research Award (1998)

College of Computing Outstanding Undergraduate Scholar Award (1998)

College of Computing Most Outstanding Rising Senior (1997)

Undergraduate Research Internship Program (1997)

Martin Marietta Scholarship (1996)

Florida Engineering Society Scholarship (1994)

**University  
Research  
Experience**

**MIT Computer Science and Artificial Intelligence Laboratory (2002–2005)**

I worked with Professor Jovan Popović in the Computer Graphics Group. My research centered around methods of reusing triangle mesh deformations for modeling and animation. I created a system to transfer deformation and perform mesh-based inverse kinematics.

**MIT Laboratory for Computer Science (1998–2002)**

Under the supervision of Professor Julie Dorsey in the Computer Graphics Group, I created a biologically motivated model of morphogenesis that can be used to add growth patterns to synthetic objects, increasing their visual realism.

**Georgia Tech Animation Lab (1996–1998)**

I worked with Professor Jessica Hodgins and developed a simulation model of ground surfaces such as sand, mud, and snow that can be deformed by the impact of animated characters. I presented this work at the conference *Graphics Interface 98* where it was selected as the “Michael A. J. Sweeney Best Student Paper.”

**New York University Media Research Lab (Summer 1996)**

I worked with Professor Ken Perlin, helping to create a demonstration of his autonomous character research for the Digital Bayou exhibit at SIGGRAPH 2006.

**Georgia Tech Graphics, Visualization, and Usability Center (1994–1996)**

I helped create tools that address the needs of groups of scientists working on large, time-dependent scientific simulations.

**Pixar Animation Studios (Summer 1999, 2000, 2001)**

***Work Experience*** I worked as a software developer in the Studio Tools group and assisted in the development of the animation software that Pixar uses to create their computer animated films. My project during each of the three summers centered around the internal software that Pixar uses to articulate all of its characters.