

# [Andrew Nealen.]

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RESEARCH INTERESTS            Game design, computer graphics, human perception, interactive techniques, geometric modeling, computer animation, physically-based modeling

CURRENT POSITION            Assistant Professor of Computer Science at Rutgers University

EDUCATION            ♦ **Technische Universität Berlin**, Germany.  
Ph.D. in Computer Science (Summa Cum Laude), 2003 – September 2007.  
Thesis title: *Algorithms and Interfaces for the Creation, Modification and Optimization of Surface Meshes*.

                             ♦ **Technische Universität Darmstadt**, Germany.  
M.Sc. (Dipl.-Inform.) in Computer Science, 1999 – May 2003.  
Thesis title: *Hybrid Texture Synthesis*.

                             ♦ **University of British Columbia**, Canada.  
Fall 2001 – Spring 2002. Graduate Computer Science studies.

                             ♦ **Technische Universität Darmstadt**, Germany.  
M.Sc. (Dipl.-Ing.) in Structural Engineering and Architecture, 1989 – August 1996. Thesis title: *Energy Conserving Construction Design in North America and Europe*.

AWARDS, GRANTS AND SCHOLARSHIPS            ♦ *Apple Design Award 2011* for *Osmos* (June 2011)

                             ♦ Awarded *iPad Game of the Year* for *Osmos* by Apple Computer Inc. (December 2010)

                             ♦ NSF grant for research on *Human Centric Computing: Dynamic Skeletal Part Hierarchies for Sketching 3D Shapes and Their Animations* (2009–2012)

                             ♦ Awarded *best of show* and *most fun/compelling* at IndieCade for video game *Osmos* (October 2009)

                             ♦ D2D vision award at the Independent Games Festival (IGF) for video game *Osmos* (March 2009)

                             ♦ INI-GraphicsNet best paper award (2006)

[Andrew Nealen.]

- ◇ JSPS scholarship for research at The University of Tokyo, Japan (2005)
- ◇ INI-GraphicsNet best thesis award (2003)
- ◇ DAAD graduate scholarship for the University of British Columbia (2001 - 2002)
- ◇ Highest ranked graduate student in Civil Engineering (1997)

## PUBLICATIONS **Journal papers**

- ◇ Adrian Secord, Cynthia Lu, Adam Finkelstein, Manish Singh and Andrew Nealen. A Perceptual Model of Viewpoint Preference. *ACM Transactions on Graphics* Vol. 30, Issue 5, October 2011.
- ◇ Kenshi Takayama, Olga Sorkine, Andrew Nealen and Takeo Igarashi. Volumetric Modeling with Diffusion Surfaces. *ACM Transactions on Graphics* Vol. 29, Issue 5 (*ACM SIGGRAPH ASIA*), 2010.
- ◇ Johannes Zimmermann, Andrew Nealen and Marc Alexa. Sketching Contours. *Computers & Graphics*, 32(3):486–499, 2008.
- ◇ Andrew Nealen, Takeo Igarashi, Olga Sorkine and Marc Alexa. FiberMesh: Designing Freeform Surfaces with 3D Curves. *ACM Transactions on Graphics (Proceedings of ACM SIGGRAPH)*, 26(3), article no. 41, 2007.
- ◇ Andrew Nealen, Olga Sorkine, Marc Alexa and Daniel Cohen-Or. A Sketch-Based Interface for Detail-Preserving Mesh Editing. *ACM Transactions on Graphics (Proceedings of ACM SIGGRAPH)*, 24(3):1142–1147, 2005.
- ◇ Andrew Nealen, Matthias Müller, Richard Keiser, Eddy Boxerman and Mark Carlson. Physically-Based Deformable Models in Computer Graphics. *Computer Graphics Forum*, 25(4):809 - 836, 2005.

## Refereed proceedings

- ◇ Andrew Nealen, Adam Saltsman and Eddy Boxerman. Towards Minimalist Game Design. In proceedings of *Foundations of Digital Games (FDG) 2011*.
- ◇ Péter Borosán, Reid Howard, Shaoting Zhang and Andrew Nealen. Hybrid Mesh Editing. In proceedings of *Eurographics 2010*.
- ◇ Shaoting Zhang, Andrew Nealen and Dimitris Metaxas. Skeleton Based As-Rigid-As-Possible Volume Modeling. In proceedings of *Eurographics 2010*.
- ◇ Andrew Nealen, Justus Pett, Marc Alexa and Takeo Igarashi. GridMesh: fast and high quality 2D Mesh generation for interactive 3D shape modeling. In *IEEE International Conference on Shape Modeling and Applications, 2009 (SMI 2009)*., 155–162, 2009.
- ◇ Johannes Zimmermann, Andrew Nealen and Marc Alexa. SilSketch: Automated Sketch-Based Editing of Surface Meshes. In *Eurographics Workshop on Sketch-Based Interfaces and Modeling*, 23–30, 2007.
- ◇ Andrew Nealen, Takeo Igarashi, Olga Sorkine and Marc Alexa. Laplacian Mesh Optimization. *ACM GRAPHITE*, 381–389, 2006.

[Andrew Nealen.]

- ◇ Anders Adamson, Marc Alexa and Andrew Nealen. Adaptive Sampling of Intersectable Models Exploiting Image and Object-space Coherence. In *ACM SIGGRAPH Symposium on Interactive 3D Graphics and Games*, 171–178, 2005.
- ◇ Matthias Müller, Richard Keiser, Andrew Nealen, Mark Pauly, Markus Gross and Marc Alexa. Point Based Animation of Elastic, Plastic and Melting Objects. In *ACM SIGGRAPH / Eurographics Symposium on Computer Animation*, 141–151, 2004.
- ◇ Andrew Nealen and Marc Alexa. Fast and High Quality Overlap Repair for Patch-Based Texture Synthesis. In *Computer Graphics International*, 582–585, 2004.
- ◇ Andrew Nealen and Marc Alexa. Hybrid Texture Synthesis. In *Eurographics Symposium on Rendering*, 97–105, 2003.

### Book Chapters

- ◇ Andrew Nealen and Marc Alexa. The Creation and Modification of 3D Models Using Sketches and Curves. In *Sketch-Based Interfaces and Modeling*, Springer Berlin Heidelberg, DOI 10.1007/978-1-84882-812-4 (2011).
- ◇ Marc Alexa and Andrew Nealen. Mesh Editing Based on Discrete Laplace and Poisson Models. In *Advances in Computer Graphics and Computer Vision*, Springer Berlin Heidelberg, DOI 10.1007/978-3-540-75274-5 (2008).

### Technical reports

- ◇ Andrew Nealen and Olga Sorkine. A note on boundary constraints for linear variational surface design. Technical Report, TU Berlin, 2007.

### Material science

- ◇ Peter Grübl, Andrew Nealen and Norbert Schmidt. Concrete made from recycled aggregate: experiences from the building project Waldspirale. In *Darmstadt Concrete – Annual Journal 14*, TU Darmstadt, 1999.
- ◇ Peter Grübl and Andrew Nealen. Construction of an office building using concrete made from recycled demolition material. In *Symposium on sustainable construction*, University of Dundee, 1998.
- ◇ Andrew Nealen and Sven Schenk. The Influence of recycled aggregate core moisture on freshly mixed and hardened concrete properties. In *Darmstadt Concrete – Annual Journal 13*, TU Darmstadt, 1998.
- ◇ Christoph Lemmer, Markus Rühl and Andrew Nealen. Correction of consistency of concrete made with aggregates from concrete rubble. In *Darmstadt Concrete – Annual Journal 13*, TU Darmstadt, 1998.
- ◇ Andrew Nealen and Markus Rühl. Consistency aspects in the production of concrete using aggregates from recycled demolition material. In *Darmstadt Concrete – Annual Journal 12*, TU Darmstadt, 1997.

[Andrew Nealen.]

WORK  
EXPERIENCE

- ◇ **Assistant Professor of Computer Science**  
Rutgers University (September 2008 – Today)
- ◇ **Core Team Member**  
Hemisphere Games (September 2007 – Today)
- ◇ **Postdoctoral Researcher and Lecturer**  
Technische Universität Berlin (October 2007 – August 2008)  
Teaching: game design and programming
- ◇ **Research Assistant, Teaching Assistant and PhD Student**  
Technische Universität Darmstadt and  
Technische Universität Berlin (June 2003 – September 2007)  
Teaching: introductory and advanced computer graphics, linear algebra
- ◇ **Software Developer**, Signal 7, Darmstadt, Germany (May 2002 - May 2003)  
Red Bull Web-based Content Management System ([www.redbull.de](http://www.redbull.de))  
Java J2EE/XML/XSL module development for a worldwide operating intranet system
- ◇ **Research and Teaching Assistant**  
Imager Computer Graphics Lab, UBC (September 2001 – April 2002)  
Research: port of existing graphics demo software to SGI OS  
Teaching: advanced software engineering, Java server programming
- ◇ **Software Developer**, Signal 7, Darmstadt, Germany (April 2000 - August 2001) Java module development for various content management systems
- ◇ **Research Assistant, Teaching Assistant and PhD Student**  
Technische Universität Darmstadt (July 1997 – December 1999)  
Teaching: material science, material mechanics, concrete construction  
Research: concrete construction, concrete recycling
- ◇ **Engineering/Architectural Consultant**  
Reuter Architects and Engineers, Idstein, Germany (July 1989 - June 1997)  
Worked in all key areas of construction planning, execution and management  
Design, construction and maintenance of bridges, urban housing, and industrial buildings.

STUDENTS  
CO-ADVISED

- ◇ **Adrian Secord**: Creating collections and evaluating viewpoints: Selection techniques for interface design. New York University, PhD Thesis, September 2010 (Co-advisor: Prof. Denis Zorin, NYU)
- ◇ **Kristian Bergmann**: User Interfaces Based on a Handheld Projection Screen. TU Berlin, M.Sc. Thesis (Dipl.-Inform.), March 2009 (Co-advisor: Prof. Marc Alexa, TU Berlin)
- ◇ **Justus Pett**: Sketching Meshes. TU Berlin, M.Sc. Thesis (Dipl.-Inform.), May 2008 (Co-advisor: Prof. Marc Alexa, TU Berlin)
- ◇ **Johannes Zimmermann**: Automated, Sketch Based Editing of Triangle

[Andrew Nealen.]

Meshes. TU Berlin, M.Sc. Thesis (Dipl.-Inform.), July 2007 (Co-advisor: Prof. Marc Alexa, TU Berlin)

- ◇ **Christian Appelt:** Real-Time 3D Vehicle Simulation. TU Berlin, Undergraduate Thesis, August 2007 (Co-advisor: Prof. Marc Alexa, TU Berlin)
- ◇ **Julien Koenen:** Image Space Smoothies for Real-Time Shadow Rendering on the GPU. TU Darmstadt, Undergraduate Thesis, February 2006 (Co-advisor: Prof. Marc Alexa, TU Darmstadt)
- ◇ **Falk Schaub:** Real-Time Shadow Rendering using Image and Object Space Techniques. TU Darmstadt, M.Sc. Thesis (Dipl.-Inform.), October 2004 (Co-advisor: Prof. Marc Alexa, TU Darmstadt)
- ◇ **Paulo Goncalves:** Simulating Landslides on the GPU. TU Darmstadt, M.Sc. Thesis (Dipl.-Ing.), October 2004 (Co-advisors: Prof. Stefan Schäfer, TU Darmstadt; Prof. Marc Alexa, TU Darmstadt)
- ◇ **Sven Schenk:** The Influence of recycled aggregate core moisture on freshly mixed and hardened concrete properties. TU Darmstadt, M.Sc. Thesis (Dipl.-Ing.), October 1998 (Co-advisor: Prof. Peter Grübl)
- ◇ **Norbert Schmidt:** Concrete made from recycled aggregate: Experiences from the building project Waldspirale. TU Darmstadt, M.Sc. Thesis (Dipl.-Ing.), October 1999 (Co-advisor: Prof. Peter Grübl)

#### RESEARCH VISITS

- ◇ The University of Tokyo, research visit, Autumn 2005. Interactive mesh construction, editing and optimization (with Takeo Igarashi).
- ◇ Tel Aviv University, research visit, Autumn 2004. Sketch based modeling interfaces and interactive shape editing (with Olga Sorkine and Daniel Cohen-Or).
- ◇ ETH Zürich, research visit, January 2004. Point Based Animation of Elastic, Plastic and Melting Objects (with Matthias Müller, Richard Keiser, Mark Pauly and Markus Gross) <http://www.pointbasedanimation.org>.

#### PROFESSIONAL ACTIVITIES

##### **Conference Program Co-Chair**

- ◇ Foundations of Digital Games 2012, Game Design Track Chair
- ◇ IndieCade 2011, Culver City, Los Angeles
- ◇ 2011 Symposium on Sketch Based Interfaces and Modeling, Vancouver, Canada

##### **International Program Committee member**

- ◇ Independent Games Festival (IGF) 2012 Technical Excellence Jury
- ◇ Shape Modeling International 2012
- ◇ Eurographics/ACM SIGGRAPH 2011 Symposium on Geometry Processing
- ◇ Pacific Graphics 2011

[Andrew Nealen.]

- ◇ Independent Games Festival (IGF) 2011 Technical Excellence and Grand Prize Juries
- ◇ Eurographics/ACM SIGGRAPH 2010 Symposium on Geometry Processing
- ◇ 2010 Symposium on Sketch Based Interfaces and Modeling
- ◇ ACM SIGGRAPH 2009 General + Late Breaking Jury
- ◇ ACM SIGGRAPH 2009 Games Papers
- ◇ ACM SIGGRAPH/Eurographics 2009 Symposium on Computer Animation
- ◇ Eurographics/ACM SIGGRAPH 2009 Symposium on Geometry Processing
- ◇ Independent Games Festival (IGF) 2009 Student Games Jury
- ◇ ACM SIGGRAPH 2008 General + Late Breaking Jury
- ◇ ACM SIGGRAPH ASIA 2008 Sketches & Posters
- ◇ Eurographics 2008 Short Papers
- ◇ ACM SIGGRAPH 2007 Sketches & Posters

#### **Talks at conferences and seminars**

- ◇ Towards Minimalist Game Design, *Foundations of Digital Games*, Bordeaux, France, June 2011
- ◇ Minimalist Game Design, *TEDx Rutgers*, April 2011
- ◇ Minimalism and Osmos: A Postmortem, *Game Developers Conference China (GDC China)*, Shanghai, December 2010
- ◇ Minimalist Game Design Principles, *NYU ITP*, New York, October 2010
- ◇ Minimalism and Osmos: A Postmortem, *IndieCade*, Los Angeles, October 2010
- ◇ Minimalist Game Design: Growing Osmos, *University of Southern California (USC)*, August 2010
- ◇ Minimalist Game Design: Growing Osmos, *Game Developers Conference (GDC)*, March 2010
- ◇ Measuring and Modeling Human Preference for Viewpoint Selection and Video Games, *MIT Computer Graphics Seminar*, Boston, February 2010
- ◇ Contemporary Video Game Design Challenges: Visualization, Interaction and Simulation, *Rutgers Perceptual Science Seminar*, September 2009
- ◇ Contemporary Video Game Design Challenges: Visualization, Interaction and Simulation, *DIMACS Workshop on Algorithmic Mathematical Art*, June 2009
- ◇ Simple 3D Content Creation Tools, *IGDA NY*, October 2008
- ◇ In Search of the Human Video-Out, *Rutgers*, October 2008
- ◇ FiberMesh and SilSketch, *Rutgers, The State University of New Jersey*, April 2008
- ◇ FiberMesh and SilSketch, *Princeton Graphics Group*, April 2008

[Andrew Nealen.]

- ◇ Interfaces and Algorithms for the Creation, Modification, and Optimization of Surface Meshes, *Polytechnical University of Catalonia, Barcelona*, February 2008
- ◇ FiberMesh and SilSketch, *Université de Montreal*, August 2007
- ◇ FiberMesh: Designing Freeform Surfaces with 3D Curves, *ACM SIGGRAPH Conference*, San Diego, August 2007
- ◇ Interfaces and Algorithms for the Creation, Modification, and Optimization of Surface Meshes, *REVES/Inria Sophia Antipolis*, June 2007
- ◇ Laplacian Mesh Optimization, *ACM GRAPHITE Conference*, Kuala Lumpur, November 2006
- ◇ Sketch-Based Mesh Deformation and Optimization, *Max Planck Insitut für Informatik*, Saarbrücken, August 2006
- ◇ Physically Based Deformable Models in Computer Graphics, *Ochanomizu University*, November 2005
- ◇ Physically Based Deformable Models in Computer Graphics, *The University of Tokyo*, October 2005
- ◇ Physically Based Deformable Models in Computer Graphics, *Eurographics Conference*, Dublin, August 2005
- ◇ A Sketch-Based Interface for Detail-Preserving Mesh Editing *ACM SIGGRAPH Conference*, Los Angeles, August 2005
- ◇ *Point Based Animation and Continuum Mechanics*, Tel Aviv University, October 2004
- ◇ Point Based Animation of Elastic, Plastic and Melting Objects, *Symposium on Computer Animation*, Grenoble, August 2004
- ◇ Fast and High Quality Overlap Repair for Patch-Based Texture Synthesis, *Computer Graphics International*, Crete, June 2004
- ◇ Hybrid Texture Synthesis, *Eurographics Symposium on Rendering*, Leuven, June 2003

### Reviewer service

- ◇ **Conferences:** Foundations of Digital Games, ACM SIGGRAPH, Eurographics, Eurographics/ACM SIGGRAPH Symposium on Geometry Processing, Eurographics Symposium on Rendering, Graphics Interface, Eurographics/ACM SIGGRAPH Symposium on Computer Animation, Pacific Graphics, Shape Modeling International, ACM Solid and Physical Modeling Symposium, ACM Web3D, IndieCade
- ◇ **Journals:** IEEE Transactions on Visualization and Computer Graphics, IEEE Transactions on Image Processing, IEEE Computer Graphics and Applications, Computer Graphics Forum, Computers & Graphics, Computer Aided Geometric Design, Graphical Models, The Visual Computer
- ◇ **Organizations:** International Game Developers Association (IGDA) Education SIG, Independent Games Festival (IGF), National Science Foundation (NSF), IndieCade

[Andrew Nealen.]

**Press**

- ◇ **Osmos** named iPad game of the year 2010 by Apple Computer Inc. (2010)  
<http://www.hemispheregames.com/2010/12/11/apples-ipad-game-of-the-year/>
- ◇ **Osmos** named best all-time iPhone game on IGN (2010)  
<http://www.ign.com/videos/2010/09/09/the-best-iphone-game-revealed>
- ◇ **Rutgers** video feature on Prof. Nealen's research (2010)  
<http://www.youtube.com/watch?v=iogLHvSqW5g>