

RAMA KARL HOETZLEIN

COMPUTER SCIENTIST / MEDIA ARTIST

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RESEARCH INTERESTS

Rama Karl Höetzlein is a fine artist, computer scientist and media theorist. My work explores new directions in knowledge systems and new media. My goal is to apply high performance computing to investigate intelligent and dynamic systems to further our understanding of ecological issues and our relationship to technology.

EDUCATION

- 2010 **Ph.D, Media Arts and Technology**, University of California Santa Barbara
Imagination in Media Arts: Technological Constraints and Creative Freedom
- 2007 **MS, Media Arts and Technology**, University of California Santa Barbara
The Organization of Human Knowledge: Systems for Interdisciplinary Research
- 2001 **BA, Computer Science**, Cornell University. *Computer Graphics*
- 2001 **BFA, Fine Arts**, Cornell University. *Robotic Sculpture*

PROFESSIONAL EXPERIENCE

- 2013-2018 **NVIDIA Corporation** *Graphics Research Engineer*
Lead Architect of NVIDIA® GVDB Voxels, a framework for computation, simulation and rendering of voxel-based models with applications to motion pictures, 3D printing and scientific visualization. Developed software, content, videos, marketing and licensing for software release. Guided research collaborations with SpaceX, HP Labs and Dreamworks Animation. <http://developer.nvidia.com/gvdb>
- 2015 **High Fidelity, Inc.** *Conceptual Media Artist*
Invited as a conceptual media artist to imagine new worlds and interaction in virtual reality with Philip Rosedale (Second Life). Based on virtuality in historical fiction, developed a theoretical model and series of practical novel VR experiences entitled Visions of Virtuality. <https://highfidelity.io/>

- 2011 **Medialogy, Department of Art and Architecture** *Assistant Professor*
 Aalborg University at Copenhagen, Denmark
 Developed a research program and curriculum in computer graphics with topics and supervision of masters' students in motion capture, animation and modeling. Led project teams to create media works for the Copenhagen Zoo and Visionday conference.
<http://www.create.aau.dk/>
- 2010-2012 **Transliterations, Department of English** *Project Scientist, Co-Director*
Contact: Professor Alan Liu, University of California Santa Barbara
 Co-director of the Transliterations RoSE project, a Research-oriented Social Environment to create a novel social networking site for contemporary and historic persons in literature. Developed grant materials and lead a team of graduate engineers in collaborations with literary scholars. <http://transliterations.english.ucsb.edu/>
- 2009 **DreamWorks Animation** *R&D Rendering Intern*
Contact: Bruce Tartaglia, Senior Rendering Engineer
 Worked with the R&D Rendering team on new approaches to material rendering based on the MetaSL graph-language. Improved lighting models in production software and developed testing methods in collaboration with Mental Images.
- 2005 **Seattle Library Visualization Project** *Production Lead*
Contact: Professor George Legrady, University of California Santa Barbara
 Lead producer and co-creator of *Making Visible the Invisible*, now the longest continually running interactive media arts project, a ten year project for real-time visualization of library circulation materials exhibited on six 42" plasma displays.. and still running.
- 2001-2004 **Game Design Initiative at Cornell University** *Co-founder, Lecturer*
Contact: Professor David Schwartz, dis@mail.rit.edu, Rochester Institute of Technology
 Co-founder of the Game Design Initiative at Cornell University (GDIAC), introducing the first courses in game design at Cornell. Developed hands-on curricula for interdisciplinary collaboration between students in computer science and fine arts, and created novel software (GameX), to facilitate incremental education in graphics.

COMPUTER GRAPHICS PUBLICATIONS

- 2018 Kui Wu, Nghia Truong, Cem Yuksel, Rama Hoetzlein. Fast Fluid Simulation with Sparse Volumes on the GPU. *Eurographics 2018*. Delft, Netherlands.
- 2018 Hoetzlein, R. GVDB Voxels for 3D Printing, Scientific Data and Motion Pictures. *Vision Day Conference, 2018*. DTU University, Copenhagen, Denmark
- 2016 Hoetzlein, R. GVDB: Raytracing Sparse Voxel Database Structures on the GPU. *High Performance Graphics (HPG), June 2016*. Dublin, Ireland.
- 2016 Hoetzlein, R. Raytracing Scientific Data in NVIDIA® OptiX with GVDB Sparse Volumes. *GPU Technology Conference (GTC), March 2016*. Santa Clara, CA

- 2015 Hoetzlein, R. Data Visualization of the Graphics Pipeline: Tracking State with the Stateviewer. *GPU Technology Conference (GTC), March 2015*. Santa Clara, CA
- 2014 Wyman, Chris, Hoetzlein, R. and Lefohn, A., Frustum-Traced Raster Shadows: Revisiting Irregular Z-Buffers. *Proceedings of the ACM SIGGRAPH Symposium on Interactive 3D Graphics and Games (i3D), 2015*.
- 2014 Hoetzlein, R. Fast Fixed-Radius Nearest Neighbors: Interactive Million Particle-Fluids *GPU Technology Conference, March 2014*. Santa Clara, CA. <http://fluids3.com>
- 2012 Hoetzlein, R. Graphics Performance in Rich Internet Applications. *IEEE Computer Graphics & Applications. Volume 32, Issue 5, pp 98-104. Sept 2012*.
- 2009 Hoetzlein, R. and Höllerer, T. Interactive Water Streams with Sphere Scan Conversion. *ACM Interactive Graphics and Games (i3D), Feb 2009*. Boston, MA.
- 2005 Hoetzlein, R. and Schwartz, D. GameX: A Platform for Incremental Instruction in Computer Graphics and Game Design. *ACM SIGGRAPH Educators Program 2005*.

MEDIA ARTS & HUMANITIES PUBLICATIONS

- 2012 Hoetzlein, R. Visual Communication in Times of Crisis: The Fukushima Nuclear Accident, *Leonardo Journal of Arts, Science and Technology*. April 2012.
- 2012 Eric Chuck, Rama Hoetzlein, David Kim, Julia Panko. Creating Socially Networked Knowledge through Interdisciplinary Collaboration. *Arts & Humanities in Higher Education: An international journal of theory, research and practice*, Vol. 11, No. 1-2. Feb/April 2012.
- 2012 Hoetzlein R. Imagination in Media Arts: Technological Constraints and Creative Freedom. *Ph.D Dissertation, Dec 2011*. University of California Santa Barbara
- 2009 Hoetzlein, R. and D. Adderton, "MINT/VXF: A High-Performance Computing Framework for Interactive Multimedia." *Future of Media Arts, Science and Technology Workshop (MAST), Jan 2009*. University of California Santa Barbara.
- 2009 Hoetzlein, R. Subjective Media: A Historic Context for New Media in Art, *Fourth International Conference on the Arts in Society*. Venice, Italy.
- 2009 Hoetzlein, R. Alternatives to Author-centric Knowledge Organization, *Implementing New Knowledge Environments (INKE 2009)*. Victoria, Canada.
- 2007 M. Turk, T.Höllerer, S.Arisona, J.Kuchera-Morin, C. Coffin, R. Hoetzlein, et al Creative Collaborative Exploration in Multiple Environments *Association for the Advancement of Artificial Intelligence, 2008 Symposium*
- 2007 Hoetzlein, R. The Organization of Human Knowledge: Systems for Interdisciplinary Research. *Master's Thesis*. University of California Santa Barbara

TEACHING EXPERIENCE

2011	Advanced Animation and Motion Capture	Assistant Professor, Aalborg Univ
2011	Computer Graphics and Digital Scenography	Assistant Professor, Aalborg Univ
2008	Introduction to Computer Graphics	Teaching Assistant, UCSB
2006	Introduction to Mechanical Engineer	Teaching Assistant, UCSB
2005	Visual Art Literacy	Teaching Assistant, UCSB
2005	Digital Art Strategies	Teaching Assistant, UCSB
2004	Advanced Topics in Game Design (GDIAC)	Co-founder, Cornell University
2003	First official course in Game Design (GDIAC)	Co-founder, Cornell University

AWARDS & PROFESSIONAL ACTIVITIES

2014	Guest Speaker. KnowViz Workshop	University of California San Diego
2009	Participant. Digital Humanities Institute	University of Victoria, Canada
2007	Participant. Text Encoding Seminar	University of California Santa Barbara
2006	Guest Speaker	Moorpark College Multimedia Festival
2006	Guest Speaker	Digital Arts Research Network
2006	Participant. Digital Humanities Summer Institute	University of Victoria, Canada
2006	Arts Exhibitions Coordinator. ACM Multimedia 2006	Univ. of California Santa Barbara
2006	NSF Interactive Multimedia IGERT Fellowship.	Univ. of California Santa Barbara
2004	Recognition Award for Teaching (GDIAC)	Cornell University
2001	Outstanding Achievement in Contemporary Sculpture	International Sculpture Center
1998	Award for Presentation. Dept. of Physical Chemistry	Bits on Our Minds, Cornell

SELECTED ART EXHIBITIONS

2015	Visions of Virtuality. High Fidelity, Inc.	San Francisco, CA
2011	EcoPlayer. Interactive experience of animal sounds.	Copenhagen, Denmark
2011	Global Units. Procedural modeling for live recorded music.	Copenhagen, Denmark
2010	The Bones of Maria. Generative organic art. The Cultor, IT	Torino, Italy
2009	Presence. Immersive 360° photography	Santa Barbara, CA
2008	Social Evolution. Evolutionary crowd simulation. Version Bêta.	Genève, Switzerland
2007	Lifecycles. 2 nd International Arts & Science Exhibition	Beijing, China
2007	Intelligent Things. Machine Project, DorkBot So. Cal.	Los Angeles, CA
2005	Timewave. Ecological digital microscope. Gallery 1434	Santa Barbara, CA
2004	Collective Morphology. Collaborative generative forms.	Santa Barbara, CA
2001	Creatures. Mechanical and Robotic Sculpture.	Ithaca, NY
1999	Gigaspaces. Crowd interaction with a virtual pixelated dog	Ithaca, NY

VIDEO AND WORKS ONLINE

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