https://n3m0.org/~cdonner

Curriculum Vitae

Craig Donner

cdonner@n3m0.org

Education

UNIVERSITY OF CALIFORNIA, SAN DIEGO — September 1997 - September 2006

Ph.D. in Computer Science, 2006
Research Area: Computer Graphics
Advisor: Henrik Wann Jensen
Dissertation: "Towards Realistic Image Synthesis of Scattering Materials"
M.S. in Computer Science, 2004
B.S. in Computer Engineering, 2001 (*magna cum laude*)

Experience

GOOGLE — December 2016 - Present

Senior Staff Software Engineer
Engineering Lead for VR platforms and system software, particularly Daydream. Helped found OpenXR effort, led development on new VR devices and form-factors, unified multiple VR-related platform software efforts, designed and implemented foundational features in Android OS.

GOOGLE — June 2015 - November 2016

Staff Software Engineer
Engineering Lead for VR platforms and system software, including Google Cardboard, Daydream, VR-related implementations in Android OS. Working with external parters to create Daydream-ready devices, including Samsung, Huawei, LG, Motorola, ASUS, Qualcomm, ARM, and others.

GOOGLE — June 2014 - May 2015

Senior Software Engineer
Engineer on Google Earth, founding part of Google Cardboard team, lead Google VR SDK engineer with multiple public release in Java and C++.

GOOGLE — October 2012 - May 2014

Software Engineer
Engineer on Google Earth, developing rendering techniques, extending Google infrastructure to support poly-platform products, led effort for unifying rendering engines of Google Earth, Google Maps, and Google StreetView, started Project Ion.

LEOLUX — September 2009 - September 2012

Principal Research Scientist
Research coupling computer graphics and biology focused on advanced appearance modeling, appearance acquisition, and biological modeling. Designing custom software to client's specifications, including simulation tools, user interfaces, and other technical packages.

COLUMBIA UNIVERSITY — October 2007 - September 2009

Postdoctoral Research Scientist, Department of Computer Science
Host: Ravi Ramamoorthi
Research in computer graphics focused on advanced appearance modeling, measurement techniques, complex light transport, and global illumination.

UNIVERSITY OF CALIFORNIA, SAN DIEGO — September 2006 - September 2007

Postdoctoral Researcher, Department of Computer Science and Engineering
Host: Henrik Wann Jensen
Research in computer graphics focused on appearance modeling, complex light transport, and global illumination.

WETA DIGITAL LTD. November 2006

Consultant, Shaders and Rendering Group

Development and implementation of advanced shading techniques for materials such as skin and leaves. Results used in the movie *Avatar*.

UNIVERSITY OF CALIFORNIA, SAN DIEGO October 2002 - September 2006

Graduate Student Researcher, Department of Computer Science and Engineering

Assisted in the design and construction of the Graphics and Vision Lab. Performed research in the areas of interactive full global illumination rendering, appearance modeling, and light transport simulation. Administrator of Linux and Windows machines, including multi-node clusters.

CALIT^2 June - September 2003

Graduate Student Researcher, Center for Research in Computing and the Arts

Implemented high-end content creation tools for the creation of a digital immersive environment.

SAN DIEGO SUPERCOMPUTER CENTER June 1999 - June 2003

Graduate Student Researcher, Visualization Lab

Assisted in the design and construction of a tiled display, developed tools for display super high-resolution images and movies.

SHELDON BROWN, INC. July 2001 - April 2002

Lead Programmer

Designed and implemented an immersive 3D environment engine, and design tools for content production. Project is currently on display at the Ruben H. Fleet Science Center in San Diego's Balboa Park.

SAN DIEGO SUPERCOMPUTER CENTER June 1999 - July 2000

Undergraduate Student Researcher, Visualization Lab

Developed drivers for 3D input devices, designed and implemented a parallel visualization tools.

KNOWLEDGE ADVENTURE/DAVIDSON & ASSOC. June - August 1998

Lead Programmer

Lead development of an educational software package for children.

Research Interests

My core focus is on computer graphics rendering [3,5,7,11,13] and appearance modeling [1,6,9,10,12], developing algorithmic models that succinctly describe the appearance of the natural world. Real-world materials, like milk, hair, and skin, scatter light within their volume. Simulating this complex interaction has a high computational cost, thus efficient models are necessary. These models are useful not only for generating realistic imagery, but also for medical diagnosis [1,2], studies on appearance (e.g. health, beauty, age of skin) [3,9], and for investigating the optical properties of materials [1,5,6,8,14,15].

Honors and Awards

- Proceedings Front Cover Image, *SIGGRAPH Asia*, 2010
- Proceedings Front Cover Image, *SIGGRAPH Asia*, 2008
- Proceedings Front Cover Image, *Graphics Hardware*, 2003
- Best Paper of Conference Award, *Graphics Hardware*, 2003

Peer-Reviewed Journal Articles

[1] **C. Donner** and H. W. Jensen. *Rapid simulation of steady-state spatially-resolved reflectance and transmittance profiles of multi-layered turbid materials. J. Opt. Soc. Am. A*, 23(6):1382–1390, 2006

[2] N. Joshi, **C. Donner**, and H. W. Jensen. *Noninvasive measurement of scattering anisotropy in turbid materials by nonnormal incident illumination. Opt. Lett.*, 31:936–938, 2006

SIGGRAPH/ToG Papers

[3] J. Jimenez, T. Scully, N. Barbosa, **C. Donner**, X. Alvarez, T. Vieira, P. Matts, V. Orvalho, D. Gutierrez, T. Weyrich. *A practical appearance model for dynamic facial color. ACM Trans. Graphic.* (Proceedings of SIGGRAPH Asia 2010), 29(6):141:1–10, 2010
(Proceedings front cover)

[4] R. Overbeck, **C. Donner**, R. Ramamoorthi. *Adaptive wavelet rendering. ACM Trans. Graphic.* (Proceedings of SIGGRAPH Asia 2009), 28(5):140:1–12, 2009

[5] **C. Donner**, J. Lawerence, T. Hachisuka, H. W. Jensen, S. Nayar, R. Ramamoorthi *An Empirical BSSDF Model*, conditionally accepted to *ACM Trans. Graphic.* (Proceedings of SIGGRAPH 2009), 28(3), 2009

[6] **C. Donner**, T. Weyrich, E. d'Eon, S. Rusinkiewicz, and R. Ramamoorthi. *A layered, heterogeneous reflectance model for acquiring and rendering human skin. ACM Trans. Graphic.* (Proceedings of SIGGRAPH Asia 2008), 27(5):140:1–12, 2008
(Proceedings front cover)

[7] W. Jarosz, **C. Donner**, M. Zwicker, and H. W. Jensen. *Radiance Caching for Participating Media. ACM Trans. Graphic.*, 27(1):1–11, 2008

[8] S. G. Narasimhan, M. Gupta, **C. Donner**, R. Ramamoorthi, S. Nayar, and H. W. Jensen. *Acquiring scattering properties of participating media by dilution. ACM Trans. Graphic.* (Proceedings of SIGGRAPH 2006), 25:1003–1012, 2006

[9] T. Weyrich, W. Matusik, H. Pfister, B. Bickel, **C. Donner**, C. Tu, J. McAndless, J. Lee, A. Ngan, H. W. Jensen, and M. Gross. *Analysis of human faces using a measurement-based skin reflectance model. ACM Trans. Graphic.* (Proceedings of SIGGRAPH 2006), 25:1013–1024, 2006

[10] **C. Donner** and H. W. Jensen. *Light diffusion in multi-layered translucent materials. ACM Trans. Graphic.* (Proceedings of SIGGRAPH 2005), 24(3):1032–1039, 2005

Peer-Reviewed Conference Papers

[11] **C. Donner** and H. W. Jensen. *Rendering translucent materials using photon diffusion.* In *Rendering Techniques (Proceedings of the Eurographics Symposium on Rendering)*, pages 243–251, 2007

[12] **C. Donner** and H. W. Jensen. *A spectral BSSRDF for shading human skin.* In *Rendering Techniques (Proceedings of the Eurographics Symposium on Rendering)*, pages 409–417, 2006

[13] T. J. Purcell, **C. Donner**, M. Cammarano, H. W. Jensen, and P. Hanrahan. *Photon mapping on programmable graphics hardware.* In *Graphics Hardware*, pages 41–50, 2003
(Proceedings front cover and awarded best paper of conference)

Other Publications

[14] W. Jarosz, **C. Donner**, M. Zwicker, and H. W. Jensen. *Radiance Caching for Participating Media.* In *ACM SIGGRAPH Sketches and Applications*, 2007

[15] **C. Donner**. *Towards Realistic Image Synthesis of Scattering Materials.* Ph.D. Dissertation, University of California at San Diego, 2006

[16] **C. Donner** and H. W. Jensen. *A spectral shading model for human skin.* In *ACM SIGGRAPH Sketches and Applications*, 2006

[17] B. Bickel, T. Weyrich, W. Matusik, H. Pfister, **C. Donner**, C. Tu, J. McAndless, J. Lee, A. Ngan, H. W. Jensen, and M. Gross. *Processing and editing of faces using a measurement-based skin reflectance model. ACM SIGGRAPH Sketches and Applications*, 2006

[18] **C. Donner**. *Photon mapping methods on programmable graphics hardware.* Master's thesis, University of California at San Diego, 2004

[19] **C. Donner** and H. W. Jensen. *Faster GPU computations using adaptive refinement.* In *ACM SIGGRAPH Sketches and Applications*, 2004

Teaching

ACM SIGGRAPH

SIGGRAPH 2009 Course, *Scattering*: Instructor
SIGGRAPH 2008 Course, *Advanced Global Illumination*: Guest Instructor

UNIVERSITY OF CALIFORNIA, SAN DIEGO

CSE 168, *Rendering Algorithms*, Spring 2004: Teaching Assistant/Lecturer
CSE 167, *Introduction to Computer Graphics*, Fall 2003: Teaching Assistant/Lecturer
CSE 190B, *Advanced Topics in Computer Science*, Spring 2002: Teaching Assistant/Lecturer
CSE 167, *Introduction to Computer Graphics*, Spring 2001: Teaching Assistant
CSE 167, *Introduction to Computer Graphics*, Spring 2000: Teaching Assistant
CSE 30, *Computer Architecture*, Fall 1998: Tutor/Teaching Assistant

Professional Activities

Technical Papers Committee Member: Eurographics Symposium on Rendering 2008, 2009, 2010, 2012, Eurographics 2012.

Reviewer: ACM SIGGRAPH, ACM Journal of Graphics Tools, ACM Transactions on Graphics, Computer Graphics Forum, Eurographics, Eurographics Symposium on Rendering, IEEE Transactions on Visualization and Computer Graphics, IEEE Computer Graphics and Applications, Journal of the Optical Society of America A, Optics Express, Optics Letters, Applied Optics.

Academic References

Henrik Wann Jensen
Department of Computer Science and Engineering
University of California, San Diego
La Jolla, CA
email: henrik@cs.ucsd.edu

Ravi Ramamoorthi
Department of Computer Science and Engineering
University of California, San Diego
La Jolla, CA
email: ravir@cs.ucsd.edu

Tim Weyrich
Department of Computer Science
University College London
London, UK
email: t.weyrich@ucl.ac.uk

Abhijeet Ghosh
Department of Computing
Imperial College London
London, UK
email: ghosh@imperial.ac.uk