

WOJCIECH JAROSZ

Associate Professor of Computer Science



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Academic Appointments

Associate Professor July 2020 – Present
Assistant Professor July 2015 – June 2020
Dartmouth College Hanover, NH, USA
 Department of Computer Science

Research Interests

My research is concerned with deriving *theoretical models* and developing *computational algorithms* for efficiently capturing, simulating, manipulating, and physically realizing complex visual appearance. In effect, I strive to understand why things look the way they do, how we can simulate their interaction with light efficiently, how we can intuitively author or edit that appearance, and how we can create physical objects with control over their appearance. My publications explore practical applications in several overlapping areas in computer graphics including: participating media rendering, appearance editing & stylization, complex illumination and materials, global illumination, Monte Carlo methods and efficient sampling, high-dynamic range imaging; and computational materials and displays.

Education

Ph.D. in Computer Science Aug. 2003 – Sep. 2008
M.S. in Computer Science March 2006
University of California, San Diego
 Advisors: Henrik Wann Jensen & Matthias Zwicker
 Efficient Monte Carlo Methods for Light Transport in Scattering Media
B.S. in Computer Science May 2003
University of Illinois, Urbana–Champaign
 Highest Honors
 Advisors: John C. Hart & Michael Garland
 Interactive Global Illumination for Improved Lighting Design Workflow

Employment History

Sr. Research Scientist Jan. 2014 – Jun. 2015
Research Scientist Sep. 2010 – Dec. 2013
Post-Doc March 2009 – Sep. 2010
Disney Research Zürich, Switzerland
 Head of Rendering Group
 The Walt Disney Company (Switzerland) GmbH
 Supervisor: Markus Gross
Adjunct Lecturer August 2009 – June 2015
ETH Zürich Zürich, Switzerland
 Department of Computer Science
Post-Doc Oct. 2008 – Feb. 2009
University of California, San Diego
 Department of Computer Science & Engineering
 Supervisor: Henrik Wann Jensen
Research Intern Summer 2008
Adobe Software Systems San Jose, CA
 Advanced Technology Labs
 Supervisor: Nathan Carr
Research Intern Summers of 2003, 2005, 2006
Industrial Light & Magic San Francisco, CA
 R&D Group
 Supervisor: Florian Kainz
Student Researcher June 2001 – June 2003
University of Illinois, Urbana–Champaign
 Department of Computer Science
 Supervisor: John C. Hart

Honors & Awards



National Science Foundation CAREER Award 2019

Awarded to ~100 junior computer science faculty/year. The NSF's most prestigious awards in support of junior faculty who exemplify the role of teacher-scholars through outstanding research, excellent education and the integration of education and research.

Eurographics Young Researcher Award 2013

The most prestigious early career award for European researchers in computer graphics: "given each year to two young researchers in the field who have already made a significant contribution. The intent of this award is to recognize people early on in their career who have already made a notable contribution and are likely to make more." See dartgo.org/jarosz-eg-award.

C. Troy Shaver 1969 Fellowship 2020-2021

Dartmouth College

Dartmouth Junior Faculty Fellowship 2019

Pacific Graphics Best Paper Award 2015

For the paper [J31]: "Dispersion-based Color Projection using Masked Prisms", 2015.

UCSD Rendering Competition, 1st Place 2004

Won a trip to SIGGRAPH 2004 for rendering a realistic scene using a personally-written renderer for CSE 168.

UIUC Dean's List Fall 1999 – Spring 2003

Karen E. Wetterhahn Memorial Award 2020-2021

for Distinguished Creative or Scholarly Achievement

Dartmouth College

Computer Graphics Forum Cover Images 2015, 2017

Winning images are used on the cover of *Computer Graphics Forum* journal for the duration of the year. Co-authors of the 2015 image are J. Křivánek, M. Sik, I. Georgiev, T. Hachisuka, P. Vevoda, D. Nowrouzezahrai and W. Jarosz. Co-authors of the 2017 image are A. Marra, M. Nitti, M. Papas, T. Müller, M. Gross, W. Jarosz and J. Novák.







CRA Outstanding Undergraduate Award 2003

Honorable Mention







Funding



Current funding

- \$ National Science Foundation, CAREER. (\$550K), Sole-PI.  July 2019–June 2024
Automatic and general light transport algorithms for use by humans and machines
- \$ National Science Foundation, Information and Intelligent Systems. (\$495K), Sole-PI.  August 2018–July 2021
Higher-Order Monte Carlo Samples for Computer Graphics Rendering
- \$ Autodesk/Solid Angle Corp. Unrestricted Gift. (\$195K), Sole-PI.  2017, 2018, 2019, 2020
- \$ Neukom Institute CompX Faculty Grant. (compute cluster resources). Sole-PI.  2020
Computational appearance matching of translucent materials
- \$ NVIDIA Corp. Unrestricted Gift. (\$25K), Sole-PI.  2020
- \$ Burke Award. (\$25K), Sole-PI.  2015–2021

Past funding

- \$ Activision Corp. Unrestricted Gift. (\$45K), Sole-PI.  2017, 2018, 2019
- \$ NVIDIA Corp. Hardware donation for CS 87/187 rendering competition grand prize (\$2,500 value).  2019
- \$ Microsoft Corp. Azure Research Award. (\$20K), Sole-PI.  September 2017–September 2018
- \$ Dartmouth CS Department Equipment Grant. (\$14K), Co-PI with Devin Balkcom.  2017
ABB Robotics - IRB 120 multipurpose industrial robot arm
- \$ Microsoft Corp. HoloLens Research Grant. (\$100K), Co-PI with Emily Cooper and Xing-Dong Yang.  2016–2017
Augmenting Reality for the Visually Impaired
- \$ NVIDIA Corp. Hardware gift.  October 2017

Research Impact



OpenEXR

openexr.org

I designed and implemented tiled/multi-resolution image support as well as multi-threading in the OpenEXR high-dynamic range image format and library while working at Industrial Light & Magic. The work was funded by a grant from The Academy of Motion Picture Arts and Sciences. These features were first used in *Star Wars Episode III: Revenge of the Sith* and have since been adopted by all major film renderers (RenderMan, Arnold, etc.) and commercial image editing packages (Photoshop, etc.). OpenEXR is now the de-facto standard high-dynamic range image file format for professional film production, having been used in hundreds of films.

Technical Oscar

dartgo.org/openexr-oscar

My contributions to OpenEXR were recognized in an Academy Award of Technical Achievement in 2007, awarded to Florian Kainz: “Widely adopted, OpenEXR is engineered to meet the requirements of the visual effects industry by providing for lossless and lossy compression of tiered and tiled images.”

Rendering Software

My research has been incorporated into commercial, proprietary and open-source rendering tools.

- 💡 **Pixar’s RenderMan** renderman.pixar.com
Hierarchical sample warping [J67] for importance sampling environment maps, photon beams [J58], residual ratio tracking [J39] and unified points, beams & paths [J40] for participating media, and photon beam diffusion [J45] for subsurface scattering have all been incorporated into RenderMan.
- 💡 **Disney’s Hyperion** dartgo.org/hyperion
Residual ratio tracking [J39] for participating media has also been incorporated into Disney’s proprietary renderer *Hyperion* – used to produce all of Disney’s animated films since *Big Hero 6*.
- 💡 **PBRT** pbrt.org
Several of the techniques developed in my research (including photon beam diffusion [J45] and residual ratio tracking [J39]) have been incorporated into the open-source *PBRT* rendering system, which is a standard rendering framework used in hundreds of academic publications.
- 💡 **RADIANCE** radiance-online.org
Our Hessian-based irradiance caching technique [J47] is part of the *Radiance* architectural lighting simulation system.

Movie Credits

dartgo.org/jarosz-imdb

I have worked on, and been credited in a number of feature films for my contributions to computer graphics research.

- 🎬 **Big Hero 6** 📅 2014
“Senior Research Scientist (Disney Research)”
For co-developing (with Jan Novák and Andrew Selle) the residual ratio tracking technique [J39] used to render the fog, clouds, and other volumetric effects throughout the film.
- 🎬 **Planes: Fire & Rescue** 📅 2014
“Research Scientist (Disney Research)”
For contributing (with Dr. Ralf Habel) a method for artist-tunable but physically based, secondary motion of trees.
- 🎬 **Frozen** 📅 2013
“Research Scientist (Disney Research)”
While researching the appearance of granular materials [J32], we took measurements (along with Dr. Marios Papas & Dr. Ralf Habel) of real snow using our custom capture device [J44], leading to the improved realism of all snow and ice in the film.
- 🎬 **Tangled** 📅 2010
“Research Scientist (Research)”
For co-developing (with Andrew Selle, Dylan Lacewell, and Jared Johnson) the artistic volumetric lighting system [J55] used for two shots in the film, including the climactic revival sequence.

Supervision



Current Ph.D. Students (👤)

- 👤 Katherine Salesin, PhD 📅 2018–Present
- 👤 Dario Seyb, PhD 📅 2018–Present
- 👤 Shaojie Jiao, PhD 📅 2018–Present
- 👤 Zack Misso, PhD 📅 2017–Present
- 🏆 Facebook PhD Fellowship awardee (2020-2022)
- 👤 Benedikt Bitterli, PhD 📅 2016–Present
- 🏆 NVIDIA Graduate Fellowship awardee (2020-2021)

Other Ph.D. Dissertation Committees

- 👤 Iliyan Georgiev, PhD (Saarland University) 📅 2015
📄 *Path Sampling Techniques for Efficient Light Transport Simulation*
- 👤 Jan Novák, PhD (Karlsruhe Institute of Technology) 📅 2014

Past Ph.D. Students (👤) and Postdocs (👤)

- 👤 Srinath Ravichandran, PhD (now @ SideFx) 📅 2015–2017
- 👤 Nicolas Vibert, visiting PhD from McGill 📅 Fall 2017
- 👤 Yuan Tian, PhD 📅 2015–2016
- 👤 Gurprit Singh, Postdoc (now @ MPI) 📅 2015–2017
- 👤 Marios Papas, PhD (now @ Disney Research) 📅 2011–2016
📄 *A computational appearance fabrication framework, and derived applications*
- 👤 Romain Prévost, PhD 📅 2013–2016
📄 *Physics-based optimization for assisted creation of tangible artifacts*
- 👤 Fabrice Rousselle, Postdoc (now @ NVIDIA Research) 📅 2014–2015
- 👤 Jan Novák, Postdoc (now @ NVIDIA Research) 📅 2014–2015
- 👤 Ralf Habel, Postdoc (now @ Disney Animation) 📅 2012–2014
- 👤 Derek Nowrouzezahrai, Postdoc (now Prof. @ McGill) 📅 2010–2011

- 📅 *Efficient Many-Light Rendering of Scenes with Participating Media*
- 👤 Laurent Belcour, PhD (Université de Grenoble) 📅 2012
- 📅 *A Frequency Analysis of Light Transport*
- 👤 Adolfo Muñoz, PhD (Universidad de Zaragoza) 📅 2010
- 📅 *Light Transport in Participating Media*

Bachelor Theses/Projects (👤)

- 👤 Tanli Su 📅 2021–Present
- 👤 Aidan Low 📅 2021–Present
- 👤 Yusuf Olokoba 📅 2019–2020
- 📅 *Deep Bilateral Exposure Fusion*
- 👤 Neerja Thakkar 📅 2018–2019
- 📅 *Rendering for Depth: A Dataset and Analysis of Physically-Based Rendering Algorithms for Training Monocular Depth Prediction*
- 👤 Afnan Enayet 📅 2018–2019
- 📅 *Orthogonal Array Sampling for Monte Carlo Based Rendering*
- 👤 Bailey Miller 📅 2017–2018
- 📅 *A Null Path Integral Formulation for Volumetric Rendering of Heterogeneous, Spectral Media*
- 👤 George J. Hito 📅 2017–2018
- 📅 *Overlaying Virtual Scale Models on Real Environments Without the Use of Peripherals*
- 👤 Jonathan Huang 📅 2016–2017
- 📅 *A HoloLens Application to Aid People who are Visually Impaired in Navigation Tasks*
- 👤 Simon Kallweit 📅 2013
- 📅 *Photon Beam Methods in Rendering*
- 👤 Benedikt Bitterli 📅 2012–2013
- 📅 *BSSRDF Explorer: A Rendering Framework for the BSSRDF*
- 👤 Jakob Progsch 📅 2012–2013
- 📅 *BRDF Fitting using Nonlinear Optimization Methods*
- 👤 Sebastien Millius 📅 2011
- 📅 *Fabrication Method Analysis for Goal-Based Caustics Surfaces*
- 👤 Adrian Blumer 📅 2011
- 📅 *Visibility Silhouette Level-of-Detail*

Interns (👤)

- 👤 Adrian Blumer 📅 Fall 2014
- 👤 David Koerner 📅 Fall 2014
- 👤 Hugo Loi 📅 Summer 2014
- 👤 Oliver Klehm 📅 Summer 2014
- 👤 Rafael Hostettler 📅 Summer 2014
- 👤 Simon Kallweit 📅 Summer 2014
- 👤 Benedikt Bitterli 📅 2014
- 👤 Shuoran Yang 📅 2014
- 👤 Károly Zsolnai 📅 Summer 2013
- 👤 Johannes Meng (now @ Weta Digital) 📅 Summers 2012, 2013
- 👤 Iliyan Georgiev (now @ Solid Angle) 📅 Summer 2012
- 👤 Jan Novák (now @ Disney Research) 📅 Summers 2011, 2012
- 👤 Wenzel Jakob (now Prof. @ EPFL) 📅 2010 – 2011
- 👤 Robert Thomas 📅 Summer 2010
- 👤 Marios Papas (now @ Disney Research) 📅 Summer 2010
- 👤 Jared M. Johnson (now @ Google) 📅 Summer 2010
- 👤 Derek Nowourzezahrai (now Prof. @ McGill) 📅 Summer 2009

- 👤 Christian Regg, PhD 📅 2010–2011

Ph.D. Habilitation Committees

- 👤 Cyril Soler (Université de Grenoble) 📅 June 2014
- 📅 *Models and Analyses for Image Synthesis*

Masters Theses (👤+)

- 👤+ Eammon Littler 📅 2021–Present
- 👤+ Yang Liu 📅 2021–Present
- 👤+ Yang Qi 📅 2021–Present
- 👤+ Hsu (Carter) Chen 📅 2020–Present
- 👤+ Hannes Hergeth, visiting M.S. from Aachen 📅 2019
- 📅 *Higher Dimensional Photon Primitives for Surface Illumination*
- 👤+ Annie Dai 📅 2018–2019
- 📅 *Computational Fabrication - String Art*
- 👤+ Xi Deng 📅 2017–2019
- 📅 *Photon Surfaces: Rendering volume robustly with unbiased density estimators*
- 👤+ Shaojie Jiao 📅 2017–2018
- 📅 *Photon Surfaces: Volumetric light transport using multiple importance sampled 2D photon samples*
- 👤+ Thomas Müller 📅 2015–2016
- 📅 *Modeling and Rendering Heterogeneous Granular Materials*
- 👤+ Benedikt Bitterli 📅 2015
- 📅 *Informed Choices in Primary Sample Space*
- 👤+ Adrian Blumer 📅 2013–2014
- 📅 *Modular Radiance Transfer for Trees*
- 👤+ Romain Prévost 📅 2012–2013
- 📅 *A Multi-Layering Framework for Raytraced Diffusion Curves*
- 👤+ Jorge Schwarzhaupt (now @ Weta Digital) 📅 2011–2012
- 📅 *Occlusion-Aware Hessians for Error Control in Irradiance Caching*
- 👤+ Marina Späni 📅 2011–2012
- 📅 *Rendering Dynamic Objects in Dynamic Environments*
- 👤+ Thomas Houit 📅 2011–2012
- 📅 *The Magic Lens: Refractive Steganography*
- 👤+ Thomas Siegrist 📅 2011–2012
- 📅 *Stereoscopic Perception of Material Reflectance*
- 👤+ Michael Morandi 📅 2011–2012
- 📅 *Directional Occlusion Volumes*
- 👤+ Philipp Keller 📅 2011
- 📅 *Manufacturing Layered Attenuators for Multiple Prescribed Shadow Images*
- 👤+ Silvan Tschoop 📅 2011
- 📅 *Facial Performance Appearance Capture and Rendering*
- 👤+ Stefan Geiger 📅 2010–2011
- 📅 *An Immersive 3D Augmented Reality Lens*
- 👤+ Benjamin Müller 📅 2010–2011
- 📅 *Analytic Lighting in the Presence of Participating Media*
- 👤+ Pascal Goffin 📅 2009–2010
- 📅 *Fast Ray Tracing of Line Primitives*

Teaching



- Professor, Department of Computer Science, Dartmouth College** 📅 Fall 2015 – Present
- COSC 1: Introduction to Programming and Computation 📅 Spring 2021
 - COSC 70 (previously COSC 11): Foundations of Applied Computer Science 📅 Winter 2021; Spring 2020; Winter 2019
 - COSC 77/277: Computer Graphics 📅 Winter 2020; Fall 2018, 2017, 2016
 - COSC 73/273 (previously COSC 89/189): Computational Aspects of Digital Photography 📅 Fall 2020; Winter 2018; Fall 2015
 - COSC 87/287: Rendering Algorithms 📅 Fall 2019; Spring 2018, 2017, 2016

- Lecturer, Department of Computer Science, ETH Zürich, Switzerland** 📅 Fall 2009 – Spring 2015
- 252-5705-00G: Image Synthesis (2015: with Wenzel Jakob) 📅 Spring 2012, 2013, 2014, 2015
 - 252-0543-01L: Computer Graphics (2009: with Alex Hornung, 2010: with Alex Hornung & Ilya Baran) 📅 Fall 2009, 2010

- Teaching Assistant, Dept. of Computer Science & Engineering, UC San Diego** 📅 Fall 2005 – Spring 2008
- CSE 168: Rendering Algorithms (teaching assistant, guest lecturer) 📅 Spring 2005, 2006, 2007, 2008
 - CSE 169: Computer Animation (teaching assistant) 📅 Winter 2006
 - CSE 167: Introduction to Computer Graphics (teaching assistant) 📅 Fall 2005

Publications



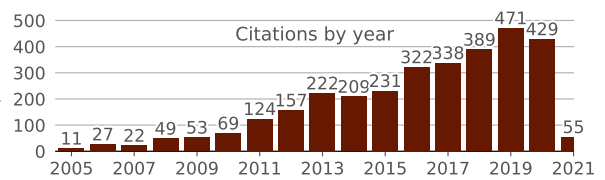
🌟 **Publication Impact: total citations: 3,226**

***h*-index: 35; *i*100-index: 7; *i*10-index: 65**

h-index = largest number *h* such that *h* publications have at least *h* citations.

iN-index = number of publications with at least *N* citations.

Citation statistics according to Google Scholar as of March 2021.



Below you can find a list of my academic publications and patents (separated by type and sorted by year), along with links to accompanying [🌐](#) project pages, direct [📄](#) PDF downloads, and approximate [📊](#) citation counts scraped from my Google Scholar **profile**.

Bold underline author: **Self**.

Bold authors with superscripts: **Postdoc^{PD}, PhD^{PhD}, MS^{MS}, BS^{BS}**, and **intern^I** advisees. **SIGGRAPH** publications also in bold.

📄 Peer-Reviewed Journal Articles

































- [J1] **B. Bitterli^{PhD}**, C. Wyman, M. Pharr, P. Shirley, A. Lefohn, and **W. Jarosz**. “Spatiotemporal reservoir resampling for real-time ray tracing with dynamic direct lighting”. In: ***ACM Transactions on Graphics (Proceedings of SIGGRAPH)*** 39.4 (July 2020). DOI: 10 / gg8xc7. [🌐](#) webpage, [📄](#) pdf, [📊](#) citations: 1.
- [J2] **D. Seyb^{PhD}**, P.-P. Sloan, A. Silvenoinen, M. Iwanicki, and **W. Jarosz**. “The design and evolution of the UberBake light baking system”. In: ***ACM Transactions on Graphics (Proceedings of SIGGRAPH)*** 39.4 (July 2020). DOI: 10 / gg8xc9. [🌐](#) webpage, [📄](#) pdf, [📊](#) citations: 1.
- [J3] **B. Bitterli^{PhD}** and **W. Jarosz**. “Selectively Metropolised Monte Carlo light transport simulation”. In: ***ACM Transactions on Graphics (Proceedings of SIGGRAPH Asia)*** 38.6 (Nov. 2019). DOI: 10 / dffp. [🌐](#) webpage, [📄](#) pdf, [📊](#) citations: 8.

📖 Edited Issues & Volumes






























- [E1] **W. Jarosz** and P. Peers, eds. *Proceedings of the Eurographics Symposium on Rendering 2014*. Vol. 33. Computer Graphics Forum 4. June 2014.
- [E2] D. Gutierrez and **W. Jarosz**, eds. *Scattering: Acquisition, Modeling, and Rendering*. Vol. 33. IEEE Computer Graphics and Applications 3. Los Alamitos, CA, USA: IEEE Computer Society, May 2013. DOI: 10.1109/MCG.2013.46.

🎓 Theses

- [T1] **W. Jarosz**. “Efficient Monte Carlo Methods for Light Transport in Scattering Media”. PhD thesis. La Jolla, CA, USA: UC San Diego, Sept. 2008. ISBN: 978-0-549-72071-3. [📊](#) citations: 69.
- [T2] **W. Jarosz**. “Interactive Global Illumination for Improved Lighting Design Workflow”. Bachelors thesis. University of Illinois, Urbana–Champaign, Jan. 2002. [🌐](#) webpage, [📄](#) pdf.





- [J4] I. Georgiev, **Z. Misso**^{PhD}, T. Hachisuka, D. Nowrouzezahrai, J. Křivánek, and **W. Jarosz**. “Integral formulations of volumetric transmittance”. In: *ACM Transactions on Graphics (Proceedings of SIGGRAPH Asia)* 38.6 (Nov. 2019). DOI: 10 / dffn.  webpage,  pdf,  citations: 5.
- [J5] **D. Seyb**^{PhD}, A. Jacobson, D. Nowrouzezahrai, and **W. Jarosz**. “Non-linear sphere tracing for rendering deformed signed distance fields”. In: *ACM Transactions on Graphics (Proceedings of SIGGRAPH Asia)* 38.6 (Nov. 2019). DOI: 10 / dffm.  webpage,  pdf,  citations: 6.
- [J6] J. Marco, I. Guillén, **W. Jarosz**, D. Gutierrez, and A. Jarabo. “Progressive transient photon beams”. In: *Computer Graphics Forum* 38.6 (Sept. 2019), pp. 19–30. DOI: 10/gfvr9w.  webpage,  pdf,  citations: 10.
- [J7] **X. Deng**^{MS}, **S. Jiao**^{PhD}, **B. Bitterli**^{PhD}, and **W. Jarosz**. “Photon surfaces for robust, unbiased volumetric density estimation”. In: *ACM Transactions on Graphics (Proceedings of SIGGRAPH)* 38.4 (July 2019). ISSN: 0730-0301. DOI: 10 / gf6rx9.  webpage,  pdf,  citations: 6.
- [J8] **W. Jarosz**, **A. Enayet**^{BS}, A. Kensler, C. Kilpatrick, and P. Christensen. “Orthogonal array sampling for Monte Carlo rendering”. In: *Computer Graphics Forum (Proceedings of EGSR)* 38.4 (July 2019), pp. 135–147. DOI: 10/gf6rx5.  webpage,  pdf,  citations: 5.
- [J9] **B. Miller**^{BS}, I. Georgiev, and **W. Jarosz**. “A null-scattering path integral formulation of light transport”. In: *ACM Transactions on Graphics (Proceedings of SIGGRAPH)* 38.4 (July 2019). ISSN: 0730-0301. DOI: 10/gf6rzb.  webpage,  pdf,  citations: 4.
- [J10] **K. Salesin**^{PhD} and **W. Jarosz**. “Combining point and line samples for direct illumination”. In: *Computer Graphics Forum (Proceedings of EGSR)* 38.4 (July 2019), pp. 159–169. DOI: 10/gf6rx6.  webpage,  pdf.
- [J11] N. Vibert, A. Gruson, H. Stokholm, T. Mortensen, **W. Jarosz**, T. Hachisuka, and D. Nowrouzezahrai. “Scalable virtual ray lights rendering for participating media”. In: *Computer Graphics Forum (Proceedings of EGSR)* 38.4 (July 2019), pp. 57–65. DOI: 10/gf6rx7.  webpage,  pdf,  citations: 1.
- [J12] G. Singh, C. Öztireli, A. G. Ahmed, D. Coeurjolly, K. Subr, O. Deussen, V. Ostromoukhov, R. Ramamoorthi, and **W. Jarosz**. “Analysis of sample correlations for Monte Carlo rendering”. In: *Computer Graphics Forum (Proceedings of Eurographics - State of the Art Reports)* 38.2 (May 2019), pp. 473–491. ISSN: 1467-8659. DOI: 10/gf6rzc.  webpage,  pdf,  citations: 4.
- [J13] G. Singh, K. Subr, D. Coeurjolly, V. Ostromoukhov, and **W. Jarosz**. “Fourier analysis of correlated Monte Carlo importance sampling”. In: *Computer Graphics Forum* 38.1 (Apr. 2019). DOI: 10 / gfznc.  webpage,  pdf,  citations: 5.
- [J14] **J. Huang**^{BS}, M. Kinatder, M. J. Dunn, **W. Jarosz**, X.-D. Yang, and E. A. Cooper. “An augmented reality sign-reading assistant for users with reduced vision”. In: *PLOS ONE* 14.1 (Jan. 2019), pp. 1–9. DOI: 10/gfznd2.  webpage,  pdf,  citations: 20.

Peer-Reviewed Conference Papers

- [P1] A. Dubouchet, P.-P. Sloan, **W. Jarosz**, and D. Nowrouzezahrai. “Impulse responses for precomputing light from volumetric media”. In: *Proceedings of the Eurographics Symposium on Rendering (EGSR)*. The Eurographics Association, July 2019. DOI: 10/gf6rx8.  webpage,  pdf.
- [P2] L. Maguire, **M. Papis**^{PhD}, **W. Jarosz**, P. Fox, G. Dicoski, and M. Olivares. “The modelling of caustics to produce a projection image”. In: *Optical Security Documents Conference*. Jan. 2018.  webpage,  pdf.
- [P3] M. Mara, M. McGuire, **B. Bitterli**^{PhD}, and **W. Jarosz**. “An Efficient Denoising Algorithm for Global Illumination”. In: *Proceedings of High Performance Graphics*. Los Angeles, California, USA: ACM, July 2017. ISBN: 978-1-4503-5101-0. DOI: 10/gfzndq.  webpage,  pdf,  citations: 41.
- [P4] T. Hachisuka, I. Georgiev, **W. Jarosz**, J. Křivánek, and D. Nowrouzezahrai. “Extended Path Integral Formulation for Volumetric Transport”. In: *Proceedings of EGSR (Experimental Ideas & Implementations)*. The Eurographics Association, June 2017. DOI: 10 / gfznb3.  webpage,  pdf,  citations: 3.
- [P5] J. Marco, **W. Jarosz**, D. Gutierrez, and A. Jarabo. “Transient Photon Beams”. In: *Spanish Computer Graphics Conference (CEIG)*. The Eurographics Association, June 2017. ISBN: 978-3-03868-046-8. DOI: 10 / gfznc.  webpage,  pdf,  citations: 9.  **CEIG 2017 Best Paper Award!**
- [P6] **R. Prévost**^{PhD}, M. Bächer, **W. Jarosz**, and O. Sorkine-Hornung. “Balancing 3D Models with Movable Masses”. In: *Proceedings of the Vision, Modeling and Visualization Workshop (VMV)*. Eurographics Association, Oct. 2016. DOI: 10/gfznds.  webpage,  pdf,  citations: 17.
- [P7] **D. Koerner**¹, J. Novák, P. Kutz, R. Habel, and **W. Jarosz**. “Subdivision Next-Event Estimation for Path-Traced Sub-surface Scattering”. In: *Proceedings of EGSR (Experimental Ideas & Implementations)*. The Eurographics Association, June 2016. DOI: 10 / gf6rjz.  webpage,  pdf,  citations: 5.
- [P8] A. Chapiro, C. O’Sullivan, **W. Jarosz**, M. Gross, and A. Smolic. “Stereo from Shading”. In: *Proceedings of EGSR (Experimental Ideas & Implementations)*. June 2015. DOI: 10/gf6rzk.  webpage,  pdf,  citations: 1.
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
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- [J58] **W. Jarosz**, **D. Nowrouzezahrai¹**, I. Sadeghi, and H. W. Jensen. “A Comprehensive Theory of Volumetric Radiance Estimation Using Photon Points and Beams”. In: *ACM Transactions on Graphics (Presented at SIGGRAPH)* 30.1 (Jan. 2011), 5:1–5:19. DOI: 10/fcdh2f.  webpage,  pdf,  citations: 142.
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- [P14] M. Papas, **W. Jarosz**, W. A. Jakob, S. M. Rusinkiewicz, W. Matusik, and T. A. Weyrich. “Reflective and refractive surfaces configured to project desired caustic pattern”. Patent 9188783 B1 (US). Nov. 2015.
- [P15] W. Jakob, C. Regg, and **W. Jarosz**. “Progressive expectation–maximization for hierarchical rendering of participating media”. Patent 9013484 B1 (US). Apr. 2015.
- [P16] **W. Jarosz**, M. Papas, D. Nowrouzezahrai, and T. Houit. “Refractive steganography lens and method for determining milling plan for same”. Patent 8964295 B2 (US). Apr. 2015.
- [P17] H. Bowles, K. Mitchell, R. Sumner, **W. Jarosz**, and M. Gross. “Iterative reprojection of images”. Patent 8624891 B2 (US). Jan. 2014.
- [P18] **W. Jarosz**, D. Nowrouzezahrai, R. Thomas, P.-P. Sloan, and M. Zwicker. “Image processing using iterative generation of intermediate images using photon beams of varying parameters”. Patent 8638331 B1 (US). Jan. 2014.
- [P19] **W. Jarosz**, D. Nowrouzezahrai, and S. Watson. “Compensation for self-scattering on concave screens”. Patent 8611005 B2 (US). Dec. 2013.
- [P20] S. C. Geiger, **W. Jarosz**, M. J. Lang, K. J. Mitchell, D. Nowrouzezahrai, R. W. Sumner, and T. Williams. “Virtual lens - rendering for augmented reality”. Patent 9164723 B1 (US). Jan. 2013.

“ Invited Talks & Lectures






- [L1] “Nonclassical Transport: From Graphics to Nuclear Engineering and Remote Sensing (and back again)”. Invited talk, UC San Diego Pixel Cafe. Dec. 2020.
- [L2] “Towards Point-and-Shoot Rendering: Robust and Automatic Light Transport Algorithms for Humans and Machines”. Invited talk, New England Symposium on Graphics. Apr. 2019.
- [L3] “Computer Graphics: Bridging the gap between art & science”. Invited talk, Dartmouth/Hanover High School STEM Pathways series. Sept. 2018.
- [L4] “Mastering the Interaction of Light & Matter: From Real to Virtual, and Back Again”. MIT CSAIL, Graphics Lunch. Feb. 2016.
- [L5] “Mastering the Interaction of Light & Matter: From Real to Virtual, and Back Again”. Invited Talk at BBN/Raytheon Technologies. Feb. 2016.
- [L6] “Visual Computing Lab Research Overview”. Invited talk, Dartmouth Thayer School of Engineering Colloquium. Feb. 2016.
- [L7] “Mastering the Interaction of Light & Matter: From Real to Virtual, and Back Again”. Computer Science Colloquium, Williams College. Oct. 2015.

- [J59] T. Hachisuka, **W. Jarosz**, and H. W. Jensen. “A Progressive Error Estimation Framework for Photon Density Estimation”. In: *ACM Transactions on Graphics (Proceedings of SIGGRAPH Asia)* 29.6 (Dec. 2010), 144:1–144:12. ISSN: 0730-0301. DOI: 10/czxq2t.  webpage,  pdf,  citations: 41.
- [J60] **W. Jarosz**, N. A. Carr, and H. W. Jensen. “Importance Sampling Spherical Harmonics”. In: *Computer Graphics Forum (Proceedings of Eurographics)* 28.2 (Apr. 2009), pp. 577–586. DOI: 10/b523xg.  webpage,  pdf,  citations: 46.
- [J61] T. Hachisuka, **W. Jarosz**, R. P. Weistroffer, K. Dale, G. Humphreys, M. Zwicker, and H. W. Jensen. “Multidimensional Adaptive Sampling and Reconstruction for Ray Tracing”. In: *ACM Transactions on Graphics (Proceedings of SIGGRAPH)* 27.3 (Aug. 2008), 33:1–33:10. DOI: 10/fm6czw.  webpage,  pdf,  citations: 183.
- [J62] S. Paris, W. Chang, O. I. Kozhushnyan, **W. Jarosz**, W. Matusik, M. Zwicker, and F. Durand. “Hair Photobooth: Geometric and Photometric Acquisition of Real Hairstyles”. In: *ACM Transactions on Graphics (Proceedings of SIGGRAPH)* 27.3 (Aug. 2008), 30:1–30:9. DOI: 10/df2r3s.  webpage,  pdf,  citations: 117.
- [J63] **W. Jarosz**, M. Zwicker, and J. Schulze. “EvalWare: Virtual Reality and Visualization Resources [Best of the Web]”. In: *Signal Processing Magazine, IEEE* 25.4 (July 2008), pp. 123–127. ISSN: 1053-5888. DOI: 10/b3pb3g.  citations: 2.
- [J64] **W. Jarosz**, M. Zwicker, and H. W. Jensen. “Irradiance Gradients in the Presence of Participating Media and Occlusions”. In: *Computer Graphics Forum (Proceedings of EGSR)* 27.4 (June 2008), pp. 1087–1096. DOI: 10/bg8nww.  webpage,  pdf,  citations: 22.  **Featured on the proceedings back cover!**
- [J65] **W. Jarosz**, M. Zwicker, and H. W. Jensen. “The Beam Radiance Estimate for Volumetric Photon Mapping”. In: *Computer Graphics Forum (Proceedings of Eurographics)* 27.2 (Apr. 2008), pp. 557–566. DOI: 10/bjsfsx.  webpage,  pdf,  citations: 126.
- [J66] **W. Jarosz**, C. Donner, M. Zwicker, and H. W. Jensen. “Radiance Caching for Participating Media”. In: *ACM Transactions on Graphics (Presented at SIGGRAPH)* 27.1 (Mar. 2008), 7:1–7:11. ISSN: 0730-0301. DOI: 10/cwnw78.  webpage,  pdf,  citations: 74.
- [J67] P. Clarberg, **W. Jarosz**, T. Akenine-Möller, and H. W. Jensen. “Wavelet Importance Sampling: Efficiently Evaluating Products of Complex Functions”. In: *ACM Transactions on Graphics (Proceedings of SIGGRAPH)* 24.3 (Aug. 2005), pp. 1166–1175. DOI: 10/c79g6q.  webpage,  pdf,  citations: 190.  **Featured on the proceedings back cover!**
- [L8] “High Dynamic Range Photography”. Invited Talk, Universidad de Zaragoza. Mar. 2015.
- [L9] “Mastering the Interaction of Light & Matter: From Real to Virtual, and Back Again”. Invited Talk, Visual Computing Lab, UC Berkeley. Aug. 2014.
- [L10] “Mastering the Interaction of Light & Matter: From Real to Virtual, and Back Again”. Stanford University. Computer Science Seminar, Invited Talk. Mar. 2014.
- [L11] “Mastering the Interaction of Light & Matter: From Real to Virtual, and Back Again”. Dartmouth College, Computer Science Colloquium. Feb. 2014.
- [L12] “The Perils of Evolutionary Rendering Research: Beyond the Point Sample”. Invited Talk, EGSR 2013. June 2013.
- [L13] “The Perils of Evolutionary Rendering Research: Beyond the Point Sample”. Keynote Talk. Journées du groupe de travail rendu. Mar. 2013.
- [L14] “The Perils of Evolutionary Rendering Research: Beyond the Point Sample”. Invited Talk, TU Wien Graphics Konversatorium. Feb. 2013.
- [L15] “*Tangled: Behind the Magic*”. Scientifica¹¹: Zürcher Wissenschaftstage, Disney-Night. Aug. 2011.
- [L16] “The Research Behind the Magic”. Computer Science - Distinguished Lecture Series, UIUC. Nov. 2010.
- [L17] “Non-Photorealistic Rendering”. Invited lecture for CSE 168, UCSD. June 2008.
- [L18] “Textures, Environment mapping, and Procedurals”. Invited lecture for CSE 168, UCSD. May 2008.
- [L19] “Efficient Light Transport in Scattering Media”. Invited Talk, Walt Disney Animation Studios, Los Angeles. Feb. 2008.
- [L20] “Efficient Light Transport in Scattering Media”. Invited lecture for CSE 272, UCSD. Dec. 2007.
- [L21] “Texturing”. Invited lecture for CSE 168, UCSD. May 2007.
- [L22] “Global Illumination”. Invited lecture for CSE 168, UCSD. May 2006.
- [L23] “OpenEXR: Towards Realtime Playback”. SIGGRAPH 2005 OpenEXR Birds of a Feather. Aug. 2005.
- [L24] “Non-Photorealistic Rendering”. Invited lecture for CSE 168, UCSD. June 2005.

Service & Professional Activities



Chairing & Editorial duties

- Associate editor, *ACM Transactions on Graphics (TOG)*  2020–Present
- Associate editor, *Journal of Computer Graphics Techniques (JCGT)*  2015–Present
- Associate editor, *Computer Graphics Forum (Wiley)*  2014–2017
- Co-editor and Papers co-chair, *Computer Graphics Forum (Eurographics Symposium on Rendering (EGSR))*  June 2014 issue
- Co-editor, *IEEE Computer Graphics & Applications (CG&A)*  May 2013 issue

Conference Committees

- **Steering Committee**, Eurographics Symposium on Rendering (EGSR) 📅 2017–Present
- **Technical Papers Conflict-of-Interest Coordinator**, ACM SIGGRAPH 📅 2021
- **Technical Papers Committee**, ACM SIGGRAPH 📅 2012, 2013, 2015, 2019, 2020
- **Papers Committee**, Eurographics Symposium on Rendering (EGSR) 📅 2010–2012, 2016, 2017, 2019, 2020
- **Full Papers International Program Committee**, Eurographics (EG) 📅 2013, 2014, 2016, 2019
- **Technical Papers Committee**, ACM SIGGRAPH Asia 📅 2017
- **International Program Committee**, GRAPP 📅 2015
- **Technical Program Committee**, SIBGRAPI 📅 2014
- **Papers Committee**, ACM SIGGRAPH Symposium on Interactive 3D Graphics and Games (i3D) 📅 2012–2014
- **Sketches Committee**, SIGGRAPH Asia 📅 2008, 2009

Reviewer

- NSF review panel member 📅 2018, 2021
- ACM SIGGRAPH 📅 2004–2019
- ACM SIGGRAPH Asia 📅 2008–2010, 2012–2014, 2017–2018
- ACM Transactions on Graphics (TOG) 📅 2009–2018
- Eurographics (EG) 📅 2008–2016, 2018
- Eurographics Symposium on Rendering (EGSR) 📅 2005, 2009–2012, 2015–2019
- Computer Graphics Forum 📅 2009–2011, 2013–2017
- The Visual Computer 📅 2007, 2010
- Interactive Ray Tracing 📅 2007

College Committees

- Diversity committee 📅 2020–Present
- Department Webmaster 📅 2015–Present
- M.S. D.A. admissions 📅 2016–2017, 2019
- Building planning committee 📅 2019–2020
- Faculty recruiting 📅 2017–2018, 2020
- Curriculum committee 📅 2019

- Ph.D. admissions 📅 2014–2016, 2020

Other

- Symposium on Computer Animation 📅 2007
Student Volunteer
- SIGGRAPH UIUC Student Chapter 📅 Jul. 2001–Jun. 2002
President

Press & Media Coverage



- 📄 “The physics of movie-making: making computer animation more realistic.” *SciTech Europa*. November 30, 2018.
<https://www.scitecheuropa.eu/computer-animation-movie-making/91132/>
- 📄 “New software will let artists control how light interacts with objects.” *ars|technica*. November 30, 2018.
<https://arstechnica.com/science/2018/11/new-software-will-let-artists-control-how-light-interacts-with-objects/>
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- 📄 “You Can Stop Worrying, Disney Figured Out How to Make Perfect CG Sugar.” *Gizmodo*. December 8, 2016.
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- 📄 “This simulation is so good it’s hard to believe it’s not real.” *Popular Mechanics*. December 8, 2016.

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- 📄 “Disney Research Devises a Method of 3D Printing Models That Balance or Breakdance.” *3DPrint.com*. October 7, 2016.
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- 📄 “Scientists Develop Spray Cans That Know What to Paint.” *Wall Street Journal Video*. May 2, 2016.
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 - ☰ “Scientists Invent Robotic ‘Artist’ That Spray Paints Giant Murals.” *NeuroScienceNews*. April 7, 2016.
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 - ☰ “Scientists invent robotic ‘artist’ that spray paints giant murals.” *PhysOrg*. April 7, 2016.
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 - ☰ “Think You Know Rainbows? Look Again.” *Scientific American*. February 26, 2016.
<http://www.scientificamerican.com/article/think-you-know-rainbows-look-again-slide-show/>
 - ☰ “New device improves full-color image projection.” *PhysOrg*. October 21, 2015.
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 - ☰ “5 Crazy New Ideas Out Of Disney Research.” *FastCompany*. August 7, 2015.
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 - ☰ “New method efficiently renders granular materials at multiple scales.” *PhysOrg*. August 5, 2015.
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 - ☰ “The State of Rendering - Part 2.” *fxguide*. July 17, 2013.
<http://www.fxguide.com/featured/the-state-of-rendering-part-2/>
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- ☰ “A new way to improve computer graphics.” *Roland Piquepaille's Technology Trends*. Apr. 16, 2008.
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- ☰ “A better fog and smoke machine from computer scientists at UC San Diego.” *EurekaAlert*. Apr. 15, 2008.
- ☰ “An Easier Way to Simulate a Foggy View.” *Photonics Spectra Magazine*. October, 2007.
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- ☰ “Render Smoke and Fog without being a Computation Hog.” *Jacobs School News*. Aug. 9, 2007.
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- ☰ “Calitz Lights Up SIGGRAPH 2005.” *HPC Wire*. Aug. 4, 2005.
- ☰ “Light Clouds, Camera Arrays and Speedier Rendering at SIGGRAPH 2005.” *UCSD News*. July 28, 2005.
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- ☰ “California Institute researchers unveil computer graphics innovations at SIGGRAPH.” *EurekaAlert*. July 28, 2005
- ☰ “Researchers Unveil Computer Graphics Innovations at SIGGRAPH.” *Red Orbit*. July 28, 2005.