

# Christian Richardt

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## EDUCATION

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**2012 PhD in Computer Science** — *University of Cambridge, England*

Dissertation: COLOUR VIDEOS WITH DEPTH — ACQUISITION, PROCESSING AND EVALUATION

*My research investigated the full life cycle of videos with depth (RGBZ videos): from their acquisition, via filtering and processing, to the evaluation of stereoscopic display.*      Supervisor: Neil A. Dodgson

**2011 Master of Arts** — *University of Cambridge, England*

**2007 Bachelor of Arts (Honours) in Computer Science** — *University of Cambridge, England*

First class honours (highest honours), ranked 3rd out of 72 in final year (Part II)

Final-year dissertation: FLASH-EXPOSURE HIGH DYNAMIC RANGE IMAGING

*My project extended HDR imaging techniques and showed useful computational photography applications like virtual photography and an intelligent flash.*      Supervisor: Rahul Vohra

**2004 Allgemeine Hochschulreife (Abitur)** — *Albert-Schweitzer-Gymnasium, Erfurt, Germany*

Average mark: 1.0 (highest honours); majored in mathematics and computer science

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## RESEARCH & WORK EXPERIENCE

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**Summer 2012 Research Intern (5 months)** — *Disney Research, Zurich, Switzerland*

Host: Alexander Hornung

**2010–2011 Visiting Scholar (7 months)** — *MPI Informatik, Saarbrücken, Germany*

*In this project, I built a prototype Kinect-like RGBZ video camera and devised algorithms to upsample, denoise and smooth the depth data to create high-resolution coherent RGBZ videos. These enable video processing effects that go beyond what is possible using just a colour video.*      Host: Christian Theobalt

**Summer 2008 Research Intern (3 months)** — *Disney Research, Zurich, Switzerland*

*and Walt Disney Animation Studios, Burbank, California, United States of America*

*I researched approaches for compensating ‘ghosting’ artefacts caused by crosstalk in stereoscopic 3D projection setups. The resulting perceptually-based compensation technique can greatly improve the viewing experience of stereoscopic 3D imagery.*      Hosts: Markus Gross & Rasmus Tamstorf

**Summer 2007 Software Engineering Intern (4 weeks)** — *Mindquarry, Potsdam, Germany*

*I assisted in the design and development of a simple one-click Subversion client for novice users, which involved user interface design in SWT/.jface, and analysis and rectification of bug reports.*

**Summer 2006 Summer Intern (3 months)** — *The MathWorks, Cambridge, England*

*My work investigated techniques for integrating highly optimised signal processing routines into a code-generation software environment based on model-based design (Simulink); I presented my findings to about 20 engineers in the UK and US.*

**Summer 2005 Student Research Assistant (3 months)** — *Fraunhofer IOF, Jena, Germany*

*I developed of a point cloud post-processing application in C++ and experimented with multi-threaded performance optimisation.*      Host: Matthias Heinze

## PUBLICATIONS

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- 2012 **Random Discrete Colour Sampling**  
Henrik Lieng, **Christian Richardt** and Neil A. Dodgson  
In *Proceedings of Computational Aesthetics*, 2012 (to appear)
- Coherent Spatiotemporal Filtering, Upsampling and Rendering of RGBZ Videos**  
**Christian Richardt**, Carsten Stoll, Neil A. Dodgson, Hans-Peter Seidel and Christian Theobalt  
*Computer Graphics Forum (Proceedings of Eurographics)*, 31(2), 2012 [\[HTML\]](#) [\[PDF\]](#)
- 2011 **Layered Photo Pop-Up** – *Winner of the ACM SIGGRAPH Student Research Competition*  
Lech Świrski, **Christian Richardt** and Neil Dodgson  
Poster at *SIGGRAPH*, 2011 [\[HTML\]](#) [\[PDF\]](#) [\[DOI\]](#)
- Predicting Stereoscopic Viewing Comfort Using a Coherence-Based Computational Model**  
**Christian Richardt**, Lech Świrski, Ian P. Davies and Neil A. Dodgson  
In *Proceedings of Computational Aesthetics*, 2011 [\[HTML\]](#) [\[PDF\]](#) [\[DOI\]](#)
- 2010 **Real-Time Spatiotemporal Stereo Matching Using the Dual-Cross-Bilateral Grid**  
**Christian Richardt**, Douglas Orr, Ian Davies, Antonio Criminisi and Neil A. Dodgson  
In *Proceedings of the European Conference on Computer Vision (ECCV)*, 2010 [\[HTML\]](#) [\[PDF\]](#) [\[DOI\]](#)
- Stereo Coherence in Watercolour Rendering**  
**Christian Richardt**, Jan Eric Kyprianidis and Neil A. Dodgson  
Poster at the symposia on *NPAR* and *Computational Aesthetics*, 2010 [\[PDF\]](#)
- 2009 **Proteus – Semi-Automatic Interactive Structure-from-Motion**  
Malte Schwarzkopf and **Christian Richardt**  
Poster at the *Vision, Modelling, and Visualization (VMV)* workshop, 2009 [\[HTML\]](#) [\[PDF\]](#)
- Voronoi Video Stylisation**  
**Christian Richardt** and Neil A. Dodgson  
In *Proceedings of Computer Graphics International (short papers)*, 2009 [\[HTML\]](#) [\[PDF\]](#) [\[DOI\]](#)

## ACADEMIC EXPERIENCE

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- Invited Talks** **Coherent Depth in Stereo Vision**  
Adobe Advanced Technology Labs Seattle, August 2011  
Microsoft Research Redmond, August 2011 [\[HTML\]](#)  
Google Seattle, August 2011
- Predicting stereoscopic viewing comfort**  
GrUVi Lab at Simon Fraser University, August 2011
- Flash-Exposure HDR Imaging**  
ETH Zurich Graphics Lunch, November 2007
- Teaching** **Supervising**  
*I have taught groups of 2–3 undergraduates for around 350 hours, mostly on computer graphics & image processing, and computer vision, but also on information theory, algorithms, probability, and type theory.*
- Student projects**  
*I have supervised a total of 9 undergraduate final-year projects in 2008–2012 (4 jointly with others). 4 project dissertations were in the top 10 per cent. I have also informally supervised a Masters project.*
- Lecturing**  
*I prepared and gave a one-hour lecture on non-photorealistic rendering (NPR) to an audience of graduate and undergraduate students.*
- Reviewing** CVPR, PAMI, TVCG, CVIU, CGI, NPAR
- Volunteering** *I was a student volunteer at Eurographics in 2007 and 2008, and I organised my research group's seminar series between January and March 2009.*

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## QUALIFICATIONS, AWARDS & ACHIEVEMENTS

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- 2011 Winner of the ACM SIGGRAPH Student Research Competition (SRC)  
Associate of the Higher Education Academy (AHEA)
- 2007–2011 EPSRC Doctoral Training Studentship
- 2007 Data Connection Dissertation Prize  
Honorary Cambridge European Trust Scholar
- 2006 The MathWorks Bursary in Computer Science
- 2005–2007 Senior Scholar of Gonville & Caius College
- 2004–2007 Cambridge European Trust Bursary
- 2000–2004 Distinctions in German Mathematics competitions, top 16 in Germany

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## ACTIVITIES

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- Research group** Set up a project server with code repositories, wikis and issue tracking for easier project management (based on [Redmine](#), 2010–2012).
- University** Student member of the University of Cambridge Society Syndicate’s Technical Committee (2009–2010) which grants up to £15,000 to student clubs and societies.
- German Society** President (2008–2009), Treasurer (2009–2010), and Webmaster (2006–2008) of the Cambridge University German Society. I introduced a new wiki-based society website and embraced Facebook for membership and events organisation.
- College** Computing Officer of Gonville & Caius postgraduate student union (2008–2009) and Gonville & Caius Students’ Union (2005–2007), as which I represented the interests and needs of more than 700 students to the College Computing Committee.
- Wikipedia** Wikimedia Commons administrator (2005–2010), editor in both the English and German Wikipedias.

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## ADDITIONAL SKILLS

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**Languages** German (native), English (fluent), French (basic conversational)

**Programming**

- Scientific** C/C++, C#, [MATLAB](#), [Java](#) in [Visual Studio](#), [Xcode](#), [Eclipse](#)
- GPGPU** [CUDA](#), [GLSL](#)
- Scripting** [Python](#), [batch files](#), [shell scripts](#)
- Libraries** [OpenCV](#), [OpenGL](#), [OpenNI](#), [OpenSceneGraph](#), [Qt](#), [libav](#)
- Web sites** [HTML](#), [CSS](#), [PHP](#), [Apache](#), [MySQL](#)

**Computing**

- Office software** [Microsoft Word](#), [Excel](#), [PowerPoint](#), [Publisher](#) & [Outlook](#); [Apple Keynote](#), [Pages](#) & [Numbers](#); [L<sup>A</sup>T<sub>E</sub>X](#) with [TikZ](#); [OpenOffice](#)/[LibreOffice](#)

- Digital media** [VirtualDub](#); [AviSynth](#); [PhotoLine](#); [Adobe Photoshop](#), [Lightroom](#) & [Illustrator](#); [Autodesk Maya](#); [Blender](#)

- Operating systems** [Mac OS X](#), [Windows](#), [Linux/Unix](#)  
(level of skill: [basic](#), [intermediate](#) & [advanced](#))

— *References are available on request.* —