

CHRISTIAN RICHARDT

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X [@c_richardt](https://twitter.com/c_richardt)

RESEARCH EXPERIENCE

- 2025–now **Research Scientist Lead** — *Meta Reality Labs Research, Zurich, Switzerland*
- 2022–2024 **Research Scientist Lead** — *Codec Avatars Lab, Meta Reality Labs, Pittsburgh, USA*
I am working on capturing, reconstructing and rendering highly realistic real-world environments.
- 2019–2022 **Reader (Associate Professor)** — *Department of Computer Science, University of Bath, England*
- 2016–2019 **Lecturer (Assistant Professor)** — *Department of Computer Science, University of Bath, England*
My research combined insights from vision, graphics and perception to reconstruct visual information from images and videos, to create high-quality visual experiences with a focus on 6-degree-of-freedom VR video.
- Mar. 2014 **Postdoctoral Fellow** — *Intel Visual Computing Institute and MPI Informatik, Saarbrücken, Germany*
– Jul. 2016 *I worked on user-centric video processing and motion capture in mobile scenarios, with a focus on reconstructing dynamic scenes from a few handheld cameras.* With Christian Theobalt
- Oct. 2012 **Postdoctoral Fellow (16 months)** — *Inria Sophia Antipolis – Méditerranée, Sophia Antipolis, France*
– Feb. 2014 *I worked on image-based rendering and vector graphics.* With George Drettakis & Adrien Bousseau
- Summer 2012 **Research Intern (5 months)** — *Disney Research, Zurich, Switzerland*
I worked on creating high-resolution, high-quality stereoscopic panoramas based on omnidirectional stereo (patented). Published as oral presentation at CVPR 2013. Host: Alexander Sorkine-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. Host: Christian Theobalt
- Summer 2008 **Research Intern (3 months)** — *Disney Research, Zurich and Walt Disney Animation Studios, Burbank, CA*
I researched approaches for compensating ‘ghosting’ artefacts in stereoscopic 3D projection setups to improve the viewing experience. Hosts: Markus Gross & Rasmus Tamstorf

FUNDING

- 2019–2022 **CAMERA MC2**
Co-I, £690,578 — EU Horizon 2020
- 2018–2021 **6-DoF VR Video: Towards Immersive 360-degree VR Video with Motion Parallax**
PI, £694,260 — EPSRC-UKRI Innovation Fellowship (EP/S001050/1)
- 2015–2021 **Centre for the Analysis of Motion, Entertainment Research and Applications (CAMERA)**
Co-I, £5m — Next Stage Digital Economy Centre (EP/M023281/1)

EDUCATION

- 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)
- 2004 **Allgemeine Hochschulreife (Abitur)** — *Albert-Schweitzer-Gymnasium, Erfurt, Germany*
Average mark: 1.0 (highest honours); majored in mathematics and computer science

PUBLICATIONS

→ See also my profiles on *Google Scholar*, *Semantic Scholar* and *DBLP*.

- 2025 Time of the Flight of the Gaussians: Optimizing Depth Indirectly in Dynamic Radiance Fields**
Runfeng Li, Mikhail Okunev, Zixuan Guo, Anh Ha Duong, **C. Richardt**, M. O'Toole and J. Tompkin
Proceedings of CVPR, 2025 (**oral**, 0.7% acceptance rate) [website] [pdf] [arXiv]
- SoundVista: Novel-View Ambient Sound Synthesis via Visual-Acoustic Binding**
Mingfei Chen, Israel D. Gebru, Ishwarya Ananthabhotla, **Christian Richardt**, Dejan Markovic, Steven Krenn, Todd Keebler, Jacob Sandakly, Alexander Richard and Eli Shlizerman
Proceedings of CVPR, 2025 (**highlight**, 3.0% acceptance rate) [website] [pdf] [arXiv]
- IRIS: Inverse Rendering of Indoor Scenes from Low Dynamic Range Images**
Chih-Hao Lin, J.-B. Huang, Z. Li, Z. Dong, **C. Richardt**, T. Li, M. Zollhöfer, J. Kopf, S. Wang and C. Kim
Proceedings of CVPR, 2025 [website] [pdf] [arXiv]
- Geometry-guided Online 3D Video Synthesis with Multi-View Temporal Consistency**
Hyunho Ha, L. Xiao, **C. Richardt**, T. Nguyen-Phuoc, C. Kim, M. H. Kim, D. Lanman and N. Khan
Proceedings of CVPR, 2025 [website] [pdf] [arXiv]
- Volumetric Surfaces: Representing Fuzzy Geometries with Layered Meshes**
Stefano Esposito, Anpei Chen, Christian Reiser, Samuel Rota Bulò, Lorenzo Porzi, Katja Schwarz, **Christian Richardt**, Michael Zollhöfer, Peter Kotschieder and Andreas Geiger
Proceedings of CVPR, 2025 [website] [pdf] [arXiv]
- 360° 3D Photos from a Single 360° Input Image**
Manuel Rey-Area and **Christian Richardt**
IEEE Transactions on Visualization and Computer Graphics (IEEE VR 2025), 31(5), 2025 [website] [pdf] [doi]
- 2024 URAvatar: Universal Relightable Gaussian Codec Avatars**
Junxuan Li, C. Cao, G. Schwartz, R. Khiroudkar, **C. Richardt**, T. Simon, Y. Sheikh and S. Saito
Proceedings of SIGGRAPH Asia, 2024 [website] [pdf] [doi] [arXiv]
- F-TöRF: Flowed Time of Flight Radiance Fields**
Mikhail Okunev, Marc Mapeke, Benjamin Attal, **Christian Richardt**, Matthew O'Toole, James Tompkin
European Conference on Computer Vision (ECCV), 2024 [website] [pdf] [doi]
- IntrinsicDiffusion: Joint Intrinsic Layers from Latent Diffusion Models**
Jundan Luo, D. Ceylan, J. S. Yoon, N. Zhao, J. Philip, A. Frühstück, W. Li, **C. Richardt** and T. Y. Wang
Proceedings of SIGGRAPH, 2024 [website] [pdf] [doi]
- PlatoNeRF: 3D Reconstruction in Plato's Cave via Single-View Two-Bounce Lidar**
Tzofi Klinghoffer, X. Xiang, S. Somasundaram, Y. Fan, **C. Richardt**, R. Raskar and R. Ranjan
Proceedings of CVPR, 2024 (**oral**, 0.8% acceptance rate) [website] [pdf] [doi] [arXiv]
- HybridNeRF: Efficient Neural Rendering via Adaptive Volumetric Surfaces**
H. Turki, V. Agrawal, S. Rota Bulò, L. Porzi, P. Kotschieder, D. Ramanan, M. Zollhöfer, **C. Richardt**
Proceedings of CVPR, 2024 (**highlight**, 2.8% acceptance rate) [website] [pdf] [doi] [arXiv]
- SpecNeRF: Gaussian Directional Encoding for Specular Reflections**
Li Ma, V. Agrawal, H. Turki, C. Kim, C. Gao, P. V. Sander, M. Zollhöfer and **C. Richardt**
Proceedings of CVPR, 2024 (**highlight**, 2.8% acceptance rate) [website] [pdf] [doi] [arXiv]
- Real Acoustic Fields: An Audio-Visual Room Acoustics Dataset and Benchmark**
Ziyang Chen, I. D. Gebru, **C. Richardt**, A. Kumar, W. Laney, A. Owens and A. Richard
Proceedings of CVPR, 2024 (**highlight**, 2.8% acceptance rate) [website] [pdf] [doi] [arXiv]
- ViewDiff: 3D-Consistent Image Generation with Text-to-Image Models**
L. Höllein, A. Božič, N. Müller, D. Novotny, H.-Y. Tseng, **C. Richardt**, M. Zollhöfer and M. Nießner
Proceedings of CVPR, 2024 [website] [pdf] [doi] [arXiv]
- CRefNet: Learning Consistent Reflectance Estimation With a Decoder-Sharing Transformer**
Jundan Luo, Nanxuan Zhao, Wenbin Li and **Christian Richardt**
IEEE Transactions on Visualization and Computer Graphics, 30(9), 2024 [website] [pdf] [doi]

- 2023 VR-NeRF: High-Fidelity Virtualized Walkable Spaces**
 Linning Xu, Vasu Agrawal, William Laney, Tony Garcia, Aayush Bansal, Changil Kim, Samuel Rota Bulò, Lorenzo Porzi, Peter Kotschieder, Aljaž Božič, Dahua Lin, Michael Zollhöfer and **Christian Richardt**
Proceedings of SIGGRAPH Asia, 2023 [[website](#)] [[pdf](#)] [[doi](#)] [[arXiv](#)]
- PyNeRF: Pyramidal Neural Radiance Fields**
 Haithem Turki, Michael Zollhöfer, **Christian Richardt** and Deva Ramanan
Advances in Neural Information Processing Systems (NeurIPS), 2023 [[website](#)] [[pdf](#)] [[arXiv](#)]
- Neural Feature Filtering for Faster Structure-from-Motion Localisation**
 Alexandros Rotsidis, Yuxin Wang, Yiorgos Chrysanthou and **Christian Richardt**
Proceedings of BMVC, 2023 [[website](#)] [[pdf](#)]
- Neural Fields for Structured Lighting**
 Aarrushi Shandilya, Benjamin Attal, **Christian Richardt**, James Tompkin and Matthew O'Toole
Proceedings of ICCV, 2023 [[website](#)] [[pdf](#)] [[doi](#)]
- HyperReel: High-Fidelity 6-DoF Video with Ray-Conditioned Sampling**
 B. Attal, J.-B. Huang, **C. Richardt**, M. Zollhöfer, J. Kopf, M. O'Toole and C. Kim
Proceedings of CVPR, 2023 (**highlight**, **2.6% acceptance rate**) [[website](#)] [[pdf](#)] [[doi](#)] [[arXiv](#)]
- Learning Neural Duplex Radiance Fields for Real-Time View Synthesis**
 Ziyu Wan, **C. Richardt**, A. Božič, C. Li, V. Rengarajan, S. Nam, X. Xiang, T. Li, B. Zhu, R. Ranjan, J. Liao
Proceedings of CVPR, 2023 [[website](#)] [[pdf](#)] [[doi](#)] [[arXiv](#)]
- 2022 Egocentric Scene Reconstruction from an Omnidirectional Video**
 Hyeonjoong Jang, Andréas Meuleman, Dahyun Kang, Donggun Kim, **Christian Richardt**, Min H. Kim
ACM Transactions on Graphics (Proceedings of SIGGRAPH), 41(4), 2022 [[website](#)] [[pdf](#)] [[doi](#)]
- 360MonoDepth: High-Resolution 360° Monocular Depth Estimation**
 Manuel Rey-Area*, Mingze Yuan* and **Christian Richardt**
Proceedings of CVPR, 2022 [[website](#)] [[pdf](#)] [[doi](#)] [[arXiv](#)]
- 2021 TöRF: Time-of-Flight Radiance Fields for Dynamic Scene View Synthesis**
 B. Attal, E. Laidlaw, A. Gokaslan, C. Kim, **C. Richardt**, J. Tompkin and M. O'Toole
Advances in Neural Information Processing Systems (NeurIPS), 2021 [[website](#)] [[pdf](#)] [[arXiv](#)]
- 360° Optical Flow using Tangent Images**
 Mingze Yuan and **Christian Richardt**
British Machine Vision Conference (BMVC), 2021 [[website](#)] [[pdf](#)] [[arXiv](#)]
- Fast, High-Quality Hierarchical Depth-Map Super-Resolution**
 Yiguo Qiao, Licheng Jiao, Wenbin Li, **Christian Richardt** and Darren Cosker
ACM Multimedia, 2021 [[doi](#)]
- Real-time Global Illumination Decomposition of Videos**
 Abhimitra Meka*, Mohammad Shafiei*, Michael Zollhöfer, **Christian Richardt** and Christian Theobalt
ACM Transactions on Graphics, 2021 [[website](#)] [[pdf](#)] [[doi](#)] [[arXiv](#)]
- ExMaps: Long-Term Localization in Dynamic Scenes using Exponential Decay**
 Alexandros Rotsidis, Christof Lutteroth, Peter Hall and **Christian Richardt**
Winter Conference on Applications of Computer Vision (WACV), 2021 [[website](#)] [[pdf](#)] [[doi](#)]
- 2020 OmniPhotos: Casual 360° VR Photography**
 Tobias Bertel, Mingze Yuan, Reuben Lindroos and **Christian Richardt**
ACM Transactions on Graphics (Proceedings of SIGGRAPH Asia), 39(6), 2020 [[website](#)] [[pdf](#)] [[doi](#)]
- Deferred Neural Rendering for View Extrapolation**
 Tobias Bertel, Yusuke Tomoto, Srinivas Rao, Rodrigo Ortiz-Cayon, Stefan Holzer and **Christian Richardt**
 Poster at *SIGGRAPH Asia*, 2020 [[website](#)] [[pdf](#)] [[doi](#)]
- Casual Real-World VR using Light Fields**
 Y. Tomoto, S. Rao, T. Bertel, K. Chande, **C. Richardt**, S. Holzer and R. Ortiz-Cayon
 Poster at *SIGGRAPH Asia*, 2020 [[website](#)] [[pdf](#)] [[doi](#)]

Free-Viewpoint Facial Re-Enactment from a Casual Capture

Rao, Ortiz-Cayon, Munaro, Liaudanskas, Chande, Bertel, **Richardt**, Trevor, Holzer and Kar
Poster at SIGGRAPH Asia, 2020 [\[website\]](#) [\[pdf\]](#) [\[doi\]](#)

Photorealistic Audio-driven Video Portraits

Xin Wen, Miao Wang, **Christian Richardt**, Ze-Yin Chen and Shi-Min Hu
IEEE Transactions on Visualization and Computer Graphics (ISMAR 2020), 26(12), 2020 [\[website\]](#) [\[pdf\]](#) [\[doi\]](#)

BlockGAN: Learning 3D Object-aware Scene Representations from Unlabelled Images

Thu Nguyen-Phuoc, **Christian Richardt**, Long Mai, Yong-Liang Yang and Niloy Mitra
Advances in Neural Information Processing Systems (NeurIPS), 2020 [\[website\]](#) [\[pdf\]](#) [\[arXiv\]](#)

Transitioning360: Content-aware NFOV Virtual Camera Paths for 360° Video Playback

Miao Wang, Yi-Jun Li, Wen-Xuan Zhang, **Christian Richardt** and Shi-Min Hu
International Symposium on Mixed and Augmented Reality (ISMAR), 2020 [\[website\]](#) [\[pdf\]](#) [\[doi\]](#)

MatryODShka: Real-time 6DoF Video View Synthesis using Multi-Sphere Images

Benjamin Attal, Selena Ling, Aaron Gokaslan, **Christian Richardt** and James Tompkin
European Conference on Computer Vision (ECCV), 2020 (**oral**, **2.1% acceptance rate**) [\[website\]](#) [\[pdf\]](#) [\[arXiv\]](#) [\[doi\]](#)

Combining Task Predictors via Enhancing Joint Predictability

Kwang In Kim, **Christian Richardt** and Hyung Jin Chang
European Conference on Computer Vision (ECCV), 2020 [\[website\]](#) [\[pdf\]](#) [\[arXiv\]](#) [\[doi\]](#)

Capture, Reconstruction, and Representation of the Visual Real World for Virtual Reality

Christian Richardt, James Tompkin and Gordon Wetzstein
Book chapter in *Real VR – Immersive Digital Reality*, Springer, 2020 [\[pdf\]](#) [\[doi\]](#)

Image-Based Scene Representations for Head-Motion Parallax in 360° Panoramas

Tobias Bertel, Feng Xu and **Christian Richardt**
Book chapter in *Real VR – Immersive Digital Reality*, Springer, 2020 [\[pdf\]](#) [\[doi\]](#)

Depth Augmented Omnidirectional Stereo for 6-DoF VR Photography

T. Bertel*, M. Mühlhausen*, M. Kappel, P. M. Bittner, **C. Richardt** and M. Magnor
Poster at *IEEE VR*, 2020 [\[website\]](#) [\[pdf\]](#) [\[doi\]](#)

Omnidirectional Stereo

Christian Richardt
In *Computer Vision: A Reference Guide*, Springer, 2020 [\[pdf\]](#) [\[doi\]](#)

2019 Neural Style-Preserving Visual Dubbing

H. Kim, M. Elgharib, M. Zollhöfer, H.-P. Seidel, T. Beeler, **C. Richardt** and C. Theobalt
ACM Transactions on Graphics (Proceedings of SIGGRAPH Asia), 38(6), 2019 [\[website\]](#) [\[pdf\]](#) [\[arXiv\]](#) [\[doi\]](#)

Real-time Virtual Object Insertion for Moving 360° Videos

Joanna Tarko, James Tompkin and **Christian Richardt**
Intern. Conference on Virtual-Reality Continuum and its Applications in Industry (VRCAI), 2019 [\[pdf\]](#) [\[doi\]](#)

HoloGAN: Unsupervised Learning of 3D Representations From Natural Images

Thu Nguyen-Phuoc, Chuan Li, Lucas Theis, **Christian Richardt** and Yong-Liang Yang
International Conference on Computer Vision (ICCV), 2019 [\[website\]](#) [\[pdf\]](#) [\[arXiv\]](#) [\[doi\]](#)

Capture4VR: From VR Photography to VR Video

Christian Richardt, Peter Hedman, Ryan S. Overbeck, Brian Cabral, Robert Konrad and Steve Sullivan
SIGGRAPH Course, 2019 [\[website\]](#) [\[doi\]](#)

Near-Eye Display and Tracking Technologies for Virtual and Augmented Reality

George-Alex Koulieris, Kaan Akşit, Michael Stengel, Rafał Mantiuk, Katerina Mania, **Christian Richardt**
Computer Graphics Forum (Eurographics 2019 STAR) [\[website\]](#) [\[pdf\]](#) [\[doi\]](#)

MegaParallax: Casual 360° Panoramas with Motion Parallax

Tobias Bertel, Neill Campbell and **Christian Richardt**
IEEE Transactions on Visualization and Computer Graphics (IEEE VR 2019), 25(5), 2019 [\[website\]](#) [\[pdf\]](#) [\[doi\]](#)

OmniMR: Omnidirectional Mixed Reality with Spatially-Varying Environment Reflections from Moving 360° Video Cameras

Joanna Tarko, James Tompkin and **Christian Richardt**
Poster at *IEEE VR*, 2019

2018 **MegaParallax: 360° Panoramas with Motion Parallax** — *Best Short Paper Award*

Tobias Bertel, Neill Campbell and **Christian Richardt**
Short Paper at *European Conference on Visual Media Production (CVMP)*, 2018 [\[website\]](#) [\[pdf\]](#)

Environment Reflections with 360° Videos using Omnidirectional Structure from Motion

Joanna Tarko and **Christian Richardt**
Short Paper at *European Conference on Visual Media Production (CVMP)*, 2018 [\[pdf\]](#)

Cutting-Edge VR/AR Display Technologies

George-Alex Koulouris, Kaan Akşit, **Christian Richardt** and Rafał Mantiuk
SIGGRAPH Asia Course, 2018 [\[website\]](#) [\[doi\]](#)

Unsupervised Attention-guided Image-to-Image Translation

Youssef Alami Mejjati, **Christian Richardt**, James Tompkin, Darren Cosker and Kwang In Kim
Advances in Neural Information Processing Systems (NeurIPS), 2018 [\[website\]](#) [\[pdf\]](#) [\[arXiv\]](#)

Deep Video Portraits

H. Kim, P. Garrido, A. Tewari, W. Xu, J. Thies, M. Nießner, P. Pérez, **C. Richardt**, M. Zollhöfer, C. Theobalt
ACM Transactions on Graphics (Proceedings of SIGGRAPH), 37(4), 2018 [\[website\]](#) [\[pdf\]](#) [\[arXiv\]](#) [\[doi\]](#)

MegaParallax: 360° Panoramas with Motion Parallax

Tobias Bertel and **Christian Richardt**
Poster at *SIGGRAPH*, 2018 [\[website\]](#) [\[pdf\]](#) [\[doi\]](#)

LIME: Live Intrinsic Material Estimation

A. Meka, M. Maximov, M. Zollhöfer, A. Chatterjee, H.-P. Seidel, **C. Richardt** and C. Theobalt
Proceedings of CVPR, 2018 (**spotlight presentation**, **6.6% acceptance rate**) [\[website\]](#) [\[pdf\]](#) [\[arXiv\]](#) [\[doi\]](#)

InverseFaceNet: Deep Monocular Inverse Face Rendering

Hyeongwoo Kim, Michael Zollhöfer, Ayush Tewari, Justus Thies, **Christian Richardt**, Christian Theobalt
Proceedings of CVPR, 2018 [\[website\]](#) [\[pdf\]](#) [\[arXiv\]](#) [\[doi\]](#)

Cutting-Edge VR/AR Display Technologies

George-Alex Koulouris, Kaan Akşit, Rafał Mantiuk, **Christian Richardt** and Katerina Mania
Tutorial at *IEEE Conference on Virtual Reality and 3D User Interfaces (VR)*, 2018 [\[website\]](#)

Parallax360: Stereoscopic 360° Scene Representation for Head-Motion Parallax

Bicheng Luo, Feng Xu, **Christian Richardt** and Jun-Hai Yong
IEEE Transactions on Visualization and Computer Graphics, 24(4), 2018 [\[website\]](#) [\[pdf\]](#) [\[doi\]](#)

2017 **Undoing Instagram Filters**

Padraig Boulton and **Christian Richardt**
Short Paper at *European Conference on Visual Media Production (CVMP)*, 2017 [\[pdf\]](#)

Dynamic Mixed-Reality Compositing with Unity

Joanna Tarko, **Christian Richardt** and Peter Hall
Short Paper at *European Conference on Visual Media Production (CVMP)*, 2017 [\[pdf\]](#)

Predictor Combination at Test Time

Kwang In Kim, James Tompkin and **Christian Richardt**
International Conference on Computer Vision (ICCV), 2017 [\[pdf\]](#) [\[doi\]](#)

Live User-Guided Intrinsic Video For Static Scenes

Abhimitra Meka*, Gereon Fox*, Michael Zollhöfer, **Christian Richardt** and Christian Theobalt
IEEE Transactions on Visualization and Computer Graphics, 23(11), 2017 [\[website\]](#) [\[pdf\]](#) [\[doi\]](#)

Video for Virtual Reality

Christian Richardt, James Tompkin, Jordan Halsey, Aaron Hertzmann, Jonathan Starck, Oliver Wang
SIGGRAPH Course, 2017 [\[website\]](#) [\[doi\]](#)

- 2016 **EgoCap: Egocentric Marker-less Motion Capture with Two Fisheye Cameras**
H. Rhodin, **Christian Richardt**, D. Casas, E. Insafutdinov, M. Shafiei, H.-P. Seidel, B. Schiele, C. Theobalt
ACM Transactions on Graphics (Proceedings of SIGGRAPH Asia), 35(8), 2016 [\[website\]](#) [\[pdf\]](#) [\[arXiv\]](#) [\[doi\]](#)
- Dense Wide-Baseline Scene Flow From Two Handheld Video Cameras**
Christian Richardt, Hyeonwoo Kim, Levi Valgaerts and Christian Theobalt
International Conference on 3D Vision (3DV), 2016 (**oral presentation**) [\[website\]](#) [\[pdf\]](#) [\[arXiv\]](#) [\[doi\]](#)
- Video Depth-From-Defocus**
Hyeonwoo Kim, **Christian Richardt** and Christian Theobalt
International Conference on 3D Vision (3DV), 2016 [\[website\]](#) [\[pdf\]](#) [\[arXiv\]](#) [\[doi\]](#)
- Real-time Halfway Domain Reconstruction of Motion and Geometry**
Lucas Thies, Michael Zollhöfer, **Christian Richardt**, Christian Theobalt and Günther Greiner
International Conference on 3D Vision (3DV), 2016 [\[website\]](#) [\[pdf\]](#) [\[arXiv\]](#) [\[doi\]](#)
- General Automatic Human Shape and Motion Capture Using Volumetric Contour Cues**
Helge Rhodin, Nadia Robertini, Dan Casas, **Christian Richardt**, Hans-Peter Seidel, Christian Theobalt
European Conference on Computer Vision (ECCV), 2016 (**spotlight presentation**) [\[website\]](#) [\[pdf\]](#) [\[arXiv\]](#) [\[doi\]](#)
- Live Intrinsic Video**
Abhimitra Meka, Michael Zollhöfer, **Christian Richardt** and Christian Theobalt
ACM Transactions on Graphics (Proceedings of SIGGRAPH), 35(4), 2016 [\[website\]](#) [\[pdf\]](#) [\[doi\]](#)
- 2015 **A Versatile Scene Model with Differentiable Visibility Applied to Generative Pose Estimation**
Helge Rhodin, Nadia Robertini, **Christian Richardt**, Hans-Peter Seidel and Christian Theobalt
International Conference on Computer Vision (ICCV), 2015 [\[website\]](#) [\[pdf\]](#) [\[arXiv\]](#) [\[doi\]](#)
- User-Centric Computational Videography**
Christian Richardt, James Tompkin, Jiamin Bai and Christian Theobalt
SIGGRAPH Course, 2015 [\[website\]](#) [\[doi\]](#)
- 4D Model Flow: Precomputed Appearance Alignment for Real-time 4D Video Interpolation**
Dan Casas, **Christian Richardt**, John Collomosse, Christian Theobalt and Adrian Hilton
Computer Graphics Forum (Proceeding of Pacific Graphics), 2015 [\[website\]](#) [\[pdf\]](#) [\[doi\]](#)
- 2014 **Vectorising Bitmaps into Semi-Transparent Gradient Layers**
Christian Richardt, Jorge Lopez-Moreno, Adrien Bousseau, Maneesh Agrawala and George Drettakis
Computer Graphics Forum (Proceeding of EGSR), 33(4), 2014 [\[website\]](#) [\[pdf\]](#) [\[doi\]](#)
- Temporally Coherent Video De-Anaglyph**
Joan Sol Roo and **Christian Richardt**
Talk and Poster at *SIGGRAPH*, 2014 [\[website\]](#) [\[pdf\]](#) [\[doi\]](#)
- 2013 **Megastereo: Constructing High-Resolution Stereo Panoramas**
Christian Richardt, Yael Pritch, Henning Zimmer and Alexander Sorkine-Hornung
Proceedings of CVPR, 2013 (**oral presentation**, **3.3% acceptance rate**) [\[website\]](#) [\[pdf\]](#) [\[doi\]](#)
- Perception of Perspective Distortions in Image-Based Rendering**
Peter Vangorp, **Christian Richardt**, Emily Cooper, Gaurav Chaurasia, Martin Banks, George Drettakis
ACM Transactions on Graphics (Proceedings of SIGGRAPH), 32(4), 2013 [\[website\]](#) [\[pdf\]](#) [\[doi\]](#)
- 2012 **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 [\[website\]](#) [\[pdf\]](#) [\[doi\]](#)
- Random Discrete Colour Sampling**
Henrik Lieng, **Christian Richardt** and Neil A. Dodgson
Computational Aesthetics, 2012 [\[website\]](#) [\[pdf\]](#) [\[doi\]](#)
- 2011 **Layered Photo Pop-Up — Winner of the ACM SIGGRAPH Student Research Competition**
Lech Świrski, **Christian Richardt** and Neil A. Dodgson
Poster at *SIGGRAPH*, 2011 [\[website\]](#) [\[pdf\]](#) [\[doi\]](#)

Predicting Stereoscopic Viewing Comfort Using a Coherence-Based Computational Model

Christian Richardt, Lech Świrski, Ian P. Davies and Neil A. Dodgson

Computational Aesthetics, 2011 [[website](#)] [[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

European Conference on Computer Vision (ECCV), 2010 [[website](#)] [[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 [[website](#)] [[pdf](#)]

Voronoi Video Stylisation

Christian Richardt and Neil A. Dodgson

Computer Graphics International (short papers), 2009 [[website](#)] [[pdf](#)] [[doi](#)]

ACADEMIC EXPERIENCE

Service **Conference Organisation**

Workshop Co-Organiser for DynaVis 2020, DynaVis 2021 and DynaVis 2023
Conference Co-Chair for CVMP 2021
Sponsorship Chair for 3DV 2021
Conference Chair for CVMP 2020
Short Papers & Demo Chair for CVMP 2019
Doctoral Consortium Co-Chair at ISMAR 2019 and ISMAR 2020
Website Chair for CVMP 2018
Publicity Chair for the Expressive/CAe-SBIM-NPAR in 2011, 2013, 2014, 2015 and 2016.

Program committees

CVPR Area Chair 2025
ICCV Area Chair 2023
ISMAR 2021
CVMP 2018–2020
Expressive 2013–2015, 2017–2019
Pacific Graphics 2019

Public speaking **Towards More Immersive Panoramas**

Bath Royal Literary and Scientific Institution (Bath), September 2019

VR Photography: from the Victorians to today

Pint of Science (Bath), May 2019

Stereoscopic and 6-Degree-of-Freedom Photography

Royal Photographic Society (Bath), May 2018

3D photography: from the Victorians to Virtual Reality

Pint of Science (Bath), May 2017

Invited talks **High-Fidelity Neural Radiance Fields**

Carnegie Mellon University, Oct 2024
University of Illinois at Urbana Champaign, May 2024

VR-NeRF: High-Fidelity Virtualized Walkable Spaces

VCLAB at Korea Advanced Institute of Science and Technology (KAIST), April 2024
University of Bath, October 2023

Towards More Immersive Photos and Videos

University of Cambridge, October 2023

Towards Reconstructing and Editing the Visual World

CVIT Summer School on AI (IIIT Hyderabad), August 2021
GVV Group at MPI Informatik, December 2019
VCLAB at Korea Advanced Institute of Science and Technology (KAIST), November 2019
Ulsan National Institute of Science and Technology (UNIST), October 2019
Beihang University, October 2019
Tsinghua University, October 2019
Facebook Menlo Park, August 2019
Google San Francisco, August 2019
Fyusion San Francisco, August 2019

Towards 6-DoF 360° Panoramas

International Virtual Reality Photography Association Conference, June 2019

Towards Reconstructing the Visual World

Imperial College London, August 2018

CVLAB at École polytechnique fédérale de Lausanne (EPFL), July 2018

University College London, July 2018

Microsoft Research Cambridge, April 2018

Rainbow Group at University of Cambridge, April 2018

Reconstructing Visual Information from Images and Videos

Oslo and Akershus University College of Applied Sciences, November 2015

Graphics, Vision & Interaction Group at Harvard University, August 2014

Computer Graphics Group at MIT, August 2014

Techniques for Creating High-Quality Visuals

Computer Graphics Lab at TU Berlin, September 2013

Visual Computing Lab at University of California, Berkeley, May 2013

Graphics Laboratory at Stanford University, May 2013

Coherent Depth in Stereo Vision

Adobe Advanced Technology Labs Seattle, August 2011

Microsoft Research Redmond, August 2011 [\[website\]](#)

Google Seattle, August 2011

Predicting Stereoscopic Viewing Comfort

GrUVi Lab at Simon Fraser University, Vancouver, August 2011

Flash-Exposure HDR Imaging

ETH Zurich Graphics Lunch, November 2007

Reviewing Full Member of the EPSRC Peer Review College (2020–now)

Associate Editor, The Visual Computer (2019–2020)

Journals (selection):

ACM Transactions on Graphics	2013, 2016–2019, 2025
IEEE Transactions on Pattern Analysis and Machine Intelligence	2011, 2014, 2019, 2022–2024
IEEE Transactions on Image Processing	2014, 2015, 2018, 2019
International Journal of Computer Vision	2019
IEEE Transactions on Visualization and Computer Graphics	2011, 2013–2024
IEEE Computer Graphics & Applications	2017, 2019
Computer Graphics & Applications	2015–2017, 2021
Computers & Graphics	2013–2017, 2023–2024

Conferences (selection):

ACM SIGGRAPH	2013, 2016–2025
ACM SIGGRAPH General Submissions (Talks, Installations)	2018, 2019
ACM SIGGRAPH Asia	2016–2018, 2020–2024
Eurographics	2012, 2014–2017, 2020–2023
Computer Vision and Pattern Recognition (CVPR)	2011, 2014–2016, 2019–2024
International Conference on Computer Vision (ICCV)	2015, 2017, 2019, 2021
European Conference on Computer Vision (ECCV)	2014, 2020, 2022, 2024
Neural Information Processing Systems (NeurIPS)	2020
International Conference on 3D Vision (3DV)	2019–2021, 2025
Winter Conference on Applications of Computer Vision (WACV)	2020
IEEE Virtual Reality (VR)	2014, 2017–2019, 2025
International Symposium on Mixed and Augmented Reality (ISMAR)	2020, 2021
Pacific Graphics	2016, 2019, 2020
Expressive Symposium on CAe, SBIM and NPAR	2014, 2015, 2017–2019

TEAM

Supervised PhD & EngD students

- 2021–2025 Jundan Luo: *Intrinsic image decomposition*
- 2020–2025 Manuel Rey Area: *Deep view synthesis for VR video*
- 2019–2023 Alexandros Rotsidis: *Mobile localisation for AR*
- 2018–2022 Kenneth Dasalla: *Mixed-reality production solutions, VR locomotion*
- 2017–2020 Joanna Tarko: *Mixed-reality rendering*
- 2016–2021 Tobias Bertel: *Image-based rendering, casual VR photography*

Former team members

- 2020–2021 Joanna Tarko, Postdoc
- 2019–2021 Reuben Lindroos, Research Software Engineer
- 2019–2021 Mingze Yuan, Research Software Engineer
- 2019–2020 Ramakrishna Mundugar, Postdoc

Mentored PhD students

- 2018–2021 Thu Nguyen-Phuoc: *Generative image models*
- 2015–2020 Abhimitra Meka: *Live intrinsic video, material estimation*
- 2014–2019 Hyeongwoo Kim: *Video refocusing, inverse rendering for faces, deep video portraits, visual dubbing*
- 2015–2016 Helge Rhodin: *Unconstrained motion capture*
- 2015–2016 Lucas Thies: *Real-time scene flow*
- 2014 Hamid Sarmadi: *Intrinsic video*

Supervised Masters students

- 2021 Juan Quintero Ovalle: *Spatially varying style transfer*
- 2020 Georgios Klouris: *Deep image colourisation*
Yongqiang Zhu: *360° optical flow*
- 2019 Tzu-Yi Chen: *Deep 360° inpainting*
Qiuzhu Jin: *Image vignette removal*
Brandon Lee: *Image vignette removal*
Yih Siang Teh: *Deep 360° inpainting*
- 2018 Kenneth Dasalla: *Multi-view HDR video*
Jacob Haynes: *360° lightprobes*
- 2017 Alex Baer: *Stabilising time lapses*
Padraig Boulton: *Inverting Instagram filters*
Andrew Shin: *Foreign exchange technical analysis*
- Summer 2013 Joan Sol Roo: *Video de-anaglyph*
- 2009–2010 Lech Świrski: *Stereoscopic pop-up*

Supervised Interns

- 2023 Linning Xu (CityU HK), Li Ma (HKUST), Haithem Turki (CMU)
- Summer 2009 Douglas Orr: *Real-time stereo vision*

Supervised Bachelor students

- 2020–2021 Nick Chapman: *Removing distractions from photos*
Edward Gokmen: *2-DoF pose estimation*
Kai Patel: *Deep GIF quality enhancement*
Toby Roe: *Audio source separation for jazz backing tracks*
- 2018–2019 Omar Reid: *Pose estimation for augmented reality*
Oliver Broomhall: *AR Jenga*
- 2017–2018 Liam Berrisford: *Underwater scene reconstruction*
Freddie Millman: *Undoing image enhancements*
James O'Donnell: *Visual media generation within a game engine*

- 2016–2017 Oliver Shannon-Lepper: *Hands in VR*
- 2011–2012 Joseph Seaton: *Shader compositor*
- 2010–2011 James Neve: *Converting anaglyph 3D to stereoscopic 3D*
Ludwig Schmidt: *Streaming videos of solar imaging data*
- 2009–2010 Mark Wheeler: *Lecture voting system*
Rubin Xu: *A GPU-enabled real-time video processing library*
- 2008–2009 Aloysius Han: *Panorama viewfinding*
Malte Schwarzkopf: *Interactively guided structure-from-motion*
Lech Świrski: *Automatic people removal from photographs*

TEACHING

Lecturing

- 2021–2022 **Fundamentals of Visual Computing** (CM20219, University of Bath)
- 2016–2018 *This second-year undergraduate course is an introduction to the theoretical and mathematical foundations of image processing, computer graphics and computer vision. The course is attended by 160 computer science and electrical engineering students. I introduced coursework based on [three.js](#), which students rated highly.*
- 2016–2019 **Visual Understanding 1** (CM50248, University of Bath)
This intensive, coursework-heavy Masters-level course (15 hours of lectures in 3 weeks) provides a solid coverage of the fundamentals of image processing, computer vision and multi-view geometry that are required for visual understanding tasks, such as convolution, features, matching, calibration and triangulation.

Seminar

- 2014–2016 **Computer Vision for Computer Graphics** with Christian Theobalt (at Saarland University)
In this seminar with 8–11 students, each student gives a half-hour presentation about two state-of-the-art papers from computer vision and graphics, which is followed by an hour of group discussion. In 2016, the students ranked our seminar as the best computer science seminar offered in the semester.

Courses & Tutorials

- 2019 **Capture4VR: From VR Photography to VR Video** at SIGGRAPH 2019
I organised this half-day course on the journey from VR photography to VR video that began more than a century ago but which has accelerated tremendously in the last five years. We discussed commercial state-of-the-art systems by Facebook, Google and Microsoft, and the latest research techniques and prototypes.
- 2018 **Cutting-Edge VR/AR Display Technologies** at IEEE VR 2018 and SIGGRAPH Asia 2018
In this full-day tutorial on the latest VR and AR display technology (with George-Alex Kouliris, Kaan Akşit, Rafał Mantiuk and Katerina Mania), I presented on ‘motion-aware displays’. My part covers different kinds of motion input for VR/AR displays, including head tracking, hand tracking and full-body motion capture.
- 2017 **Video for Virtual Reality** at SIGGRAPH 2017
I co-organised this half-day course on fusion of video and virtual reality technology with James Tompkin. The course provides an overview of three aspects of this promising fusion: technical foundations, current systems in practice, and the potential for future systems of VR video.
- 2015 **User-Centric Computational Videography** at SIGGRAPH 2015
I organised a half-day course on user-centric video techniques with James Tompkin, Jiamin Bai and Christian Theobalt. We covered state-of-the-art techniques that aim to improve the quality and flexibility of capturing, editing and exploring of consumer videos.

Tutoring (Cambridge ‘Supervisions’)

- 2007–2012 *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.*

QUALIFICATIONS, AWARDS & ACHIEVEMENTS

- 2023 Outstanding Reviewer Award at CVPR 2023 (232 total) [\[website\]](#)
- 2022 Outstanding Reviewer Award at ECCV 2022 (205 total) [\[website\]](#)
- 2021 Outstanding Reviewer Award at ICCV 2021 (210 total) [\[website\]](#)
Outstanding Reviewer Award at CVPR 2021 (1,065 total) [\[website\]](#)
- 2020 Top-10% Reviewer at NeurIPS 2020 (~700 total)
- 2019 Outstanding Reviewer Award at ICCV 2019 (95 total) [\[website\]](#)
- 2018 EPSRC UKRI Innovation Fellowship (ranked first in panel)
Fellow of the Higher Education Academy (FHEA)
Best Short Paper Award for “MegaParallax” at CVMP 2018 conference
- 2017 Best Poster Award for “EgoCap” at Motion in Games (MIG) conference [\[website\]](#)
- 2016 Busy Beaver Award (best CS seminar at Saarland University in summer semester 2016)
- 2012–2014 Inria Post-doctoral Research Fellowship
- 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
- 2004 Forth prize in “Jugend forscht” (*Germany-wide competition for school-aged ‘researchers’*)
for an optical 3D measurement system (using structured light)
- 2000–2004 Distinctions in German Mathematics competitions, top 16 in Germany

MEDIA COVERAGE

- 2023 “Venturing Beyond Reality: VR-NeRF”. [Neural Radiance Fields](#), 8 Nov 2023
- 2021 “This AI makes Robert De Niro perform lines in flawless German”. [Ars Technica](#), 22 May 2021
“360° VR Photography Is Here!”, [Two Minute Papers \(YouTube\)](#), 17 Apr 2021
- 2020 “Create a realistic VR experience using a normal 360-degree camera”, [Press Release](#), 14 Dec 2020
- 2018 “You thought fake news was bad? Deep fakes are where truth goes to die”, [The Guardian](#), 12 Nov 2018
“Can you tell a fake video from a real one?”, [ABC News \(Australia\)](#), 29 Sep 2018
“The New AI Tech Turning Heads in Video Manipulation”, [SingularityHub](#), 3 Sep 2018
“AI could make dodgy lip sync dubbing a thing of the past”, [Press Release](#), 17 August 2018
“Deepfake Videos Are Getting Impossibly Good”, [Gizmodo](#), 12 June 2018
“This new face-swapping AI is scarily realistic”, [Fast Company](#), 12 June 2018
“AI can transfer human facial movements from one video to another”, [Engadget](#), 5 June 2018
“Forget DeepFakes, Deep Video Portraits are way better (and worse)”, [TechCrunch](#), 5 June 2018
- 2017 “Augmented Reality in real”, [Technology Review](#) (Germany), 23 March 2017
- 2013 “Disney Research Creates Megastereo – Panoramas With Depth”, [Slashdot](#), 23 June 2013
“Team creates techniques for high quality, high resolution stereo panoramas”, [Phys.org](#), 21 June 2013

PATENTS

- 2024 “Deferred neural rendering for view extrapolation” – US Patent 11,887,256
2018 “Stereoscopic panoramas” – JP Patent 6,273,163
2016 “Stereoscopic panoramas” – US Patent 9,398,215

ADDITIONAL SKILLS

Languages German (native), English (fluent), [French](#) (basic conversational)

Programming

Scientific C/C++ (Visual Studio, Xcode), Python (Jupyter Notebook)

Libraries OpenCV, PyTorch, NumPy, SciPy, Eigen, Ceres, [TensorFlow](#)

Web sites HTML, CSS, PHP, WordPress, [Jekyll](#), [jQuery](#), [Apache](#), [MySQL](#)

Computing

Office software Microsoft Word, Excel, PowerPoint, Outlook; \LaTeX with TikZ;

Digital media Adobe Photoshop, Premiere, Acrobat, Lightroom & Illustrator; [Blender](#)