

DONALD G. DANSEREAU

Rose Street Building J04
University of Sydney, NSW, 2006
Donald.Dansereau@gmail.com

Citizenship: Canadian, Australian
Languages: English, French
<https://roboticimaging.org>

RESEARCH INTERESTS

Robotic imaging, computational imaging, robotic vision, machine learning, medical robotics and telemedicine, light field and plenoptic signal processing, imaging underwater and in challenging environments

EDUCATION

PhD Mechatronics Engineering, The University of Sydney, NSW, Australia, Feb 2014

Australian Centre for Field Robotics, Department of Aerospace, Mechanical and Mechatronic Engineering
Advisors: Prof. S. B. Williams, Dr. O. Pizarro

- Thesis: "Plenoptic Signal Processing for Robust Vision in Field Robotics"

MSc Electrical Engineering, The University of Calgary, AB, Canada, June 2004

Department of Electrical and Computer Engineering Advisor: Prof. L. T. Bruton

- Dissertation: "4D Light Field Processing and its Application to Computer Vision"
- Governor General's Gold Medal for outstanding thesis, GPA: 4.00 / 4.00

BSc Electrical Engineering with Distinction, The University of Calgary, AB, Canada, June 2001

Department of Electrical and Computer Engineering

- Minor in Computer Engineering, 16-month Engineering Internship Program, GPA: 4.00 / 4.00

WORK EXPERIENCE

University of Sydney, Australian Centre for Robotics, Robotic Imaging Lab

Continuing Academic: Senior Lecturer, Aug 2018–present

- Sensing and Perception Theme Lead for ARIAM ITRH Research Hub, 2022–
- University Academic Board Member, 2024–
- Associate Head of School (Research Education) / Postgraduate Coordinator, 2023–2024
- School Research Education Director / Postgraduate Coordinator, 2021–2022
- Mechatronics 3rd year advisor, 2021–
- Lab Head, Robotic Imaging Lab
- Exploring how new imaging technologies can help robots see and do

Stanford University, Stanford Computational Imaging Lab

Postdoctoral Scholar in Electrical Engineering, 2016–2018

- Computational imaging for scientific, robotic and virtual reality applications
- World's first single-lens wide-field-of-view light field camera: design, prototyping, and algorithms
- Live streaming VR capture via novel camera architectures: camera design and construction
- Machine learning for light field analysis
- Prototyping and evaluating novel optical elements using nano-scale 3D laser lithography

EPIImaging, LLC

Technical Consultant, 2017–present

- Algorithmic development and feasibility studies for the company's unique light field video camera

Integral Scopes

Founder and Scientific Advisor, 2019–2021

Queensland University of Technology, Australian Centre for Robotic Vision

QUT Visiting Fellow, ACRV Research Affiliate, 2016–2020

Postdoctoral Research Fellow, 2014–2016

- Novel cameras and algorithms for robust robotic vision
- Dealing with low light, occluders, and motion blur
- Image-based visual servoing for light field cameras

- Publishing and supporting open-source tools for light field research

University of Sydney, Australian Centre for Field Robotics, Marine Robotics Group

Honorary Research Fellow, 2014–2018

Research Associate, Lecturer, 2013–2014; PhD Candidate, Teaching Assistant, 2010–2013

- Plenoptic processing for robust vision in challenging environments
- Decoding and calibrating handheld and array-based plenoptic cameras
- Novel algorithms for distractor isolation and change detection from moving platforms
- Linear methods for enhancing imagery through occluders and in murky water or low light
- Closed-form visual odometry from handheld plenoptic cameras
- Lecturer for final-year / masters-level experimental robotics class, 2014
- Teaching assistant: Tutorial and lab for experimental robotics class, 2010–2013
- Visiting Scholar at University of Victoria, BC, MDSP Group, Jul/Aug 2014

McGill University, Center for Intelligent Machines, Shared Reality Lab

Research Associate, 2009–2010

- Machine learning for predictive latency compensation in shared virtual environments

DFT Microsystems (now Introspect Technology)

Senior Software Specialist, 2006–2009

- Researched test methodologies for high-data-rate jitter injection, measurement, and analysis
- Developed embedded software for DFT's flagship product, a high-speed SerDes test module
- Full project cycle: requirements, design, implementation, documentation, maintenance
- Mentored and supervised three developers working on PC and embedded software
- Designed soft-core embedded processors and peripherals on FPGA using Verilog, Altera tools

SolVision Inc.

Vision Developer, 2005–2006

- Researched computer vision techniques for ball-grid array and flip-chip bump inspection
- Designed algorithms for shape estimation, defect detection, lighting and focus adjustment
- Developed statistical techniques for chip packaging metrology and process control

Artificial Mind and Movement (now Behaviour Interactive)

Software Developer, Simulation Team Lead, 2004–2005

- Designed and implemented physics and particle systems for multi-platform video games
- Led a small team responsible for in-game physics and animation, and associated artist's tools

University of Calgary

Research Assistant, MSc Student, Teaching Assistant 2001–2004

- Researched light field processing techniques with applications in computer vision
- Constructed a camera gantry and associated software for measuring light fields
- Implemented a software suite for synthesizing and manipulating light fields
- Researched multi-dimensional linear digital filters and filter banks for performing depth filtering
- Developed nonlinear gradient-based and statistical methods for depth estimation
- Implemented a steerable directional microphone array using a multi-dimensional analog filter
- Implemented dynamic, robust 3D video watermarking techniques in Matlab and C++
- Teaching assistant for five undergraduate engineering classes

TRLabs

Research Assistant (Internship), 1999–2000

- Wireless and fibre optic channel research
- Radio channel measurements studying the impact of the channel on digital modulation techniques
- Researched predistortion and harmonic upconversion techniques for radio-on-fibre applications including machine learning-based approaches
- Developed real-time DSP, FPGA-based channel measurement, analysis and optimization tools

HONOURS AND AWARDS

- Best poster: IEEE International Conference on Robotics and Automation workshop on Multidisciplinary Approaches to Co-Creating Trustworthy Autonomous Systems, 2023
- Best poster: IEEE UNITE NSW, 2022
- Faculty unit of study commendation: MTRX3760, 2021, 2022
- Supervisor of the Year Award (Engineering): Sydney University Postgraduate Representative Association (SUPRA), 2021
- Distinguished Poster: Stanford Center for Image Systems Engineering (SCIEN), 2016, 2017
- Best paper: Australasian Conference on Robotics and Automation (ACRA), 2014

PhD

- Travel grant for Nautilus Navigator program, Institute for Exploration, 2011, 2013
- International Postgraduate Research Scholarship, International Postgraduate Award, 2010–2013
- Postgraduate Research Support Scheme, 2010–2013
- CVPR Doctoral Consortium / Travel Grant, 2013
- Best Postgraduate Poster in Mechatronic Engineering, Research Conversazione, 2012
- Peter Nicol Russell Postgraduate Scholarship in Mechanical Engineering, 2010

MSc

- Governor General's Gold Medal – top thesis university-wide, 2004
- Natural Sciences and Engineering Research Council (NSERC) PGSA Scholarship, 2001–2003
- iCORE Graduate Student Fellowship Grant, 2001–2003
- U of C Graduate Travel Award, 2003
- U of C Fee Scholarship, 2001

BSc

- Engineering Institute of Canada Student of the Year Medal, 2001
- APEGGA Gold Medal in Electrical Engineering, 2001
- Mike Ward Engineering Internship Prize and Engineering Internship Merit Award, 2000
- AFCEA Scholarship and NSERC Undergraduate Student Research Award, 2000
- Fluor Daniel Canada Inc. and CGPA Manley Frith Memorial Scholarships, 1999
- U of C Undergraduate Merit Awards, 1997, 1998, 1999
- U of C Matriculation Merit Award and Transalta Utilities Matriculation Scholarship, 1996
- CBE Career and Technology Scholarship and Alexander Rutherford Scholarship, 1996

FUNDING

External Grants

- SmartSat CRC “Technology Development for In-orbit Servicing, Assembly and Manufacturing” (ISAM), CI, AUD\$2.4M, 2023–2025
- NSW Space Research Network Research Pilot Project “Satellite servicing docking system with event-based cameras”, CI, AUD\$149k, 2023–2024
- ARC Research Hub “Intelligent Robotic Systems for Real-Time Asset Management”, CI and Theme Lead, AUD\$5M, 2022–2027
- Ford Alliance “Light Field Imaging for All-Weather Autonomous Driving”, Lead CI, AUD\$274k, 2022–2024
- CRC-P “ARIA Research”, CI and Theme Lead, AUD\$1.95M, 2022–2024
- Innovation Connections Grant, “Robotic imaging for autonomous inspection and intervention with an advanced agile underwater drone”, Academic Lead, AUD\$146k, 2022–2024
- University of Michigan / USyd / UCSD partnership “Monocentric Lens for Robotic Imaging”, Lead CI, USD\$75k, 2021
- Mitsubishi Heavy Industries Industry Grant “Lunar Rover Concept Study”, CI and Sensing Lead, AUD\$42k, 2020–2021

- NSF/Intel Partnership on Visual and Experiential Computing “Wide Field of View Monocentric Computational Light Field Imaging”, USD\$450k, (Intel #1539120, NSF #IIS-1539120), Stanford University: Program Lead, 2016–2018
- Huawei Industry Grant “Novel Imaging Capabilities using Huawei’s Dual-Camera Modules”, USD\$150k, Stanford University: Science Lead, 2017–2018
- Australia Research Council Discovery Project DP150104440, “A Photometric Imaging Model for Mobile Underwater Camera Design”, AUD\$323.5k, Proposal Lead and Program Consultant, 2015–2018
- Endeavour Research Fellowship, “Plenoptic Underwater Imaging”, AUD\$11k, Lead CI, 2014

Competitive Internal Grants

- Faculty of Engineering and IT Early Career Researcher Development Competitive Research Scheme, AUD\$40k, Lead CI, 2019
- Sydney Institute for Robotics and Intelligent Systems Competitive Research Grant “Automating Camera Interpretation: Bridging Computational Imaging and Robotics”, AUD\$84k, Lead CI, 2018

Equipment Grants

- Modulated Structured Illumination System, AUD\$7.1k, USyd 2022
- Stereo Microscope, AUD\$7.5k, USyd 2021
- Custom Light Field Camera, AUD\$9.5k, QUT 2017
- Dynamic and Active Pixel Vision Sensor, AUD\$10k, QUT 2016
- LunaRoo Lunar Payload Challenge, AUD\$4.5k, QUT 2015

PUBLICATIONS

Journal

1. A. K. Taras, N. Suenderhauf, P. Corke, and **D. G. Dansereau**, “Inherently privacy-preserving vision for trustworthy autonomous systems: Needs and solutions,” *Journal of Responsible Technology*, vol. 17, p. 100079, 2024.
2. A. Ravendran, M. Bryson, and **D. G. Dansereau**, “BuFF: Burst feature finder for light-constrained 3D reconstruction,” *Robotics and Automation Letters (RA-L) and Conference on Robotics and Automation (ICRA)*, 2023.
3. T. Coppin, D. W. Palmer, K. Rana, **D. G. Dansereau**, M. J. Collins, D. A. Atchison, J. Roberts, R. Crawford, and A. Jaiprakash, “Design of a focused light field fundus camera for retinal imaging,” *Signal Processing: Image Communication*, p. 116869, 2022.
4. T. Frizza, **D. G. Dansereau**, N. M. Seresht, and M. Bewley, “Semantically accurate super-resolution generative adversarial networks,” *Computer Vision and Image Understanding (CVIU)*, p. 103464, 2022.
5. A. Ravendran, M. Bryson, and **D. G. Dansereau**, “Burst imaging for light-constrained structure-from-motion,” *IEEE Robotics and Automation Letters (RA-L, ICRA)*, vol. 7, pp. 1040–1047, Apr. 2022.
6. D. Tsai, P. Corke, T. Peynot, and **D. G. Dansereau**, “Refractive light-field features for curved transparent objects in structure from motion,” *IEEE Robotics and Automation Letters (RA-L, IROS)*, vol. 6, Jun. 2021.
7. T. Wang and **D. G. Dansereau**, “Multiplexed illumination for classifying visually similar objects,” *Applied Optics*, vol. 60, no. 10, pp. B23–B31, Apr 2021.
8. S. K. Gullapalli, C. U. S. Edussooriya, C. Wijenayake, **D. G. Dansereau**, L. T. Bruton, and A. Madanayake, “Wave-digital filter circuits for single-chip 4-D light field depth-based enhancement,” *Multidimensional Systems and Signal Processing (MSSP)*, 2021.
9. C. Edussooriya, C. Wijenayake, A. Madanayake, N. Liyanage, S. Premaratne, J. Vorhies, **D. G. Dansereau**, P. Agathoklis, and L. Bruton, “Real-time light field signal processing using 4D/5D digital filter FPGA circuits,” *IEEE Transactions on Circuits and Systems II: Express Briefs*, 2021.

10. G. M. Schuster, **D. G. Dansereau**, G. Wetzstein, and J. E. Ford, "Panoramic single-aperture multi-sensor light field camera," *Optics Express*, vol. 27, no. 26, pp. 37 257–37 273, 2019.
11. D. Tsai, **D. G. Dansereau**, T. Peynot, and P. Corke, "Distinguishing refracted features using light field cameras with application to structure from motion," *IEEE Robotics and Automation Letters (RA-L, ICRA)*, vol. 4, no. 2, pp. 177–184, Apr. 2019.
12. D. W. Palmer, T. Coppin, K. Rana, **D. G. Dansereau**, M. Suheimat, M. Maynard, D. Atchison, J. Roberts, R. Crawford, and A. Jaiprakash, "Glare-free retinal imaging using a portable light field fundus camera," *Biomedical Optics Express*, 2018.
13. D. L. Bongiorno, M. Bryson, T. Bridge, **D. G. Dansereau**, and S. B. Williams, "Coregistered hyperspectral and stereo image seafloor mapping from an autonomous underwater vehicle," *Journal of Field Robotics (JFR)*, vol. 35, no. 3, pp. 312–329, 2018.
14. **D. G. Dansereau***, R. Konrad*, A. Masood, and G. Wetzstein, "SpinVR: Towards live-streaming 3D virtual reality video," *ACM Transactions on Graphics (TOG), SIGGRAPH ASIA*, vol. 36, no. 6, Nov. 2017.
15. D. Tsai, **D. G. Dansereau**, T. Peynot, and P. Corke, "Image-based visual servoing with light field cameras," *IEEE Robotics and Automation Letters (RA-L)*, vol. 2, no. 2, Apr. 2017.
16. **D. G. Dansereau**, S. B. Williams, and P. I. Corke, "Simple change detection from mobile light field cameras," *Computer Vision and Image Understanding (CVIU)*, vol. 145C, pp. 160–171, 2016.
17. **D. G. Dansereau**, O. Pizarro, and S. B. Williams, "Linear volumetric focus for light field cameras," *ACM Transactions on Graphics (TOG)*, Presented at SIGGRAPH 2015, vol. 34, no. 2, p. 15, Feb. 2015.
18. C. U. S. Edussooriya, **D. G. Dansereau**, L. T. Bruton, and P. Agathoklis, "Five-dimensional (5-D) depth-velocity filtering for enhancing moving objects in light field videos," *IEEE Transactions on Signal Processing (TSP)*, vol. 63, no. 8, pp. 2151–2163, Apr. 2015.
19. **D. G. Dansereau**, N. Brock, and J. R. Cooperstock, "Predicting an orchestral conductor's baton movements using machine learning," *Computer Music Journal*, vol. 37, no. 2, pp. 28–45, 2013.
20. A. Madanayake, R. Wimalagunaratne, **D. G. Dansereau**, R. J. Cintra, and L. T. Bruton, "VLSI architecture for 4-D depth filtering," *Signal, Image and Video Processing*, pp. 1–10, Jul. 2013.
21. R. Wimalagunaratne, C. Wijenayake, A. Madanayake, **D. G. Dansereau**, and L. T. Bruton, "Integral form 4-D light field filters using Xilinx FPGAs and 45 nm CMOS technology," *Multidimensional Systems and Signal Processing (MSSP)*, 2013.
22. **D. G. Dansereau** and L. T. Bruton, "A 4-D dual-fan filter bank for depth filtering in light fields," *IEEE Transactions on Signal Processing (TSP)*, vol. 55, no. 2, pp. 542–549, 2007.

Scientific Magazine Articles

1. C. Roman, G. Inglis, I. Vaughn, C. Smart, **D. G. Dansereau**, D. Bongiorno, M. Johnson-Roberson, and M. Bryson, "New tools and methods for precision sea floor mapping," *New Frontiers in Ocean Exploration: The E/V Nautilus 2012 Field Season and Summary of Mediterranean Exploration, Oceanography*, vol. 26, no. 1, supplement, pp. 10–15, Mar. 2013.
2. A. Madanayake, C. Wijenayake, **D. G. Dansereau**, T. K. Gunaratne, L. T. Bruton, and S. B. Williams, "Multidimensional (MD) circuits and systems for emerging applications including cognitive radio, radio astronomy, robot vision and imaging," *Circuits and Systems Magazine*, vol. 13, no. 1, pp. 10–43, 2013.

Patent

1. A. Jaiprakash, D. Palmer, **D. G. Dansereau**, T. Coppin, K. Rana, J. Roberts, and R. Crawford, "Ophthalmic imaging apparatus and system," May 2023, US Patent No. 11337607, 11779210.
2. M. Hafed, **D. G. Dansereau**, G. Duerden, S. Laberge, Y. Nazon, and C. Tam, "System and method for physical-layer testing of high-speed serial links in their mission environments," Aug. 2008, U.S. Patent #20080192814.

Conference

1. R. Griffiths, J. Naylor, and **D. G. Dansereau**, "NOCaL: Calibration-free semi-supervised learning of odometry and camera intrinsics," in *Robotics and Automation (ICRA)*, 2023.
2. A. Taras and **D. G. Dansereau**, "Hyperbolic view dependency for all-in-focus time of flight fields," in *Australasian Conference on Robotics and Automation (ACRA)*, 2022.
3. S. T. Digumarti, J. Daniel, A. Ravendran, R. Griffiths, and **D. G. Dansereau**, "Unsupervised learning of depth estimation and visual odometry for sparse light field cameras," in *Intelligent Robots and Systems (IROS)*. IEEE, Sep. 2021.
4. **D. G. Dansereau**, B. Girod, and G. Wetzstein, "LiFF: Light field features in scale and depth," in *Computer Vision and Pattern Recognition (CVPR)*. IEEE, Jun. 2019.
5. V. Varghese, **D. G. Dansereau**, M. Bryson, O. Pizarro, and S. B. Williams, "Light field image restoration for vision in scattering media," in *Image Processing (ICIP)*. IEEE, Oct. 2018.
6. A. Stewart and **D. G. Dansereau**, "Using planar point correspondence to calibrate camera arrays for light field acquisition," in *Australasian Conference on Robotics and Automation (ACRA)*. ARAA, Dec. 2017.
7. **D. G. Dansereau**, G. Schuster, J. Ford, and G. Wetzstein, "A wide-field-of-view monocentric light field camera," in *Computer Vision and Pattern Recognition (CVPR)*. IEEE, Jul. 2017, pp. 3757–3766.
8. **D. G. Dansereau**, A. Eriksson, and J. Leitner, "Richardson-lucy deblurring for moving light field cameras," *CVPR workshop on Light Fields for Computer Vision (CVPR:LF4CV)*, Jul. 2017.
9. G. M. Schuster, I. P. Agurok, J. E. Ford, **D. G. Dansereau**, and G. Wetzstein, "Panoramic monocentric light field camera," in *Intl. Optical Design Conference (IODC)*. OSA, Jul. 2017.
10. T. Hojnik, R. Lee, **D. G. Dansereau**, and J. Leitner, "Designing a robotic hopping cube for lunar exploration," in *Australasian Conference on Robotics and Automation (ACRA)*. ARAA, Dec. 2016.
11. H. Lu, Y. Li, X. Xu, L. He, Y. Li, **D. G. Dansereau**, and S. Serikawa, "Underwater image descattering and quality assessment," in *Image Processing (ICIP)*. IEEE, Sep. 2016.
12. **D. G. Dansereau**, S. P. N. Singh, and J. Leitner, "Interactive computational imaging for deformable object analysis," in *Robotics and Automation (ICRA)*. IEEE, May 2016.
13. J. Leitner, W. Chamberlain, **D. G. Dansereau**, M. Dunbabin, M. Eich, T. Peynot, J. Roberts, R. Russell, and N. Sünderhauf, "Lunaroo: Designing a hopping lunar science payload," in *IEEE Aerospace Conference*. IEEE, Mar. 2016.
14. **D. G. Dansereau**, D. Wood, S. Montabone, and S. B. Williams, "Exploiting parallax in panoramic capture to construct light fields," in *Australasian Conference on Robotics and Automation (ACRA)*. ARAA, Dec. 2014.
15. S. B. Williams, O. Pizarro, A. Friedman, M. Bryson, **D. G. Dansereau**, and N. N. Vatani, "Autonomous benthic monitoring – the Australian experience so far," in *Marine Imaging Workshop*, Southampton, UK, 2014.
16. **D. G. Dansereau**, O. Pizarro, and S. B. Williams, "Decoding, calibration and rectification for lenselet-based plenoptic cameras," in *Computer Vision and Pattern Recognition (CVPR)*. IEEE, Jun. 2013, pp. 1027–1034.
17. **D. G. Dansereau**, D. L. Bongiorno, O. Pizarro, and S. B. Williams, "Light field image denoising using a linear 4D frequency-hyperfan all-in-focus filter," in *Proceedings SPIE Computational Imaging XI*, Feb. 2013, p. 86570P.
18. D. L. Bongiorno, M. Bryson, **D. G. Dansereau**, S. B. Williams, and O. Pizarro, "Spectral characterization of COTS RGB cameras using a linear variable edge filter," in *Proceedings SPIE Digital Photography IX*, Feb. 2013, p. 86600N.
19. O. Pizarro, S. B. Williams, M. V. Jakuba, M. Johnson-Roberson, I. Mahon, M. Bryson, D. Steinberg, A. Friedman, **D. G. Dansereau**, N. Nourani-Vatani, D. Bongiorno, M. Bewley, A. Bender,

- N. Ashan, and B. Douillard, "Benthic monitoring with robotic platforms – the experience of Australia," in Intl. Underwater Technology Symposium. IEEE, 2013, pp. 1–10.
20. A. Madanayake, R. Wimalagunaratne, **D. G. Dansereau**, and L. T. Bruton, "A systolic-array architecture for first-order 4-D IIR frequency-planar digital filters," in Intl. Symposium on Circuits and Systems (ISCAS). IEEE, May 2012, pp. 3069–3072.
 21. —, "Design and FPGA-implementation of 1st-order 4D IIR frequency-hyperplanar digital filters," in Midwest Symposium on Circuits and Systems (MWSCAS). IEEE, Aug. 2011.
 22. **D. G. Dansereau**, I. Mahon, O. Pizarro, and S. B. Williams, "Plenoptic flow: Closed-form visual odometry for light field cameras," in Intelligent Robots and Systems (IROS). IEEE, Sep. 2011, pp. 4455–4462.
 23. **D. G. Dansereau** and S. B. Williams, "Seabed modeling and distractor extraction for mobile AUVs using light field filtering," in Robotics and Automation (ICRA). IEEE, May 2011, pp. 1634–1639.
 24. **D. G. Dansereau** and L. T. Bruton, "Gradient-based depth estimation from 4D light fields," in Intl. Symposium on Circuits and Systems (ISCAS), vol. 3. IEEE, May 2004, pp. 549–552.
 25. —, "A 4D frequency-planar IIR filter and its application to light field processing," in Intl. Symposium on Circuits and Systems (ISCAS), vol. 4. IEEE, May 2003, pp. 476–479.
 26. N. Chan, **D. G. Dansereau**, B. Davis, and B. Davies, "VHF impulse response measurements at 40 MHz," in Proceedings of Wireless 2000, vol. 1, Calgary, Alberta, Canada, 2000, pp. 133–145.

Workshop

1. N. Munasinghe, C. L. Gentil, J. Naylor, M. Asavkin, **D. G. Dansereau**, and T. Vidal-Calleja, "Towards event-based satellite docking: A photometrically accurate low-earth orbit hardware simulation," in International Conference on Robotics and Automation Workshop on Heterogeneous Multi-Robot Cooperation for Exploration & Science in Extreme Environments (ICRA:HERMES), 2024.
2. J. Wilkinson, J. Naylor, R. Griffiths, and **D. G. Dansereau**, "Adaptive keyframe selection for online iterative nerf construction," in International Conference on Robotics and Automation Workshop On Neural Fields In Robotics (ICRA:RoboNerF), 2024.
3. A. K. Taras, N. Suenderhauf, P. Corke, and **D. G. Dansereau**, "The need for inherently privacy-preserving vision in trustworthy autonomous systems," in International Conference on Robotics and Automation Workshops: Multidisciplinary Approaches to Co-Creating Trustworthy Autonomous Systems (ICRA: MACTAS), 2023.
4. **D. G. Dansereau**, "Is it possible to design optimal cameras for robotic vision?" Dagstuhl Seminar on Hyperspectral, Multispectral, and Multimodal (HMM) Imaging: Acquisition, Algorithms, and Applications, vol. 1, no. 2, p. 22, 2017.
5. **D. G. Dansereau**, S. B. Williams, and P. I. Corke, "Closed-form change detection from moving light field cameras," in IROS Workshop on Alternative Sensing for Robotic Perception. IEEE, Sep. 2015.
6. J. Leitner, **D. G. Dansereau**, S. Shirazi, and P. Corke, "The need for more dynamic and active datasets," in CVPR Workshop on The Future of Datasets in Computer Vision. IEEE, Jun. 2015.
7. A. Mallios, O. Pizarro, J. S. Arey, S. Samanipour, B. De Mol, N. Hurtós, M. Johnson-Roberson, **D. G. Dansereau**, L. Toohey, U. Lemmin, and R. Camilli, "Synoptic identification of greenhouse gas sources and sinks in lake Léman," in ASLO Aquatic Sciences Meeting, Granada, Spain, Feb. 2015.
8. O. Pizarro, S. Williams, M. Johnson-Roberson, M. Bryson, A. Friedman, **D. G. Dansereau**, and D. Rao, "Developments in sampling tools and techniques – a machine-centric viewpoint," in Geohab Workshop, Lorne, Victoria, 2014.
9. O. Pizarro, M. Jakuba, N. Flemming, D. Sakellariou, J. Henderson, M. Johnson-Roberson, I. Mahon, L. Toohey, **D. G. Dansereau**, and C. Lees, "AUV-assisted characterization of beachrock for-

mations in Vatika Bay and Laconia and Peloponnese and Greece and their relevance to local sea level changes and bronze age settlements,” in Ocean Sciences Meeting, 2012.

10. **D. G. Dansereau**, “Improved predistortion for harmonic upconversion in radio-on-fibre systems,” TRILabs Technology Forum, 1999.

Theses

1. **D. G. Dansereau**, “Plenoptic signal processing for robust vision in field robotics,” Ph.D. dissertation, Australian Centre for Field Robotics, School of Aerospace, Mechanical and Mechatronic Engineering, The University of Sydney, Jan. 2014.
2. — —, “4D light field processing and its application to computer vision,” Master’s thesis, Electrical and Computer Engineering, University of Calgary, Dec. 2003.

Other

1. H. Lu, J. Guna, and **D. G. Dansereau**, “Introduction to the special section on artificial intelligence and computer vision,” Computers & Electrical Engineering, vol. 100, no. 58, pp. 444–446, 2017.
2. **D. G. Dansereau**, G. Schuster, J. Ford, and G. Wetzstein, “A wide-field-of-view monocentric light field camera,” in Computational Photography (ICCP) Poster, May 2017.
3. D. Tsai, **D. G. Dansereau**, S. Martin, and P. Corke, “Mirrored light field video camera adapter,” Queensland University of Technology, Tech. Rep., Dec. 2016.
4. **D. G. Dansereau**, D. L. Bongiorno, M. Bryson, O. Pizarro, and S. B. Williams, “On the feasibility of multispectral contrast enhancement for aerial detection of sharks,” Australian Centre for Field Robotics, School of Aerospace, Mechanical and Mechatronic Engineering, The University of Sydney, Tech. Rep., Feb. 2014.

In Preparation

1. C. Yan and **D. G. Dansereau**, “TaCOS: Task-specific camera optimization with simulation,” under review, 2024.
2. R. Griffiths and **D. G. Dansereau**, “Adapting convnets for new cameras without retraining,” under review, 2024.
3. J. Naylor, V. Ila, and **D. G. Dansereau**, “Surf-NeRF: Surface regressed neural radiance fields,” under review, 2024.
4. A. Ravendran, M. Bryson, and **D. G. Dansereau**, “LBurst: Learning-based robotic burst feature extraction for 3D reconstruction in low light,” under review, 2024.

TEACHING AND MENTORSHIP

Lecturing

- Coordinator, Lecturer, USyd MTRX3760 Mechatronic System Design, 2018–
Co-created and developed this core 3rd-year mechatronics unit
Object-oriented design, C++, ROS, project management
Faculty Commendation for strong unit of study survey outcome, 2021–2022
- Coordinator, Lecturer, USyd MTRX1705 Introduction to Mechatronic Design, 2022–
Core 1st-year mechatronics unit
Digital and analog electronics, circuit design, sensors, actuators
- Co-organiser and lecturer, USyd AMME8700 Foundations of Robotics Research, 2020–
Co-organised and developed this graduate-level robotics unit
Lectures and lab on fundamentals of optics and computational imaging
- Guest lecturer, USyd AMME4710 Computer Vision and Image Processing, 2018–2021
- Guest lecturer, USyd MTRX3700 Mechatronics 3 (Embedded Software Design), 2021
- Guest lecturer, USyd ELEC3305 Digital Signal Processing, 2020
- Guest lecturer, Stanford EE368/CS232 Digital Image Processing, 2016
- Co-organiser, USyd MTRX4700/5700 Experimental Robotics, 37 students, 2014
Prepared and delivered lectures on introductory robotics, kinematics and dynamics
Developed new lab assignments and final exam questions

- Guest lecturer, USyd MTRX4700/5700 Experimental Robotics, 2012

Teaching Accreditations

- Supervisory Accreditation Level 1, QUT, Jul 2016
- Effective Supervisory Practices, 5-week HDR supervisor training, QUT, Oct 2015

Supervision and Mentorship

- Supervision of Postdoctoral Researchers: Jesse Mehami (2024–); Alexandre Cardaillac (2023–); Danish Khan (2022–2023)
- Supervision of PhD students: Ahalya Ravendran 2019–2023; Ryan Griffiths 2021–2024 (expected); Jack Naylor 2022–2025 (expected); Bhargava Gowda 2022–2025 (expected); Chengyang (Oliver) Yan 2022–2026 (expected); Nikolai Goncharov 2022–2026 (expected); Bina Rajan 2023–2027 (expected)
- Co-supervision of PhD students: Ze Krischer 2024–; Feiyu Wang 2019–2023; Dorian Tsai (QUT) 2016–2020;
- Supervision of USyd Undergraduate Research Internships: 60 students, 24 industry and university scholarships, 2 international placements, 2018–2023
- Supervision of USyd Undergraduate Honours Theses: 36 students, 6 engineering Sydney industry placement scholarships, 2018–2023
 - 4 undergraduate research articles in top venues (CVIU 2022, IROS 2021, Applied Optics 2021, ACRA 2022)
 - 1 undergraduate patent application, 2021
- USyd Dalyell mentorship scheme, 2020–
- Mentor for USyd Droid Racing Team, 2nd and 3rd place wins in this national event, 2019
- Stanford Raising Interest in Science and Engineering (RISE) and Summer Undergraduate Research Fellowship (SURF) for under-represented groups, Summer 2017
- Stanford Independent Studies / final-year projects: 12 projects, 2018, 2017
- QUT undergraduate research projects: 6 projects, 2015–2017
 - Light field fundus camera patent applied 2017, granted 2022
 - Two conference papers (ACRA 2017, 2016)

Teaching Assistant / Tutoring

- USyd MTRX4700/5700 Experimental Robotics laboratory, 2010–2013
 - Designed and oversaw assignments incorporating robotic arms and mobile platforms
 - Student-led group projects culminating in live demonstrations
 - Student rating of tutors in Unit of Study Evaluation: 4.7–5.0 / 5
- Teaching assistant, four programming and one telecommunications classes, UofC, 2001–2004

ADMINISTRATION, OUTREACH, AND PROFESSIONAL SERVICE

Administrative Roles

- University Academic Board Member, 2024–
- Associate Head of School (Research Education) / Postgraduate Coordinator, 2023–2024
- School Research Education Director / Postgraduate Coordinator, 2021–2022
- Mechatronics 3rd Year Advisor and Exchange Advisor, 2021–
- School International Director, 2021

Software and Tutorials

- Authored the open-source Light Field Toolbox for Matlab, 2013–present
 - >20k downloads, active online community, part of the Joint Photographic Experts Group (JPEG) light field workflow since 2016
- LFCamExplore light field camera design tool and tutorial, 2017
- LFSynth light field renderer, 2017

Community and Outreach

- Session Chair, ICRA 2024, IROS 2021
- Robotic Vision Summer School Local Chair (2021), Program Chair (2022-2024)
- Program Chair, ICVS (2023)
- Organiser, Robotic Imaging Reading Group, 2021–
- Restarted and organized SIRIS / ACFR Seminar series 2019–2021 and Twitter social media feed, 2019–present
- Program Chair, volunteer program: International Conference on Computational Photography (ICCP 2017)
- Program Committee:
 - International Conference on Computational Photography (ICCP 2019)
 - CVPR/ECCV Workshop on Light Fields for Computer Vision (LF4CV 2017, 2014)
 - Australasian Conference on Robotics and Automation (ACRA 2016)
 - RoboVis Science Symposium (2015)
 - CVPR Workshop on Computational Cameras and Displays (CCD 2015)
- Guest Editor:
 - Journal of Signal Processing: Image Communication special issue on Light Field Imaging, 2021
 - Computers and Electrical Engineering Journal special issue on Artificial Intelligence and Computer Vision, 2017
- Co-organizer of Stanford Imaging and Microscopy Reading Group, 2017, 2016
- Written contributions and revision of textbook “Robotics, Vision and Control”, 2nd Edition, 2016
- Designed and lead a robotic challenge student activity
 - Engineers Australia Autumn School, Toormina High School Visit, and National Computer Science School, Indigenous Australian Engineering Summer School, Engineers Australia Summer School, 2012–2014
- Founder and President of RoboMontreal amateur robotics club, 2006–2010
- Team captain, Waterloo Autonomous Robot Racing Challenge, 2007, 2008
- Electrical Engineering Student’s Council Member, 2001

Review

- Grant Reviewer:
 - Israeli Ministry of Innovation, Science and Technology, 2023
 - Dutch Research Council (NWO) Open Competition Domain Science, 2022
 - Australian Research Council Detailed Assessor, DECRA, Linkage, 2022
 - American National Science Foundation Small Project (NSF), 2017
 - Belgian Research Foundation – Flanders (FWO), 2017
- Candidature / Thesis Review Committee:
 - PhD Final Seminar Panel, QUT, 2020
 - PhD Thesis Examiner, University of Moratuwa, 2019
 - PhD Thesis Examiner, University of Queensland, 2018
 - University of Queensland Information Technology and Electrical Engineering, 2016–2017
 - University of Oulu Information Technology and Electrical Engineering, 2016
- Paper Reviewer:
 - Robotics: Science and Systems (RSS), 2024
 - European Conference on Computer Vision (ECCV), 2024, 2020, 2018
 - Transactions on Robotics (T-RO), 2024
 - International Conference on Robotics and Automation (ICRA), 2011–2024
 - Robotics and Automation Letters (RA-L), 2019–2024
 - Computer Vision and Pattern Recognition (CVPR), 2018–2024
 - International Conference on Computational Photography (ICCP), 2020–2024
 - International Conference on Intelligent Robots and Systems (IROS), 2024, 2018–2020, 2013
 - Multidimensional Systems and Signal Processing (MSSP), 2024

International Conference on Image Processing (ICIP), 2024, 2023
 International Conference on Computer Vision (ICCV), 2023, 2019
 Computer Vision and Image Understanding (CVIU), 2023, 2017, 2015
 Conference on Robot Learning (CoRL), 2022
 IEEE Transactions on Image Processing (TIP), 2019–2022, 2014
 Optics Express, 2018–2022, 2015
 Optics Communications, 2022, 2015
 Nature Scientific Reports, 2021
 International Conference on Learning Representations (ICLR), 2021
 British Machine Vision Conference (BMVC), 2021, 2019
 Optics Letters, 2020–2021
 Applied Optics, 2021, 2019
 Transactions on Graphics (TOG), 2020, 2016
 IEEE Journal of Selected Topics in Signal Processing (JSTSP), 2020
 SIGGRAPH, SIGGRAPH Asia, 2020, 2019, 2017
 Transactions on Computational Imaging (TCI), 2016–2019
 Autonomous Robots, 2018, 2011
 Transactions on Pattern Analysis and Machine Intelligence (TPAMI), 2018, 2015
 International Journal of Computer Vision (IJCV), 2017
 Australasian Conference on Robotics and Automation (ACRA), 2015, 2010
 IEEE Computer, 2014
 International Conference on Computer Vision Underwater Vision Workshop (ICCV-UV), 2013
 International Journal of Robotics Research (IJRR), 2012
 International Test Conference, 2007

Professional Organisations

- Member, Institute of Electrical and Electronics Engineers (IEEE), since 2005
- Junior Engineer, Ordre des Ingénieurs du Québec (OIQ), 2004–2010
- Engineer in Training (APEGGA), 2001–2004

VISITS

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- University of California, San Diego (UCSD), Photonic Systems Integration Laboratory: Monocentric light field camera characterization, decoding and processing, Feb 2017, Nov 2016
 - Australian Centre for Field Robotics, USyd: Underwater computational imaging, Feb 2017
 - Queensland University of Technology (QUT): Light field cameras and processing for robotic vision, co-supervision of 2 PhD and 2 undergraduate student projects, Feb–Mar 2017
 - University of Victoria (UVic), Multidimensional Signal Processing Group: Light field video filtering, July/Aug 2014
 - University of Rhode Island (URI), Graduate School of Oceanography, Ocean Engineering Lab: Underwater light field imaging tank experiments, Feb 2013
 - École Polytechnique Fédérale de Lausanne (EPFL): Sensor payload development and support for Project ELEM0, visual mapping and hydrochemistry in Lake Geneva, June 2011

INVITED TALKS AND SEMINARS

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- Robotic Vision Summer School Lecturer / Invited Speaker, Sydney / Canberra / Kioloa, 2020–2024, 2016
 - CMU Robotics Institute, Graphics, Visual Computing, and Computational Imaging Seminar, Pittsburgh, Jun 2022
 - IEEE Queensland/NSW Chapters and Queensland Centre for Robotics Invited Seminar, QUT, May 2022
 - Plenoptima Training School, Marie Skłodowska-Curie Innovation Training Network, Tampere University, Mar 2022

- Astralis Seminar, Australian Astronomical Optics, Macquarie University, Feb 2022
- Keynote Speaker at International Conference on Computer Vision Systems (ICVS), “Robotic Imaging: From Photons to Actions”, Sept 2021
- 86th Joint Photographic Experts Group (JPEG) meeting, “Why Roboticists Care about Light Fields (and Compression)”, Jan 2020
- McGill University, Centre for Intelligent Machines, May 2019
- University of Sydney Brain and Mind Centre, Imaging Physics Lab, Apr 2019
- Intel Visual and Experiential Computing Retreat, Oct 2018, Dec 2016
- Plenary Speaker at 3DTV Conference, Stockholm, Jun 2018
- IEEE SPS Summer School and ETN-FPI Training School on Light Field Data Representation, Interpretation, and Compression, Mid Sweden University in Sundsvall, May 2018
- Monash University, Intelligent Robotics Group, Jan 2018
- University of New South Wales, Dept. of Mechanical and Manufacturing Engineering, Jan 2018
- University of Sydney, Centre for Robotics and Intelligent Systems, Jan 2018
- University of Technology Sydney, Centre for Autonomous Systems, Jan 2018
- Max Planck Institut Informatik, “Computational Imaging for Robotic Vision”, Oct 2017
- Schloss Dagstuhl Seminar on Hyperspectral, Multispectral, and Multimodal Imaging, Oct 2017
- Berkeley Center for Computational Imaging, Sep 2017
- CVPR Computational Cameras and Displays workshop invited talk, “A Wide Field-of-View Monocentric Light Field Camera”, Jul 2017
- Stanford Center for Image Systems Engineering Affiliates colloquium, Jun 2017
- QUT Robotics and Autonomous Systems, Feb 2017
- UQ Robotics, Feb 2017
- Stanford Graphics Cafe, “Robotic Computational Imaging”, Nov 2016
- QUT Robotics and Autonomous Systems, Mar 2016
- Lytro Invited Talk, Aug 2015
- Stanford Computer Graphics Laboratory, Aug 2015
- QUT Robotics and Autonomous Systems, Jul 2015
- University of Victoria Invited Seminar, IEEE OES Victoria Chapter and UVic ECE, Aug 2014
- ANU, RoboVis ACRV Science workshop, Nov 2014
- University of Calgary, “Light Field Imaging with Applications in Underwater Robotics”, Feb 2013
- URI, “Light Field Imaging with Applications in Underwater Robotics”, Feb 2013
- WHOI, “Underwater Hyperspectral and Light Field Imaging”, Feb 2013
- RSS Invited Interactive Poster, “Light Fields for Robot Vision”, Jul 2012

MEDIA COVERAGE

- Nine News, MSN, TechXplore and others “New privacy-preserving robotic cameras obscure images beyond human recognition”, Apr 2024
- GoAuto interview, Feb 2023
- OSA Spotlight on Optics, “Panoramic single-aperture multi-sensor light field camera”, Jan 2020
- Engadget, “Stanford built a ‘4D’ camera for cars, robots and VR”, July 2017
- Indian Express, “Stanford scientists created new 4D camera that could boost robot vision, virtual reality”, July 2017
- Daily Mail, “Stanford researchers reveal first-of-its-kind 4D camera that will give drones and self driving cars ‘supervision’”, July 2017
- IEEE Future Directions, “4D digital camera for robotic vision”, July 2017
- Robotics and Automation News, “Stanford boffins invent 4D camera to improve robotic vision and augmented and virtual reality specs”, July 2017
- CGTN News, “Stanford engineers design 4D camera for robots”, July 2017
- Xinhuanet News, “Stanford engineers design 4D camera for robots”, July 2017

- Other appearances: Stanford News, UCSD News, RoboticVision.org, Futurity, Technology.org, The Merkle, Inverse, Interesting Engineering, Singularity Archive, GetVR, BT, Campus Technology, The University Network, Science News for Students, and DZone, 2017

SELECTED FIELD WORK

- Western Australia 2014: Integrated Marine Observation System (IMOS) and National Environmental Research Program (NERP) benthic monitoring; AUV operations and support
- Nautilus 2013: Marine geology, biology and seamount exploration in the Greater Antilles and Montserrat; lead navigator, ROV-based operations and support, training of new navigators
- Lake Geneva 2011: Project ELEMOS, exploration, visual mapping and hydrochemistry; operations and support for a manned submersible-mounted imaging system
- Pavlopetri 2011: Underwater archaeology, imaging and survey on a submerged town in Laconia, Greece; operations and support for AUV and diver-driven visual survey
- Nautilus 2011: Marine geology, hydrothermal vent exploration and seamount mapping in the Sea of Crete and Aeolian Arc; navigator, ROV-based mapping operations and support
- Tasmania 2010: IMOS benthic monitoring; AUV operations and support