

Professor Bruce MacDonald, PhD

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Born on August 17, 1958 in Taupo (New Zealand)



Scientific Career

- Since 2010 Associate Professor, Department of Electrical and Computer Engineering, The University of Auckland
- Since 2010 Research theme leader for Technologies for Health, Faculty of Engineering
- Since 2008 Scientific advisor for Ovine Automation Ltd's Science and Commercialisation Group
- 1995 - 2010 Senior Lecturer, Department of Electrical and Computer Engineering, The University of Auckland
- 1991 - 1995 Associate Professor, Department of Computer Science, The University of Calgary, Canada
- 1985 - 1991 Assistant Professor, Department of Computer Science, The University of Calgary, Canada
- 1989 Visiting Lecturer, Electrical and Electronic Engineering Department, Canterbury University, New Zealand
- 1985 Scientist, Physics and Engineering Laboratory, Wellington, New Zealand
- 1982 - 1985 Assistant Engineer, Ministry of Energy, Wellington, New Zealand
- 1979 - 1983 PhD In robotics and machine learning, Department of Electrical Engineering, University of Canterbury, New Zealand
- 1976 - 1978 B.E. (Elect) 1st class hons, Department of Electrical Engineering, University of Canterbury, New Zealand

Scholarships, Awards and Faculty Functions

- Since 2016 Theme leader for Sensing, Robotics and Automation, New Zealand National Science Challenge for Technological Innovation.
- Since 2014 Founding chairman of NZ Robotics, Automation and Sensing Association
- Since 2011 Co-chair IEEE technical committee on software engineering for robotics
- Since 2008 Editorial Board of the Journal of Software Engineering for Robotics
- Since 2006 Editorial consultant board for the Journal of Advanced Robotic Systems

Ten most important publications

* Publications jointly together with UoA-researchers involved within this IRTG

§ Publications jointly together with USTUTT-researchers involved within this IRTG

A) Published in publication outlets with scientific quality assurance and book publications:

1. Broadbent, E.; Stafford, R.M.Q.; MacDonald, B.A.: Acceptance of healthcare robots for the older population: Review and future directions. International Journal of Social Robotics, 2009(1), p. 319-330, 2009.
2. Yuen, D.C.K.; MacDonald, B.A.: Vision-based localization algorithm based on landmark matching, triangulation, reconstruction, and comparison (2005). IEEE Transactions on Robotics, 21 (2), p. 217-226, 2005.
3. Broadbent, E.; Kuo, I.H.; Lee, Y.I.; Rabindran, R.; Kerse, N.; Stafford, R.; MacDonald, B.A.: Attitudes and reactions to a healthcare robot. Telemedicine and e-Health, 16 (5): p. 608-613, 2010.
4. Collett, T.H.J.; MacDonald, B.A.: An Augmented Reality Debugging System for Mobile Robot Software Engineers. Journal of Software Engineering for Robotics, 1(1), p. 18-32, 2009.
5. Biggs, G.M.; MacDonald, B.A.: A pragmatic approach to dimensional analysis for mobile robotic programming. Autonomous Robotics, 25(4), p. 405-419, 2008.
6. Rodriguez-Canosa, G. R.; Thomas, S.; del Cerro, J.; Barrientos, A.; MacDonald B.A.: A real-time method to detect and track moving objects (DATMO) from unmanned aerial vehicles (UAVs) using a single camera. Remote Sensing, 4(4), p. 1090-1111, 2012.
7. Chen I.; MacDonald, B.A.; Wunsche, B.: A Flexible Mixed Reality Simulation Framework for Software Development in Robotics. Journal of Software Engineering for Robotics, 2(1), p. 40-54, 2011.
8. Kozlov A.; MacDonald, B.A.; Wünsche B.C.: Design and analysis of visualization techniques for mobile robotics development. Journal of WSCG, 20(2), p. 107-116, 2012.
9. Thomas S.J.; MacDonald, B.A.; Stol K.A.: Real-Time Robust Image Feature Description and Matching. Book chapter in Computer Vision – ACCV 2010 (Eds: Kimmel, Klette, Sugimoto), Lecture Notes in Computer Science, 6493, p. 334-345, 2011.

B) Other publications

10. Thomas, S.; MacDonald, B.A.; Stol, K.: Robust Single Camera Relocalisation in Large-Scale Environments. Proceeding of the Twenty-sixth International Conference Image and Vision Computing, 6 pages, 2011.

C) Patents

Supervised graduate students since graduation year 2011

No.	Last Name, First Name	Degree	Title of the dissertation	Duration of thesis
1	Chen, Ian	PhD	Mixed reality simulation for mobile robots	2007-2011
2	Kozlov, Alex	PhD	Augmented reality for visualisation of robot navigation algorithms	2007-2011
3	Kuo, Tony	PhD	Designing Human-Robot Interaction for Service Applications	2007-2012
4	Datta, Chandan	PhD	Programming Behaviour of Personal Service Robots with Application to Healthcare	2010-2014
5	Diprose, Jamie	PhD	Visual language design in robotics	2011 -
6	Bell, Jamie	PhD	Orchard robot navigation	2014 -
7	Lee, Minho (Chris)	PhD	Robotic software reuse	2015 -
8	Droppers, Lloyd	PhD	Dynamics of precision sprays and droplet stream impacts	2016 -
9	Chigateri, Nethra G.	PhD	Accelerometer based activity analysis	2016 -
10	Nejati, Mahla	PhD	Machine vision methods for flower and fruit recognition	2016 -

Most important research grants since 2011

No.	Research Project	Funding Period	Name(s) of the principal investigator(s)	Funding source and reference number
1	Tracking and visualisation of piece picking operations by humans.	2011	MacDonald, B.	Daifuku, Japan
2	For development of international funding for the university wide robotics research group. NZ\$150K plus 1/3 research developer for three years.	2010 - 2013	MacDonald, B.	University of Auckland, Vice-Chancellor's Strategic Development Fund
3	Image Detection for apples	2012	MacDonald, B.	NMI Design Solutions Limited
4	Empower the elderly with a lightweight robot arm.	2014 - 2017	MacDonald, B.	NZ Ministry of Business, Innovation and Employment. UOAX1312

5	Multipurpose orchard robotics. \$8.8M. UoA role is using machine vision for tracking fruit and flowers.	2014-2018	MacDonald, B.	NZ Ministry of Business, Innovation and Employment. UOAX1414
6	Multipurpose orchard robotics project industry co-funding. \$800K	2014-2018	MacDonald, B.	Robotics Plus Ltd.
7	Robotic technologies for social well-being: A cross-faculty research initiative to develop inspiring and innovative robotic technologies that improve societal well-being. \$660K.	2015-2019	MacDonald, B.	University of Auckland. Strategic Research Investment Fund. 3708051.
8	Dementia robot development. \$800K	2016-2020	MacDonald, B.	Ewha Womens University, South Korea
9	National Science Challenge: Science for Technological Innovation: Kia kotahi mai-te ao pūtaiao me tea o hangarau. \$39M. B MacDonald role in subcontract Sensors, robotics and automation - Theme Leader on the management team for \$263K 2015-2019.	2015-2019	Hyland, M. (overall project) MacDonald, B. (subcontract).	NZ Ministry of Business, Innovation and Employment. CINN01502. Subcontract from Callaghan Innovation IEA-2015-BM01.