November 6, 2023

Robert R. Bitmead — Curriculum Vitæ

Current Position and Work Address:

Distinguished Professor,
Department of Mechanical and Aerospace Engineering,
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Date and Place of Birth: April 10, 1954. Sydney, NSW, Australia.

Nationality: Dual Australian-US.

Marital Status: Married with two independent children.

Academic Qualifications:

1980: PhD in Electrical Engineering, University of Newcastle, Australia.
Thesis title: Convergence properties of discrete-time stochastic adaptive estimation algorithms.

1977: ME in Electrical Engineering, University of Newcastle, Australia.
Thesis title: Matrix transfer function description of linear systems.

1976: BSc (Hons I) in Applied Mathematics, University of Sydney, Australia.
Thesis title: A survey of past work and current trends in problems concerning stability in a sector for deterministic control systems: the problems of Lur'e and Aizerman.

Academic Appointments:

July 2012 – present, Distinguished Professor of Mechanical & Aerospace Engineering, University of California San Diego.

July 1999 – June 2012, Professor of Mechanical & Aerospace Engineering, University of California San Diego.

July 2009 – June 2010, July 2013 – June 2015, Vice-chair Department of Mechanical & Aerospace Engineering.
October 2006 – September 2009, Associate Vice-Chancellor for Academic Personnel.
December 2001 – December 2017, Cymer Corporation Endowed Chair in High-Performance Dynamical Systems

and Control.

April-December 2023, SimTech Visiting Professor, University of Stuttgart.
January-July 2018, Visiting Professor, Norwegian University of Science & Technology.
May 2011, Visiting Professor, University of Melbourne.
January 2011 - April 2011, Visiting Professor, Institut für Automatik, ETH Swiss Federal Institute of Technology, Zurich.
September 2010, Visiting Professor, Dipartimento di Elettronica e Informazione, Politecnico di Milano.
August 2007 – Visiting Professor, Department of Engineering Cybernetics, Norwegian University of Science and Technology (NTNU), Trondheim, Noway.

May 2003 – August 2003, Visiting Professor, Department of Systems Science, Graduate School of Informatics, Kyoto University, Japan.

March 1995 – July 1999, Professor of Systems Engineering, Research School of Information Sciences and Engineering, Australian National University.

July 1991 – June 1999, Executive Director of Cooperative Research Centre for Robust and Adaptive Systems, combining ANU, Australian Defence Science and Technology Organisation, Boeing, and BHP Research Pty Ltd.

July 1987 – March 1995, Senior Fellow of Systems Engineering, Research School of Information Sciences and Engineering, Australian National University. (Prior to January 1, 1994, Research School of Physical Sciences and Engineering.)

October 1994 – January 1995, Professeur Invité, Institut National de Recherche en Informatique et en Automatique, Sophia-Antipolis, France.

May 1988 – December 1988, Chargé de Cours Invitée, Laboratoire d'Automatique, Université Catholique de Louvain. Louvain-la-Neuve, Belgium.

December 1982 – June 1987, Fellow in Systems Engineering, Research School of Physical Sciences, Australian National University.

July 1984 – December 1984, Visiting Assistant Professor, School of Electrical Engineering, Cornell University, Ithaca, New York USA.

February 1980 – December 1982, Lecturer in Electrical Engineering, James Cook University of North Queensland, Townsville, Australia.

May 1979 – February 1980, Australian Research Grants Committee Research Associate in Electrical Engineering, University of Newcastle, Australia.

Teaching Experience:

Courses on: Control Systems, Network Theory, Communications Systems, Digital Signal Processing, Optimization Techniques, Microprocessor Systems, Stochastic Processes, Adaptive Estimation, System Identification, Linear Control Design.
UCSD: MAE40/140 Linear Circuits, MAE143A Signals and Systems, MAE143B Linear Control, MAE143C Digital Control, MAE280A Linear Systems Theory, MAE280B Linear Control System Design, MAE283A Parametric Identification: Theory and Methods, MAE283B Approximate Systems Identification and Control, MAE285 Optimal Control and Estimation, MAE288A Optimal Control, MAE288B Optimal Estimation, MAE289A Real Analysis for Applications.

Postgraduate Student Supervision:

Phillip C.V. Musumeci, MEngSci, *Automatic control of base cutter height on sugar cane harvesters,* James Cook University of North Queensland, completed 1983.
Iven M.Y. Mareels, PhD, *Dynamics of adaptive control,* Australian National University, completed 1986.
Philip Parker, PhD, *Frequency domain descriptions of linear systems,* Australian National University, completed

1988.
Rodney A. Kennedy, PhD (joint), *Operational aspects of decision feedback amplifiers,* Australian National University, completed 1988.
Wei-Yong Yan, PhD, *Robust control and periodic control,* Australian National University, completed 1990.
Michael R. Frater, PhD (joint), *Estimation of the statistics of rare events in data communications systems,* Australian National University, completed 1991.
Peter J. Kootsookos, PhD, *FIR(q) filter designs,* Australian National University, completed 1991.
Salvatore Crisafulli, PhD, *Adaptive speech coding via feedback techniques,* Australian National University, completed 1992.
Zhuquan Zang, PhD, *Performance, analysis and enhancement of adaptive control systems,* Australian National University, completed 1992.
John P. Homer, PhD (joint), *Adaptive echo cancellation in adaptive communications,* Australian National University, completed 1994.
Barbara F. La Scala, PhD, *Approaches to frequency tracking and vibration control,* Australian National University, completed 1994.
Craig R. Watkins, PhD, *New techniques in signal coding,* Australian National University, completed 1994.
Ari G. Partanen, PhD, *Controller refinement with application to a sugar cane crushing mill,* Australian National University, completed 1995.
Jenny Fulton, MEng, *Smoothing techniques for the reconstruction of missing samples,* Australian National University, completed 1997.
Allan J. Connolly, PhD (joint), *The design and synthesis of narrow band disturbance rejection controllers,* Australian National University, completed 1997.
Leonardo Kammer, PhD, *Performance monitoring and assessment under and LQ criterion,* Australian National University, completed 1998.
Gordon Sutton, PhD, *Nonlinear model predictive control design,* Australian National University, completed 1999.
Wayne J. Dunstan, PhD, *Nonlinear System Identification with application to combustion instability,* University of California, San Diego, completed 2003.
C. William Cooper, PhD, *Channel Allocation in Wireless Networks,* University of California San Diego, completed May 2004.
Sangho Ko, PhD, *Performance Limitations in Linear Estimation and Control: Constraint and Quantization Effects,* University of California, San Diego, completed March 2005.
Jun Yan, PhD, *Constrained Model Predictive Control, State Estimation and Coordination,* University of California, San Diego, completed April 2006.
Chengjin Zhang, PhD, *State-Space Models and Methods for MIMO Communications,* University of California, San Diego, completed September 2006.
Jisang Park, PhD, *Controller Certification: The Generalized Stability Margin Inference for a Large Number of MIMO Controllers,* University of California, San Diego, completed January 2008.
Keunmo Kang, PhD, *Information in Coordinated System Control,* University of California, San Diego, completed September 2008.
Andrew Reizhi Liu, PhD, *Stochastic observability, reconstructibility, controllability and reachability,* University of California, San Diego, July 2011.
Seunggyun Cheong, PhD, *Assessment of Prospective Controllers: Data-based Approaches Tailor-made for Current Knowledge,* University of California, San Diego, July 2012.
Daniel J. Riggs, PhD, *Performance-driven Control Theory and Applications,*University of California, San Diego, September 2012.
Chad Holcomb, PhD, *Diagnostics and Control of Gas Turbines through System Identification,* University of California, San Diego, January 2015.
Minh Hong Ha, PhD, *Cost of Adaptation in Poer Control of Communication Systems,* University of California, San Diego, June 2015.

Chun-Chia Huang, PhD, *State estimation with imperfect communications: escape time formulation and exact quantized-innovations filtering,* University of California, San Diego, June 2015.
Robert Moroto, PhD, "Leveraging Prior Knowledge for Performance Improvement in Control, Estimation, and Identification," University of California, San Diego, June 2017.
Martin Sehr, PhD, "Healthcare Decision Making and Stochastic Model Predictive Control: Output-Feedback, Optimality, and Duality," University of California, San Diego, June 2017.
Aditya Zadgaonkar, MS Thesis, "Estimating Droplet Displacement Induced by Local Plasma Force," University of California, San Diego, May 2020.
Behrooz Amini, PhD, "LQG Control Performance under Coding Strategies in Network Control Systems," University of California, San Diego, May 2020.
Abhijeet Patil, MS Thesis, "Mutual Information Based Evaluation of Data Set Quality," University of California, San Diego, December 2020.
Mohammed Alyaseen, MS Thesis, "Simultaneous Input and State Estimation Stability," University of California, San Diego, May 2021.
Sven Brüggemann, PhD, "Control-Oriented Modeling and Model-Based Control of Gas Processing Facilities," University of California, San Diego, December 2022.
Mohammad Ramadan, PhD, "State Estimation for Control," University of California, San Diego, April 2023.
Soren Almquist, MS Thesis, "System Identification and Modeling for Control of a High Power Drive Laser," University of California, San Diego, November 2023.
Varun Ramadurai, MS Thesis,"MIMO Process control for Compressor Systems with Recycled Flow," University of California San Diego, January 2024.
Shruthi Nagabhushana, PhD, University of California, San Diego, current.

Areas of Interest and Research:

Adaptive Processes, Adaptive Control, Signal Processing, Telecommunications, Stability Theory, Nonlinear Dynamical Systems, Stochastic Processes, Control System Design, System Identification, Industrial Applications, Model Predictive Control, Control Systems in Healthcare Delivery, State Estimation, Modeling for Control.

Fellowships and Grants Received:

Solar Turbines "Parametrized Modular Modeling for System Design," 2019-2024.
Solar Turbines "Dynamic compensation of preview fuel variations in power plant control," 2014-2017.
NSF Grant "Costs and Benefits of Adaptation: evaluation in network congestion control," 2011-2014.
Solar Turbines "System Identification and Advanced Model Based Control of Solar Turbine Systems," 2011-2014.
STTR Grant "Adaptive Fleet Synthetic Scenario Research," via KAB Laboratories 2010-2013.
SBIR Grant "Fleet-Wide Variability for an Integrated Flight and Propulsion System," via SC Solutions and Impact Technologies, 2005-2008.
STTR Grant "Automated RF Measurement Module," via KAB Laboratories, 2005-2008.
AFOSR Grant "Control and Information Architecture for Coordinated Networked Systems," 2005-2009.
NSF Grant "Collaborative Research: Objective-Oriented Mobile Heterogeneous Sensor Networks for Coordinated Control," 2003-2005.
NSF Grant "Nonlinear System Identification with Application to Combustion Instability Control," 2002-2005.
Ericsson contract "Multiple Antenna Systems for Wireless Communications," 2002-2006.
NSF Grant "Complexity and Experiment Design in Identification for Control", 2000-2002.
DARPA Grant "Advanced System Design with Composite Tensegrity Materials", 2000-2002.
Cooperative Research Centre Grant (First Round), 1991-1999.
CSR Sugar Mill Control Project Grant, 1989-1998.
Ministère de l'Enseignement Supéieure et de la Recherche (France) grant 1994-1995.
Australian Telecommunications and Electronics Research Board Grant, "Adaptive Quantizers in Communications

Systems" 1989-92.
Australian Telecommunications and Electronics Research Board Grant (joint), "Modelling of Rare and Damaging Events in Packet Switched Networks" 1988-91.
Australian Telecommunications and Electronics Research Board Grant, "Stochastic Dynamics of Decision Feedback Equalizers" 1986-9.
Centre for Information Sciences Research (ANU) Grant for the appointment of a Research Fellow in Telecommunications, 1988.
Australian Department of Defence Grant, co-investigator, "Kalman Filtering Techniques for Towed Array Shape Estimation", 1984-6.
Visiting Professor, School of Electrical Engineering, Cornell University, USA, 1984.
Radio Research Board Grant, "Nonparametric Techniques for Adaptive Filtering and Control", 1983-6.
US/Australia Cooperative Science Program Grant for study in USA, 1984.
Fulbright Award for Postgraduate study at Stanford University, Information Systems Laboratory, 1977.

Professional Society Memberships and Boards:

Chair, IFAC President's Task Force, 2023-24.
Nominating Committee, IEEE Control Systems Society, 2022-23.
Immediate Past President, IEEE Control Systems Society, 2020.
President, IEEE Control Systems Society 2019.
President-Elect, IEEE Control Systems Society 2018.
Vice-President for Financial Activities, IEEE Control Systems Society 2015-2016.
Member, IEEE Technical Activities Board, 2019.
Board of Governors, IEEE Control Systems Society, 2013-2015, 2018-2020.
Board of Directors, American Automatic Control Council, 2019.
Chair, IEEE Control Systems Society Nominating Committee, 2020.
Chair, IEEE Control Systems Society Long-Range Planning Committee, 2019.
Chair, IFAC Fellow Evaluation Committee, 2014-2017.
Chair, IFAC Fellow Search Committee, 2017-2020.
Member, IFAC Publications Committee, 2017-present.
Member IEEE Awards Planning and Policy Committee, 2012-2013.
Member IEEE Recognitions Council, 2010, 2011.
Fellow of the International Federation of Automatic Control, 2005.
Fellow of the Australian Academy of Technological Sciences & Engineering, 1999.
Fellow of the Institute of Electrical and Electronics Engineers, 1991.
Citation: "For contributions to the development of the theory of adaptive control and filtering."
Fellow of the Institution of Engineers, Australia, 1994-2013.
Member IEEE Control Systems Society Awards Committee, 2007-09. This committee was charged with recommending the recipient of the IEEE Control Systems Field Awards, the highest career award of the Society.
Member IEEE Prize Papers and Scholarships Committee, 2008-09. This committee recommends the award of Donald G. Fink Prize for the best survey, review or tutorial paper published anywhere in the archival IEEE literature. It also recommends recipients of the Charles LeGeyt Fortescue and Life Member scholarships.
Chair 2010-2011, IEEE Prize Papers and Scholarship Committee.
Member, IFAC Prize Paper Selection Committee, 2006-2008. This committee was charged with recommending the best papers from *Automatica* during the triennium in the categories of survey, theory/methodology, applications.
Council Member, International Federation of Automatic Control, 1996-2002.
Technical Board Member, International Federation of Automatic Control, 1990-1996.
Chairman of the International Federation of Automatic Control, Coordinating Committee on Control Design, 1993-1996.
Chairman of the International Federation of Automatic Control Technical Committee on Mathematics of Control

1990-1993.
Vice-Chairman of the International Federation of Automatic Control Technical Committee on Mathematics of Control, 1987-1990.
Member International Federation of Automatic Control Technical Committee on Theory, 1986-1996.
Chairman, IEEE Control Systems Society Fellow Evaluation Committee, 1995.
Member International Committee of the IEEE Control Systems Society.
Member IFAC Working Group on Adaptive Systems and Signal Processing.
Member National Committee on Automation, Control and Instrumentation (NCACI), Institution of Engineers, Australia, 1994-2003.
Chairman, IFAC Sub-committee of NCACI.
Chairman, Australian Capital Territory Section of the Institute of Electrical and Electronics Engineers, 1993-1994.

Editorships:

Foundation Editor-in-Chief, *IFAC Journal of Systems and Control* 2017-2023.
Editor for Adaptive & Intelligent Control, *Automatica,* January 2002-December 2005.
Foundation Editor (Adaptive Control Theory), *International Journal of Adaptive Control and Signal Processing,* 1987-1992.
Associate Editor, *Automatica*, 1989-1993.
Associate Editor, *IEEE Transactions on Automatic Control*, 1984-1986.

Conference Activities:

General Chair, IEEE Conference on Control Technology and Applications, San Diego, 2025.
Program Chair, IFAC Symposium on System Identification, Brussels, Belgium, 2012.
General Chairman, IEEE Conference on Decision and Control, Sydney, 2000.
Program Chairman, IFAC Symposium on Adaptive Control and Signal Processing, Glasgow UK, 1998.
Technical Chairman, International Symposium on Signal Processing and its Applications, Gold Coast, 1990.
Vice-Chairman, International Program Committee, IFAC International Symposium on Adaptive Systems in Control and Signal Processing, Grenoble 1992.
Vice-Chairman of Program Committee, IEEE Conference on Decision and Control, Tucson AZ, 1992.
IFAC System Identification Symposium, International Program Committee, Rotterdam 2003.
European Control Conference Porto 2001 International Program Committee.
European Control Conference Cambridge 2003 International Program Committee.
IFAC Workshop on Adaptive Control and Signal Processing Como 2001 International Program Committee.
Member International Program Committee, IFAC International Symposium on Adaptive Systems in Control and Signal Processing, Budapest 1995.
Member Technical Committee, International Symposium on Signal Processing and its Applications, Gold Coast, 1992.
Member Technical Program Committee, IEEE International Workshop on Intelligent Signal Processing and Communications Systems, Taipei 1992.
Member International Program Committee, IFAC Symposium on Identification and System Parameter Estimation, Budapest 1991.
Member International Program Committee, IFAC Symposium on Adaptive Control and Signal Processing, Glasgow, 1989.
Member International Program Committee, Identification '88, Beijing, 1988.
Member Technical Committee, International Symposium on Signal Processing and its Applications, Brisbane, 1987.
Member International Program Committee, IFAC Workshop on Robustness Issues in Adaptive Control, Newcastle, 1988.

Honours:

2021 IEEE Control Systems Society Distinguished Member Award.
2015 IEEE Control Systems Society Transition to Practice Award, *for advanced control applications in a range of industry sectors where each has involved innovation in theory to achieve the practical outcome.*
2014 ASME Rufus Oldenburger Medal, *for sustained contributions, in both theory and application, to joint system modeling and control design; and for work that has had major impact on model predictive control and controller certification based on experimental data.*
2002 International Federation of Automatic Control Outstanding Service Award *for sustained outstanding performance in major leadership positions in IFAC.*
2002 Inaugural Cymer Endowed Chair for high performance dynamical systems modeling and control.
2001-2006 IEEE Control Systems Society Distinguished Lecturer.
1994 Vice-Chancellor's Award for Excellence in Teaching, Australian National University.
1993 Finalist in the triennial IFAC Applications Prize Paper Award for the paper A.G. Partanen and R.R. Bitmead, "Excitation versus control issues in closed loop identification for a sugar cane crushing mill," *IFAC World Congress Sydney*.
1990 IFAC citation for paper I.M.Y. Mareels and R.R. Bitmead, "Nonlinear dynamics in adaptive control: periodic and chaotic stabilization. Part II: analysis", *Automatica*, vol. 24, No. 4, July 1988, pp. 485-497.
1989 Australian Telecommunications and Electronics Research Board Medal.

Consultancies:

Skyryse, El Segundo, California, USA. Aerospace.
Freeport-McMoRan, Phoenix, Arizona, USA. Mining, minerals processing
Cymer Corporation, Rancho Bernardo, California, USA. Semiconductor photolithography.
CSR Sugar Mills Group, Ingham, Queensland, Australia. Sugar.
BHP Steel, Port Kembla, New South Wales, Australia. Steel, mining.
MOOG Inc, East Aurora, New York, USA. Aerospace, hydraulics.
United Technologies Research Center, East Hartford, Connecticut, USA. Engineering.
General Electric Global Research Laboratories, Niskayuna New York USA. Engineering.
Australian Federal Police Technical Section, Canberra Australia. Police.
Pratt and Whitney, East Hartford, Connecticut, USA. Aircraft engines.
Polaris Wireless Inc., Santa Clara, California, USA. Mobile wireless.