

ABBREVIATED CURRICULUM VITAE

BRIAN DO ANDERSON

FULL NAME Brian David Outram ANDERSON

CITIZENSHIP Australian

CURRENT APPOINTMENT

Distinguished Professor (*since 2016*)

Hangzhou Dianzi University,
China

Emeritus Professor (*Professor, Distinguished Professor 1981-2016*)

Research School of Engineering,
The Australian National University
Canberra, ACT 0200, Australia

Distinguished Researcher

Data 61-CSIRO (previously NICTA) (*President, 2002-3, Chief Scientist
2003-6*)

DEGREES

- BSc (1962), BE (1964) (Syd) PhD in Elec Eng Stanford (1966)
- 7 honorary doctorates (5 Australian, 2 foreign including ETH Zurich)

CIVIL DECORATIONS

- Commander of the Order of Australia, 2016 (Officer, 1993)
- Order of the Rising Sun (Japan), 2007
- Centenary Medal, Government of Australia 2001

OTHER EXPERIENCE

- Academic staff member at Stanford University, CA (1966-1967),
University of Newcastle, Australia (1967-1981)
- Many visiting professorships at leading international universities,
including Stanford, Berkeley, Kyoto, Imperial College, ETH.
- Company director experience
- Consulting in a wide variety of companies in Australia and abroad
- Service on numerous government committees and boards related to
science and technology, and participation in and leadership of
government enquiries
- President of International Federation of Automatic Control (1990-
1993), Australian Academy of Science (1998-2002)
- Many past and current journal editorial positions

PRIZES, AWARDS AND DISTINCTIONS

- Fulbright Grant, 1964, 1970, 1977
- Senior Prize for Best Paper, IEEE Trans on Acoustics, Speech and Signal
Processing, 1986

- Kelvin Premium, IEE, 1989
- Institution of Engineers, Australia, Electrical College Eminent Speaker 1990-1991
- Flinders Lectureship and Medal, Australian Academy of Science, 1992
- Guillemin-Cauer Award, IEEE Circuits and Systems Society, 1992
- IEEE Control Systems Society Bode Prize, 1992
- Vice-Chancellor's Award for Excellence in Teaching, The Australian National University, 1994
- International Award of Society for Materials Engineering for Resources of Japan, 1994
- Life Adviser, International Federation of Automatic Control, 1996
- IEEE Control Systems Award, 1997
- Guest of Honour, World Automation Congress (WAC'98), Alaska, USA, 1998
- Quazza Medal, IFAC, 1999
- Best Paper Prize, Automatica, 1999
- Named by ISI as one of the most highly cited scientists in the world within the category of engineering for the period 1981-1999
- Honourable Professor, Harbin Institute of Technology, China, 2000
- Distinguished Lecturer, IEEE Control Systems Society, 2001
- IEEE James H Mulligan Jr Education Medal, 2001
- Guillemin-Cauer Award, IEEE Circuits and Systems Society, 2001
- MA Sargent Medal, Institute of Engineers, Australia, 2002
- Asian Control Professors Association Education Award, 2002
- Chancellor's Special Commendation and Medal, The Australian National University, 2004
- Commendation of Foreign Minister of Japan 2006
- Best Paper Prize, Asian Journal of Control (2006-2008), 2009
- Best Paper Prize (Guan Zhao-Zhi Award), Chinese Control Conference 2015
- John R Raggazini Education Prize, American Control Council, 2016.

DOCTORAL STUDENTS

I have successfully supervised approximately 45 research student theses

Many of the students have gone on to hold senior appointments, fellowships, etc

MEMBERSHIP OF LEARNED SOCIETIES

- Australian Academy of Science (Fellow-1974)
- Institute of Electrical and Electronics Engineers (Fellow-1975, Life Fellow 2007)
- Australian Academy of Technological Sciences and Engineering (Fellow-1980)
- Institution of Engineers, Australia (Honorary Fellow-1985)
- Royal Society, London (Fellow-1989)
- National Academy of Engineering, USA (Foreign Member-2002)
- International Federation of Automatic Control (Fellow – 2005)

PUBLICATIONS

To this date I have published 10 books and approximately 1100 papers. Over the five year period 2013-2017, I published 65 journal articles, 3 book chapters and 64 conference papers. One patent application was granted. My h-index (Google Scholar Citations) is approximately 100..

CURRENT GRANTS (Co-Chief /Principal Investigator)

- Australian Research Council DP 16 (till December 2019) AUD 458000 –Control and Optimization of Distributed Multiagent Formations (With C Yu)
- Data61-CSIRO (part DSTG funded) AUD 453489—Estimation over Networked and Distributed Systems (with G Mao)

TEN CAREER BEST PUBLICATIONS

Anderson, B.D.O., **A System Theory Criterion for Positive Real Matrices**, SIAM J. of Control, Vol 5, No. 2, May 1967, pp 171-182 [Proved a famous claim by Kalman characterizing positive real matrices using state variable descriptions. The result has applications to stability, optimal control. Over 350 cites (Google Scholar Citations).]

Anderson, B.D.O. & Vongpanitlerd, S., **Network Analysis and Synthesis-A Modern Systems Theory Approach**, Prentice Hall, New Jersey, 1973 and Dover Publications, New York, 2006. [Graduate text cum research monograph including much original material on passive network synthesis using Kalman-Yakubovic lemma and related ideas. Later applied to adaptive control by many workers. Over 1100 cites.]

Anderson, B.D.O. & Moore, J.B., **Optimal Filtering**, Prentice Hall Inc., Englewood Cliffs, New Jersey, 1979 and Dover Publications, New York 2005 [Graduate text cum research monograph including much original material, especially on smoothing, spectral factorization, and data saturation. Very widely cited in engineering and economics. Over 7300 cites, multiple translations.]

Bitmead, R.R. & Anderson, B.D.O., **Asymptotically Fast Solution of Toeplitz and Related Systems of Linear Equations**, Linear Algebra & Its Applications, Vol 34, 1980, pp 103-116 [First publication of algorithm (essentially simultaneous with two different methods) for inverting a positive definite $n \times n$ Toeplitz matrix, such as arise in signal processing, in $O(n \log^2 n)$ operations. Over 300 cites.]

Anderson, B.D.O. & Liu Y., **Controller Reduction: Concepts and Approaches**, IEEE Trans. on Automatic Control, Vol 34, No8, August 1989, pp 802-812 [Comprehensive account of controller simplification methodology, including many methods of authors. Applied to Boeing aircraft, later commercial software by Anderson and book by Obinata and Anderson. Over 400 cites.]

Anderson, B.D.O., Deistler, M., Farina, L. & Benvenuti, L. **Nonnegative realization of a linear system with nonnegative impulse response**, IEEE Transactions on Circuits & Systems, Vol 43, No 2, February 1996, pp 134–142. [Solution of problem of existence and construction of a realization with nonnegative state-variable matrices given nonnegative impulse response. Later important Anderson extension to Hidden Markov Model realization. Over 100 cites.]

Lin, J, Morse, A.S. , Anderson, B.D.O. , **The multiagent rendezvous problem**, Proc 42nd IEEE Conference on Decision and Control, December 2003, pp. 1508-1513. [Solved the spatial rendezvous problem, a particular nonlinear consensus problem, (agents have finite sensing radius). Over 300 cites, plus over 220 cites for two journal papers which contained proofs.]

Aspnes, J., Eren, T., Goldenberg, D., Morse, A., Whiteley, W., Yang, Y., Anderson, B.D.O., and Belhumeur, P., **A theory of network localization**, IEEE Transactions on Mobile Computing, vol. 5, No. 12, December 2006, pp. 1663-1678. [Presented major result characterizing, using graph theory, those sensor networks which are localizable, and examined random networks also. Initiated much later work by Anderson and others. Over 365 cites.]

Yu, C., Hendrickx, J.M., Fidan, B., Anderson, B.D.O., Blondel, V.D., **Three and Higher Dimensional Autonomous Formations: Rigidity, Persistence and Structural Persistence**, Automatica, vol. 43, no. 3 March 2007, pp. 387-402 [Established a replacement for the concept of formation rigidity for the control of shapes of three-dimensional formations of agents, given an underlying directed graph topology. Over 110 cites.]

Yu, C., Anderson, B.D.O., Dasgupta, S., Fidan, B., **Control of Minimally Persistent Formations in the Plane**, SIAM J on Control and Optimization, Volume 48, No.1, pp. 206-233, 2009. [Provided for the first time a formation shape control law for a wide class of formations based on unidirectional control of distances. Over 100 cites.]