

## CURRICULUM VITAE

**FULL NAME:** John Alan RICHARDS

**DATE OF BIRTH:** 5<sup>th</sup> October, 1945

**NATIONALITY:** Australian

**CURRENT POSITIONS:** Master of University House and Graduate House  
The Australian National University  
Canberra ACT 0200  
AUSTRALIA

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**QUALIFICATIONS:** BE (Hons 1) Electrical Engineering UNSW 1968  
PhD Electrical Engineering UNSW 1972  
Graduate of the 1995 Defence Industry Study Course

**MEMBERSHIPS:** *Fellow* The Australian Academy of Technological Sciences and Engineering  
*Life Fellow* The Institute of Electrical and Electronics Engineers, Inc. New York  
*Fellow* The Institution of Engineers, Australia

**HONOURS AND PRIZES:** Member of the Order of Australia 2009  
University Award for Outstanding Service to the Campus Community, ANU 2007  
Centenary of Federation Medal 2001  
Most Significant Paper Award (with T. Lee) 3rd Australasian Conference on Remote Sensing 1984  
Commonwealth Postgraduate Research Award 1968 -1971  
IEEE Region 10 Student Prize, First Place 1968  
IEEE International Student Prize, First Place 1968  
Amalgamated Wireless A/Asia Ltd Cadetship 1963-1967  
English Electric Prize for Thesis and Seminar 1967

**RECOGNITION:** Emeritus Professor of the Australian National University  
Emeritus Professor of the University of New South Wales  
Visiting Professor, Harbin Institute of Technology, China

**CAREER SUMMARY:**

Jun 2009 – Jan 2010	Chief Executive Officer, Australian College of Educators (concurrently with ANU appointment)
Jul, Aug 2008	Visiting Fellow, Wolfson College, Cambridge
Jan 2008 – Mar 2009	Professor of Electrical Engineering, ANU College of Engineering and Computer Science.
Nov 2004 – Dec 2007	Dean and Director, ANU College of Engineering and Computer Science (incorporating Director, Research School of Information Sciences and Engineering and Dean, Faculty of Engineering and Information Technology), the Australian National University.
Oct 2003 – Nov 2004	Director, Research School of Information Sciences and Engineering, the Australian National University.
Oct 2001 - <b>date</b>	Master, University House, the Australian National University. (Interim Master Oct 2001 – Oct 2002), including Graduate House from April 2003.
Oct 1998 – Oct 2003	Deputy Vice-Chancellor, The Australian National University. Retitled Deputy Vice-Chancellor and Vice-President from 2001.
Jul 1996 - Oct 1998	Rector, University College, UNSW, Australian Defence Force Academy.
Dec 1991 - Jul 1996	Deputy Rector, University College, UNSW, Australian Defence Force Academy.
Jun 1987 - Jul 1996	Head, School of Electrical Engineering, University College, UNSW, Australian Defence Force Academy.
Jun 1987 - Oct 1998	Professor of Electrical Engineering, University College, UNSW, Australian Defence Force Academy.
Aug 1985 - Jan 1986	Visiting Professor, Department of Geography and Computer Systems Laboratory, University of California, Santa Barbara. (Study leave post.)
Jan 1985 - May 1987	Associate Professor in Electrical Engineering at the University of New South Wales.
Oct 1981 - May 1987	Foundation Director of the Centre for Remote Sensing at the University of New South Wales. (Concurrent appointment with position in Electrical Engineering.)
Aug 1979 - Feb 1980	Visiting Associate Professor, School of Electrical Engineering and Laboratory for Applications of Remote Sensing, Purdue University, Indiana, USA. (Study leave post.)
Jul 1979 - Dec 1984	Senior Lecturer in Electrical Engineering at the University of New South Wales.
Oct 1977 - Jun 1979	Lecturer in Electrical Engineering at the University of New South Wales.
1972 - Oct 1977	Lecturer in Electrical Engineering at the James Cook University of North Queensland, Townsville.
1970 - 1971	Part-time Lecturer in Electrical Engineering at the University of New South Wales. (Concurrent with final period of doctoral research.)
1968 - 1971	PhD student with the School of Electrical Engineering at the University of New South Wales.
1963 - 1967	Technical Trainee in radio with Amalgamated Wireless A/Asia Ltd.

**EXTERNAL COMMITTEE AND BOARD MEMBERSHIPS:**

2011 – <b>date</b>	Member, ACT Learning Capital Council
2010 – <b>date</b>	Deputy President (from 2012) and Member of Council, St Mark's National Theological Centre, Canberra
2009	Deputy Chair, Steering Committee, National Strategic Plan for Earth Observation from Space, AAS and ATSE
2008 - <b>date</b>	Member of judging panel for Eureka Defence Science Prize
2007	Member of judging panel for ACT Engineering Excellence Awards
2006 – 2007	Member, ACT Skills Commission
2006	Member, Committee for the review of the Department of Electrical and Computer Engineering, the University of Western Australia.
2004 – 2012	ACT Accreditation and Registration Council, Chair from 1 January, 2005
2004 – 2005	Member, National Remote Sensing Technical Reference Group (Geoscience Australia).
2003 – 2006	Member, Professorial Promotions Committee, The University of Adelaide.
2003 - <b>date</b>	Member ACT Awards Panel, General Sir John Monash Foundation, Chair from 2009
2002 - 2006	Associate Editor, <i>IEEE Transactions on Geoscience and Remote Sensing</i>
2002 - 2003	Member, Australian Technology Park Advisory Council
2001 - 2006	Member, Neville Bonner Memorial Scholarship Committee
2001 - 2003	Member of the Board for the Australia Centre, Berlin
2001 - 2002	Member of the Board of APTI Pty Ltd
2000 - 2001	Member, AVCC Subcommittee on Research (SCOR)
2001	Member, AVCC GARMA Working Party
1998 - 2002	Member of Board of ANUTECH Pty Ltd
1997 - 2002	Member of Council, Rio Tinto National Youth Science Forum (representing the Australian Academy of Technological Sciences and Engineering).
1991 - <b>date</b>	Member, Editorial Board, <i>Remote Sensing of Environment</i>
1990 - 1998	Member, Fulbright National Selection Committee, Australian-American Education Foundation.
1995	Member, Engineering and Geosciences Expert Panel, Major National Research Facilities Program, DIST.
1994 - 1995	Convenor, Expert panel to advise on the selection of the recipient(s) of the 1995 Australia Prize.
1993 - 1996	Member and Deputy Chair, Australian Space Council. 1993-94 Chair, Earth Observation Working Party for formulating remote sensing input to the Council's first Five Year Plan. 1995-1996 Member, Remote Sensing Board of Council.
1992 - 1994	Member, URSI Commission F (Wave Propagation and Remote Sensing).
1991 - 1992	Deputy Chair (1992) and member (1991-92), Research Grants Committee of the Australian Research Council.

1991 - 1992	Member of the Planning and Review Committee of the Australian Research Council.
1990 - 1992	Chair (1991-92) and member (1990-92) Board of Studies of the ACT School of Engineering.
1989 - 1992	Member, Priority Panel on Scientific Instruments and Instrumentation, Australian Research Council.
1988 - 1992	Chair (1991-92) and member (1988-92), Discipline Panel on Engineering, Earth and Applied Sciences, Australian Research Council.
1988 - 1991	Member, Remote Sensing Committee, Australian Space Board.
Jul 1987	Chair of the Accreditation Panel for the Graduate Diploma in Remote Sensing, Curtin University.
1987	Member of the Study Group and Chair of the Payload Committee for an Australian Space Board sponsored Phase A contract investigating an Australian Science and Applications Spacecraft.
1986 - 1987	Chair, CSIRO Office of Space Science and Applications Study Group on the International Polar Platform.
1985 - 1988	Member of the Remote Sensing Working Party of the Scientific Industries Steering Committee of the Department of Science (responsible for promoting Australian space technology in the ASEAN countries).
1985 - 1987	Universities' Representative on the Agricultural Remote Sensing Committee. (AVCC appointment.)
1984 - 1990	Universities' Representative on the Australian Liaison Committee on Remote Sensing by Satellite (ALCORSS). This was a government advisory group. (AVCC appointment.)

#### **LEARNED ACADEMY AND PROFESSIONAL SOCIETY ACTIVITIES:**

2011 – <b>date</b>	President, International Society for Digital Earth
2008 – <b>date</b>	Member ACT Divisional Committee, Australian Academy of Technological Sciences and Engineering.
2007 – 2010	Member, IEEE Geoscience and Remote Sensing Fellow Assessment Committee
2005 – 2007	Chair ACT Division and Member of Council, Australian Academy of Technological Sciences and Engineering.
2003 - 2004	Member, International Relations Committee, Australian Academy of Technological Sciences and Engineering.
1999 - 2001	Co-chair, Technical Program Committee, and member of the Organising Committee for IGARSS2001 (IEEE International Geoscience and Remote Sensing Symposium), Sydney 10-14 July, 2001.
1992 - 1996	Member, Institution of Engineers, Australia, National Committee on Space Engineering.
1988 - 1991	Member, Electrical Engineering Panel for course accreditation, The Institution of Engineers, Australia.
1983 - 1986	Chairman of Council, The Institution of Radio & Electronics Engineers, Australia (IREE).
1978 - 1988	Councillor and Vice President (1982 – 1984), IREE.
1978 - 1981	Chairman of the External Activities Board of the IREE.
Oct 1977 - Oct 1978	Member, Publications Board of the IREE.

**MAJOR INTERNAL REVIEWS CHAIRED:**

2007-2008	<i>Staffing Structures Working Party, ANU</i>
Jul 2004	<i>Environment and Sustainability at the ANU: A Future Options, ANU</i>
Oct 1999	<i>Review of The Faculties, ANU.</i>
Jul 1997	<i>UNSW 2000 Working Party on Education Technology, UNSW.</i>
Sep 1995	<i>Information Technology Review, University College, UNSW, Australian Defence Force Academy.</i>

**RESEARCH INTERESTS:**

Remote sensing digital image analysis.  
Radar remote sensing and backscatter modelling.

**TEACHING INTERESTS:**

Remote Sensing, Radar and Navigational Aids, Propagation, Guided Waves, Analog Electronics, Circuits and Systems.

**PRINCIPAL INVESTIGATOR STATUS:**

NASA SIR-B Space Shuttle Imaging Radar Mission  
ESA ERS-1 Imaging Radar Mission  
NASDA JERS-1 Imaging Radar Mission

**REVIEWER FOR:**

IEEE Transactions on Geoscience and Remote Sensing  
Remote Sensing of Environment

**RESEARCH STUDENT SUPERVISION:****PhD**

James Moody, 2004	Innovation Management in Complex Product Systems: Applications to the Space Industry. ANU (Co-supervisor with Professor Mark Dodgson)
Xiuping Jia, 1996	Classification of Hyperspectral Data Sets. UNSW
Yunhan Dong, 1995	A Long Wavelength Radar Backscatter Model for Forests. UNSW
Zia Ahmed, 1992	Radar Backscatter Modelling of Forest Stands Containing Arbitrarily Distributed Woody Structures. UNSW.
Ashwin Srinivasan, 1991	An Artificial Intelligence Approach to the Analysis of Multiple Information Sources in Remote Sensing. UNSW.
Guoqing Sun, 1990	Radar Backscatter Modeling of Coniferous Forest Canopies. University of California, Santa Barbara. (Member of Sun's Advisory Committee.)
Andrew Skidmore, 1989	Extracting Forest Resource Information from Remotely Sensed and Ancillary Data: Use of an Expert System. ANU. (Member of Skidmore's Advisory Committee.)
Keith McCloy, 1989	Development and Evaluation of a Remote Sensing Algorithm Suitable for Mapping Environments Containing Significant Spatial Variability.

University of Adelaide. (External Supervisor appointed by the University of Adelaide for 1986-1988)

- Tong Lee, 1986                      Multisource Context Classification Methods in Remote Sensing. UNSW.
- Kim Dinh, 1981                      Transient Response of Surface Acoustic Wave Propagation to Thermal Perturbation. UNSW. (Co-supervisor with Professor L.W. Davies.)

### **Masters**

- Catherine Rayner, 2003              A History of Remote Sensing in Australia.  
M Phil ANU (Co-supervisor with Dr Sue Stocklmayer)
- Peter Woodgate, 1991                The Development of Methodologies for the Mapping of Wild-Fire Damage in Eucalypt Forests Using Landsat Imagery.  
MAppSc Thesis, UNSW
- Michael Ryan, 1989                  Shape Detection in Multispectral Imagery.  
MEngSc Thesis, University College, UNSW
- Ross Musumeci, 1986                Determination, Generation and Measurement of Operating Parameter Tolerances of a Fourfold Monopole Mass Spectrometer, Operated in an Isotope Ratio Measuring Mode, Using Surface Acoustic Wave Techniques.  
MEngSc Thesis, James Cook University of North Queensland.
- Alan Mauger, 1985                    The Use of Label Relaxation in Vegetation Mapping of the Kosciusko National Park.  
MAppSc Thesis, UNSW.  
(Co-supervisor with Assoc. Prof. A.K. Milne.)
- Ian Goodwin, 1984                    A Methodology for the Application of Digitised Small Format Colour Infrared Aerial Photography to Vegetation Mapping.  
MAppSc Thesis, UNSW.  
(Co-supervisor with Assoc. Prof. A.K. Milne.)
- David Altman, 1984                    A Graphics System for the Dipix Image Analysis System.  
MEngSc Thesis, UNSW
- David Kelly, 1982                    The Concept of Spectral Class - A Comparison of Clustering Algorithms.  
MEngSc Thesis, UNSW.
- Anthony Griffiths, 1977                An Investigation of the Interpretation and Coding of Mass Spectra using Computerised Learning Machines.  
MEngSc Thesis, James Cook University of North Queensland.
- Denis Lonergan, 1973                The Effect of a Passive Reflector Behind a VHF Log-Periodic Dipole Antenna.  
MEngSc Thesis, James Cook University of North Queensland.

**PUBLICATIONS:****Books:**

1. J.A. Richards, *Analysis of Periodically Time-Varying Systems*, Springer-Verlag, Berlin, 1983.
2. J.A. Richards, *Remote Sensing Digital Image Analysis*. Springer-Verlag, Berlin, 1986.  
 Second Edition, 1993.  
 Student Edition, 1994.  
 Third Edition, 1999 with X. Jia as co-author.  
 Fourth Edition, 2006 with X. Jia as co-author (translated into Chinese 2008).  
 Fifth Edition (complete rewrite) to appear 2012.
3. J.A. Richards, *Radio Wave Propagation: An Introduction for the Non-Specialist*, Springer-Verlag, Berlin, 2008
4. J.A. Richards, *Remote Sensing with Imaging Radar*, Springer-Verlag, Berlin, 2009

**Book Chapters:**

1. J.A. Richards, Statistical and neural methods for thematic mapping. In E. Binaghi, P.A. Brivio and S.B. Serpico (eds), *Geospatial Pattern Recognition*, Research Signpost, Kerala, India, 2002, ISBN 81-7736-132-5.
2. J.A. Richards, Remote sensing sensors: Capabilities and information processing requirements. In C.H. Chen (ed), *Frontiers of Remote Sensing Information Processing*, World Scientific, Singapore, 2003.
3. X. Jia and J.A. Richards, Hyperspectral Data Representation, in Chien-I Change (ed), *Advanced Topics in Hyperspectral Data Exploitation*, Wiley, NJ, 2007.

**Guest Editorships of Special Issues:**

1. Special Issue on Images, *Proceedings of the Institution of Radio and Electronics Engineers, Australia*, incorporated in *J.EEE Aust*, 1, 1981.
2. Special Issue of the *IEEE Transactions on Geoscience and Remote Sensing*, Vol 40, Number 10, October 2002, covering refereed papers from the International Geoscience and Remote Sensing Symposium, 2001, Sydney. Guest Associate Editor with Dr Megan Lewis of the University of Adelaide.
3. Special Issue of the *IEEE Transactions on Geoscience and Remote Sensing*, covering refereed papers from the Workshop on Advances in Techniques for Analysis of Remotely Sensed Data. NASA Goddard Space Flight Center, Maryland, 27-28 Oct., 2003. March 2005. Guest associate editor with 4 others.

**Papers in Refereed Journals:**

1. C.M. Groden & J.A. Richards, On the non-uniformly illuminated p<sup>+</sup>-n junction. I. Linearised, time-dependent case. *Solid State Electronics*, 11, pp. 997-1004, 1968.
2. C.M. Groden & J.A. Richards, On the non-uniformly illuminated p<sup>+</sup>-n junction. II. Non-linear, time-independent case. *Solid State Electronics*, 12, pp. 813-821, 1969.
3. J.A. Richards, R.M. Huey & J. Hiller, On the time varying potential in the quadrupole mass spectrometer. *Proc. IREE (Aust)*, 32, pp. 321-322, 1971.
4. J.A. Richards, R.M. Huey & J. Hiller, A fourfold monopole mass spectrometer. *Int. J. Mass Spectrom. Ion Phys.*, 10, pp. 486-488, 1972/73.

5. J.A. Richards & D.J. Miller, Features of mode diagrams for  $k^{\text{th}}$  order periodic systems. *SIAM J. Appl. Math.*, 25, pp. 72-82, 1973.
6. J.A. Richards, R.M. Huey & J. Hiller, A new operating mode for the quadrupole mass filter. *Int. J. Mass. Spectrom. Ion Phys.*, 12, pp. 317-339, 1973.
7. J.A. Richards, R.M. Huey & J. Hiller, The truncated Hill determinant as a tool in quadrupole mass filter studies. *Int. J. Mass Spectrom. Ion Phys.* 13, pp. 443-451, 1974.
8. J.A. Richards, R.M. Huey & J. Hiller, Conditions for selectivity in a quadrupole mass filter. *Int. J. Mass Spectrom. Ion Phys.*, 15, pp. 379-390, 1974.
9. J.A. Richards, R.M. Huey & J. Hiller, Waveform parameter tolerances for the quadrupole mass filter with rectangular excitation. *Int. J. Mass Spectrom. Ion Phys.*, 15, pp. 417-428, 1974.
10. J.A. Richards, & R.N. McLellan, Fast computer simulation of a quadrupole mass filter driven by a sinusoidal R.F. waveform. *Int. J. Mass Spectrom. Ion Phys.*, 17, pp. 17-22, 1975.
11. J.A. Richards, Conditions for selectivity in a quadrupole mass filter: addendum. *Int. J. Mass. Spectrom. Ion Phys.*, 17, pp. 213-214, 1975.
12. J.A. Richards, On the choice of steps in the piecewise-constant Hill equation model of a quadrupole mass filter. *Int. J. Mass Spectrom. Ion Phys.*, 18, pp. 11-19, 1975.
13. J.A. Richards, Stability diagram approximation for the lossy Mathieu equation. *SIAM J. Appl. Math.*, 30, pp. 240-247, 1976.
14. J.A. Richards, Quadrupole mass filter spectrum control using pulse width modulation. *Int. J. Mass Spectrom. Ion Phys.*, 24, pp. 219-224, 1977.
15. J.A. Richards & P.G. Cristaudo, Parametric aspects of mode and stability diagrams for general periodic systems. *IEEE Transactions on Circuits & Systems*, CAS-24, pp. 241-247, 1977.
16. C.P. Anese & J.A. Richards, Low capacity codes for mass spectra based on statistical moments, *Analytical Chemistry*, 49, pp. 1456-1458, 1977.
17. R.A. Musumeci & J.A. Richards, Modelling of a monopole mass spectrometer with a view to determining operating parameter tolerances. *J. Vac. Sci. Tech.*, 14, pp. 1180-1185, 1977.
18. J.A. Richards, Modelling parametric processes - a tutorial review. *Proc. IEEE*, 65, pp. 1549-1557, 1977.
19. J.A. Richards & R.M. Huey, Performance and application of a fourfold monopole mass spectrometer. *Int. J. Mass Spectrom. Ion Phys.*, 27, pp. 349-357, 1978.
20. P.W. Cook & J.A. Richards, Correlation techniques in power line carrier protection signalling. *I.E. Aust. Trans. College Elect. Eng.*, 15 pp. 12-16, 1979.
21. J.A. Richards & A.G. Griffiths, On confidence in the results of learning machines trained on mass spectra. *Analytical Chemistry*, 51, pp. 1358-1361, 1979.
22. J.L. Winters, R.A. Musumeci & J.A. Richards, Optimum analysing electrode radius in a fourfold monopole mass spectrometer. *Int. J. Mass Spectrom. Ion Phys.*, 31, pp. 31-36, 1979.
23. J.A. Richards, D.A. Landgrebe & P.H. Swain, Pixel labelling by supervised probabilistic relaxation. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, PAMI-3, pp. 188-191, 1981.
24. J.A. Richards, D.A. Landgrebe & P.H. Swain, On the accuracy of pixel relaxation labelling. *IEEE Transactions on Systems, Man & Cybernetics*, SMC-11, pp. 303-309, 1981.
25. J.A. Richards, D.A. Landgrebe & P.H. Swain, A means of utilizing ancillary information in multispectral classification. *Remote Sensing of Environment*, 12, pp. 463-477, 1982.
26. J.A. Richards, Thematic mapping from multitemporal image data using the principal components transformation. *Remote Sensing of Environment*, 16, pp. 35-46, 1984.
27. T. Lee & J.A. Richards, Piecewise linear classification using seniority logic committee methods, with application to remote sensing. *Pattern Recognition*, 17, pp. 453-464, 1984.
28. G.E. Moreton & J.A. Richards, Irrigated crop inventory by classification of satellite image data. *Photogrammetric Eng. & Remote. Sensing*, 50, pp. 729-730, 1984.

29. J.A. Richards & D.J. Kelly, On the concept of spectral class. *Remote Sensing Letters*, 5, pp. 987-991, 1984.
30. T. Lee & J.A. Richards, A low cost classifier for multitemporal applications. *Int. J. Remote Sensing*, 6, pp. 1405-1417, 1986. (Invited).
31. T. Lee, J.A. Richards & P.H. Swain, Probabilistic and evidential approaches for multisource data analysis. *IEEE Transactions on Geoscience & Remote Sensing*, GE-25, pp. 283-293, 1987.
32. J.A. Richards, G-Q Sun & D.S. Simonett, L-band radar backscatter modelling of forest stands. *IEEE Transactions on Geoscience & Remote Sensing*, GE-25, 4, pp. 487-498, 1987.
33. J.A. Richards, P.W. Woodgate & A.K. Skidmore, An explanation of enhanced radar backscattering from flooded forests. *International Journal of Remote Sensing*, 8, pp. 1093-1100, 1987.
34. Z. Ahmed & J.A. Richards, Multiple incidence angle SIR-B forest observations. *IEEE Transactions on Geoscience and Remote Sensing*, GE-27, pp. 586-591, 1989.
35. A. Srinivasan & J.A. Richards, Knowledge-based techniques for multi-source classification. *International Journal of Remote Sensing*, 11, pp. 505-525, 1990.
36. J. Way, ... J.A. Richards, et al, The effect of changing environmental conditions on microwave signatures of forest ecosystems: preliminary results of the March 1988 Alaskan aircraft SAR experiment. *International Journal of Remote Sensing*, 11, pp. 1119-1144, 1990.
37. J.A. Richards, Radar backscatter modelling of forests: a review of current trends. *International Journal of Remote Sensing*, 11, pp. 1299-1312, 1990.
38. X. Jia & J.A. Richards, Binary coding of imaging spectrometry data for fast spectral matching and classification. *Remote Sensing of Environment*, 43, pp. 47-53, 1993.
39. A. Srinivasan & J.A. Richards, Analysis of GIS spatial data using knowledge-based methods. *International Journal of Geographic Information Systems*, 7, pp. 479-500, 1993.
40. X. Jia & J.A. Richards, Efficient maximum likelihood classification for imaging spectrometer data sets. *IEEE Transactions on Geoscience and Remote Sensing*, 32, pp. 274-281, 1994.
41. Y. Dong & J.A. Richards, Studies of the cylinder-ground double bounce scattering mechanism in forest backscatter models. *IEEE Transactions on Geoscience and Remote Sensing*, 33, pp. 229-231, 1995.
42. Y. Dong, J.A. Richards & J.D. Cashman, A model of volume attenuation and backscattering by foliage at L- and P-bands. *Int. J. Remote Sensing*, 16, pp.1231-1247, 1995.
43. J.A. Richards, Classifier performance and map accuracy, *Remote Sensing of Environment*, 57, pp.161-166, 1996.
44. X. Jia & J.A. Richards, Progressive two class decision classifier for optimization of class discriminations, *Remote Sensing of Environment*, 63, pp.289-297, 1998.
45. X. Jia & J.A. Richards, Segmented principal components transformation for efficient hyperspectral remote sensing image display and classification. *IEEE Transactions on Geoscience and Remote Sensing*, 37, 538-542, 1999.
46. X. Jia and J.A. Richards, Cluster space representation for hyperspectral classification. *IEEE Transactions on Geoscience and Remote Sensing*, 40, 593-598, 2002.
47. X. Jia and J.A. Richards, Efficient transmission and classification of hyperspectral image data. *IEEE Transactions on Geoscience and Remote Sensing*, 41, 1129-1132, 2003.
48. J.A. Richards, Analysis of Remotely Sensed Data: the Formative Decades and the Future. *IEEE Transactions on Geoscience and Remote Sensing*, 43, March 2005, pp. 422-432.
49. X. Jia and J.A. Richards, Fast k-NN classification using the cluster space approach. *Geoscience and Remote Sensing Letters*, 2, April 2005, pp. 225-228.
50. J.A. Richards and X. Jia, A Dempster-Shafer approach to context classification. *IEEE Transactions on Geoscience and Remote Sensing*, 45, May, 2007, pp. 1422-1431.

51. X. Jia and J.A. Richards, Managing the Spectral-Spatial Mix in Context Classification Using Markov Random Fields, *Geoscience and Remote Sensing Letters*, 5, April 2008, pp. 311-314.
52. J.A Richards and X. Jia, Using Suitable Neighbours to Augment the Training Set in Hyperspectral Maximum Likelihood Classification. *Geoscience and Remote Sensing Letters*, 5, October 2008, pp. 774-777.

#### Conference Papers:

1. J.A. Richards, An integral transform modelling approach to the problems of high temperature and plasma chemical kinetics. *8th AINSE Plasma Physics Conference*, Sydney, February 1971.
2. J.A. Richards, An integral transform modelling approach to the problems of high temperature chemical kinetics. *1st Conf. of the Aust. and New Zealand Soc. for Mass Spectrom.*, Sydney, August 1971.
3. J.A. Richards, A new operating mode for quadrupole mass filters. *1st Conf. of the Aust. & New Zealand Soc. for Mass Spectrom.*, Sydney, August 1971.
4. J.A. Richards, Modelling philosophy for a quadrupole mass filter. *2nd Conf. of the Aust. & New Zealand Soc. for Mass Spectrom.*, Melbourne, February 1973.
5. J.A. Richards & P.G. Cristaudo, Degenerate parametric effects in high order periodic circuits, *Int'l Electronics Convention '75 - 15th National Convention of the IREE Aust.*, Sydney, Aug. 1975, pp. 45-48.
6. J.A. Richards & R.M. Huey, influence of harmonics of the R.F. wave-form in a quadrupole mass filter. *3rd Conf of the Aust. & New Zealand Soc. for Mass Spectrom.*, Canberra, January 1975.
7. J.A. Richards, & R.N. McLellan, Fast computer simulation of a quadrupole mass filter. *3rd Conf. of the Aust. & New Zealand Soc. for Mass Spectrom.*, Canberra, January 1975.
8. J.A. Richards, Miniature mass spectrometer for the simultaneous measurement of four constituents. *10th AINSE Plasma Physics Conf.*, Sydney, February 1975.
9. J.R. Wicking & J.A. Richards, Mass spectrometer peak height ratio studies using a microprocessor. *IE Aust. Colloquium on Microprocessor Applications*, Sydney, November 1976.
10. J.A. Coekin & J.A. Richards, The management of measurement: 1976-2001, *IE Aust Annual Engineering Conf. 1976*, Townsville, May 1976. pp. 171-175.
11. J.A. Richards & R.M. Huey, Use of a fourfold monopole mass spectrometer for precise isotope ratio measurements, *7th Int'l Mass Spectrom. Conf.*, Florence, Italy Aug - Sept 1976. Published in Vol. 7 of the *Proceedings of the 7th Int'l Conf. on Mass Spectrometry*.
12. J.A. Richards, Exploiting an explosion (education for efficient use of modern instrumentation), *IMEKO TC-1 International Colloquium - The Nature and Scope of Measurement Science*, Armidale, NSW, November 1976.
13. P.G. Cristaudo & J.A. Richards, Considerations in the design of a two channel parametric amplifier, *IREECON Int'l 16th National Convention of the IREE Aust.*, Aug. 1977, pp. 423-425.
14. J.A. Richards & R.M. Huey, Performance and application of fourfold monopole mass spectrometer. *4th Biennial Conf. of the Aust. & New Zealand Soc. for Mass Spectrom.*, Wellington, N.Z. January 1977.
15. J.A. Richards & R.A. Musumeci, Conditions for high performance operation of a monopole mass spectrometer. *4th Biennial Conf. of the Aust. & New Zealand Soc. for Mass Spectrom.* Wellington, N.Z., January 1977.
16. J.A. Richards & R.M. Huey, Precise peak height ratio measurement with a fourfold monopole mass spectrometer. *11th AINSE Plasma Physics Conference*, Sydney, February 1977.
17. J.A. Richards & R.A. Musumeci, Experimental evaluation of the stability of the fourfold monopole mass spectrometer for precise isotope ratio measurements. *5th Conf. of the Aust. & New Zealand Soc. for Mass Spectrom.*, Brisbane, August-September 1978.

18. J.A. Richards, A.G. Griffiths, & C.P. Anese, Mass spectral moment codes in automatic recognition and library searching. *5th Conf. of the Aust. & New Zealand Soc. for Mass Spectrom.*, Brisbane, August-September 1978.
19. P.W. Cook & J.A. Richards, Correlation techniques in power line carrier protection signalling, *Electrical Energy Conference 1978*, Canberra May 11-12, pp. 104-108.
20. P.W. Cook & J.A. Richards, Correlation detection in power line carrier protection signalling, *Canadian Conference on Communications and Power*, Montreal, October 1978, pp. 438-441.
21. J.A. Richards & R.S. Byers, Prospects for majority vote classifiers in LANDSAT feature analysis, *Proc. LANDSAT 79 - the First Australian Landsat Conference*, Macquarie University, Sydney, May 1979. pp. 517-529.
22. J.A. Richards, D.A. Landgrebe & P.H. Swain, Overcoming accuracy deterioration in pixel relaxation labelling, *Proc. 5th Int'l Conf. Pattern Recognition*, Florida, Dec. 1980. pp. 61-65.
23. J.A. Richards, D.A. Landgrebe & P.H. Swain, Quantitative use of ancillary data in pixel relaxation labelling. *6th Purdue Symposium on Machine Process, Remote Sensed Date*, West Lafayette, Indiana, June 1980.
24. J.A. Richards & A. Maheswaran, Relaxation labelling methods in image analysis. *Australian Symposium on Stereology & Image Analysis*, Sydney, September 1981.
25. G.E. Moreton & J.A. Richards, Irrigated crop inventory by simple classification, *Proc. 2nd Aust. Remote Sensing Conference*, Canberra, Sept. 1981. pp. 2.16.1 - 2.16.4.
26. J.A. Richards, D.A. Landgrebe & P.H. Swain, Review of pixel relaxation labelling techniques in remote sensing, *Proc. 2nd Aust. Remote Sensing Conference*, Canberra, Sept. 1981. pp. 6.9.1. - 6.9.4.
27. R.S. Byers & J.A. Richards, A piecewise linear classifier for remote sensing applications, *Proc. 2nd Aust. Remote Sensing Conference*, Canberra, Sept. 1981. pp. 6.2.1. - 6.2.5.
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