

Biography:

Tshilidzi Marwala is the Dean of the Faculty of Engineering and the Built Environment at the University of Johannesburg. In this capacity he introduced the School System and merged departments. He was a full Professor of Electrical Engineering, the Carl and Emily Fuchs Chair of Systems and Control Engineering, and the DST/NRF South Africa Research Chair of Systems Engineering all at the University of the Witwatersrand. He has received more than 40 awards including being the youngest recipient of the Order of Mapungubwe (other recipients include Nobel Prize Winners Sydney Brenner, Allan Cormack, JM Coetzee, FW de Klerk and Nelson Mandela) and was awarded the President Award by the National Research Foundation of South Africa. He holds a Bachelor of Science in Mechanical Engineering (Magna Cum Laude) from Case Western Reserve University, a Master of Engineering from the University of Pretoria and a Ph.D. in Computational Intelligence from the University of Cambridge. He was a post-doctoral research associate at the Imperial College (London) working on intelligent software. His research interests include the application of computational intelligence to engineering, computer science, finance, social science and medicine. Marwala has made fundamental contributions to engineering including the development of the concept of pseudo-modal energy and the development of Bayesian framework for solving engineering problems. He has supervised to completion 35 Master's and 5 PhD students and has published over 200 papers. Most of his former students have proceeded with their careers at institutions such as Harvard, Purdue, Rutgers, Cambridge and Oxford Universities. He has served on many boards of directors including the information technology companies EOH (Pty), the Johannesburg Centre for Software Engineering and State Information Technology Agency (Pty) Ltd. In addition, he has edited 1 book, has authored 3 books on computational intelligence and holds 3 international patents. He is a Senior Member of both the ACM and the IEEE as well as a Fellow of the following institutes: African Scientific Institute, Royal Statistical Society, Academy of Science of South Africa, South African Academy of Engineering, Royal Society for the Encouragement of Arts, Manufactures and Commerce, Council for Scientific and Industrial Research and is a Registered Professional Engineer. He has been an associate editor of 6 journals including the International Journal of Systems Science and has acted as a reviewer for more than 26 international journals. He has been an invited speaker and delegate in more than 18 international conferences and summits and has been a chairman of a committee of 8 experts that developed a strategy on how to unbundle the fixed line telecommunication company Telkom (listed then at the New York Stock Exchange at the time). He co-invented and patented a computational method for radiation imaging and co-invented and patented coded apertures masks that are used in computer based radiation-based medical imaging. He also co-invented and patented the artificial larynx that uses neural networks and this was a subject of the MIT Technology Review. He developed the neuro-rough model and Bayesian based genetic programming method and applied these to modelling complex systems such as HIV, Interstate conflict and biomedical processes. He published the first book on the use of computational intelligence for decision making with missing data and has authored the first book on the use of computational intelligence for finite element updating. He developed computational tools for modelling and controlling the brewing process and developed the computer based artificial beer taster that maps the chemical composition of beer to the beer taste score that is usually obtained from a panel of professional tasters. He has been a significant driver of Computational Intelligence research in Africa and for that he was awarded the TWAS-AAS-Microsoft 2009 Award for Young Scientists.

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CITIZENSHIP: Republic of South Africa

PROFESSIONAL EXPERIENCE

- Dean of Engineering and the Built Environment, University of Johannesburg (01/01/2009)
- DST/NRF SARChI Chair of Systems Engineering, University of the Witwatersrand (01/01/2007-01/01/2008)
- Carl and Emily Carl Fuchs Chair of Control and Systems Engineering, University of the Witwatersrand (01/03/2006-01/01/2008)
- Personal Professor of Electrical and Information Engineering, University of the Witwatersrand (01/12/2005-31/12/2008)
- Associate Professor of Electrical and Information Engineering, University of the Witwatersrand (04/01/2003-11/30/2005)
- Head of Control and System Group: Department of Electrical and Information Engineering, University of the Witwatersrand (04/01/2003-31/12/2008)
- Executive Assistant: Technical Director: SABMiller (01/09/2001-30/03/2003)
- Post-Doctoral Research Associate: Imperial College of Science, Technology and Medicine (London) (01/05/2000-30/08/2001)
- Project Engineer: Council for Scientific and Industrial Research – Mining Technology Division (01/06/1995-31/12/1995)

CAREER HIGHLIGHTS:

- Merged the Departments of Power and Control Engineering with the Department of Electronic and Computer Engineering Technology to form Department of Electrical Engineering Technology at the University of Johannesburg
- Introduced the Faculty of Engineering and the Built Environment Industrial Advisory Board at the University of Johannesburg
- Introduced the Performance Management System for all Heads of Departments and Vice-Deans at the University of Johannesburg
- Introduced the School of Electrical Engineering, School of Civil Engineering and the Built Environment, School of Mechanical and Industrial Engineering, and School of Mines, Metallurgy and Chemical Engineering at the University of Johannesburg
- Leader of a team of 8 experts that developed a strategy on how to unbundle the fixed line telecommunication company Telkom (Listed in the New York Stock Exchange at the time)
- Leader of a delegation that met various stakeholders including the Telecommunication Regulator (ICASSA) and the executive team of Telkom.
- Participated in the Presidential International Advisory Council on Information Technology (PIAC). Delegates included global CEOs of HP and Alcatel.
- Communicated widely in print, radio and national television.
- Worked closely with the Minister of Communications of South Africa.

- Leader of a delegation that negotiated the exit of the Chief Executive Officer of City Power Johannesburg
- Leader of a delegation that negotiated with the Municipal Workers Union of South Africa on matters pertaining wages at City Power Johannesburg
- Leader of a delegation to the South African Parliament Portfolio Committee on Science and technology to present the annual business plan.
- Chairman of the Oversight Committee of City Power Johannesburg
- Member of the Procurement Committee of City Power Johannesburg
- Member of the Pricing and Regulation Committee of City Power Johannesburg
- Chair of the Finance Committee of the Limpopo Business Support Agency
- Member of the strategic committee of Statistics South Africa
- Developed the following techniques: neuro-rough model, pseudo-modal energy and Bayesian based genetic programming
- Published the first book on the use of computational intelligence for missing data estimation
- Published the first book on the use of computational intelligence for finite element updating
- Authored 3 books, 200 papers in refereed international journals, proceedings and book chapters and registered 3 patents.
- Supervised 5 PhD's and 35 master's theses to completion. Some of these graduates have proceeded to universities such as Harvard, Oxford, Cambridge and Purdue to further their research careers.
- Hosted 5 visiting professors from Japan, USA, India, Poland and United Kingdom at the University of the Witwatersrand in South Africa
- Involved in many leadership activities at international conferences, the South African parliament and industrial organizations.
- Raised approximately US\$1.8 million worth of grant funding.
- Chaired sessions in more than 10 international conferences held in countries such as the USA, Botswana, Japan, China.
- Elected Visiting Fellow at Harvard University and Wolfson College at the University of Cambridge as well as Visiting Scholar at University of California (Berkeley)
- Lectured the following courses at both the undergraduate and graduate levels at the University of the Witwatersrand: Control and Systems, Information Engineering Techniques, Electrical Engineering Design, Optimization and Artificial Intelligence.
- Consulted for the following companies: Grintek on Information Security, Council for Scientific and Industrial Research on multi-agent systems, Kentron for medical imaging and ESKOM for fault detection in the electrical cable transmission lines.
- Developed computational tools for modelling and controlling the brewing process at SABMiller.
- Developed the artificial beer taster that maps the chemical composition of beer and the beer taste score that is usually obtained from a panel of professional tasters at SABMiller.
- Developed automated processes for predicting faults in the assembly line at SABMiller.
- Treasurer of the Cambridge United Nations Society
- Secretary of the Cambridge Southern African Society
- President of the Pretoria branch of the American Society of Mechanical Engineering
- Developed strategies to promote safety in the mines at CSIR Mining Technology Division
- Identified and assessed deserving candidate and the approved funding for PhD studies at St. John's College, University of Cambridge for the Bradlow Foundation.

- Identified and approved funding for many community based organizations for the Carl and Emily Fuchs Foundations

EDUCATION

- PLD¹ (2006-2007), Harvard Business School, Cambridge.
- Ph.D. Engineering (1997-2000), University of Cambridge, United Kingdom
- M.Eng. Mechanical Engineering (1996-1997), University of Pretoria, South Africa
- B.Sc. Mechanical Engineering, *Magna Cum Laude*, (1991-1995), Case Western Reserve University - Ohio, United States of America

MEMBER OF BOARD OF DIRECTORS/TRUSTEES

- Deputy Chairman: Limpopo Business Support Agency (01/01/2006-Present)
- Board Member: EOH (Pty) Ltd. (01/01/2008-Present)
- Board Member: Johannesburg Centre for Software Engineering (01/01/2008-Present)
- Board Member: City Power Johannesburg (Pty) Ltd. (01/01/2005-Present)
- Board Member: South African Statistics Council (01/03/2005-31/07/2008)
- Board Member: National Advisory Council on Innovation (01/04/2005-present)
- Trustee: The Bradlow Foundation (01/07/2006-present)
- Trustee: Carl and Emily Fuchs Foundation (01/03/2006-present)
- Board Member: South African National Council of Scientific Professions (01/03/2006-31/02/2007)
- Executive Committee Member: South African Academy of Engineering (07/2008-Present)

SELECTED AWARDS, HONOURS AND ACHIEVEMENTS

- Paper Co-Authored was Featured in the MIT Technology Review (2009)²
- TWAS-AAS-Microsoft 2009 Award for Young Scientists
- Visiting Scholar The Center for Studies in Higher Education University of California at Berkeley (November 2009)³
- Best Paper Award: Proceedings of the 12th World Multi-Conference on Systemics, Cybernetics and Informatics, 2008, June 29th –July 2nd, Orlando, Florida, USA.
- 2008 SAIEE Premium Best Paper Award.
- Visiting Fellow Wolfson College, University of Cambridge (2007-2008)
- National Science and Technology Forum (NSTF) Award: Individual through research and its outputs (over the last five years or less) (2007)
- Visiting Fellow Harvard University (2006-2007)
- Bronze Order of Mapungubwe – President of South Africa (2004)
- Invited Talk: Asia-Pacific Workshop on Structural Health Monitoring, Yokohama, Japan (2006)
- Best Presentation Award: World Congress of Computational Intelligence (2006)

¹ Programme for Leadership Development

² <http://www.technologyreview.com/biomedicine/24051/>

³ The position not taken due to busy schedule

- Council of City of Johannesburg: Motion of Congratulations for Contribution to Science Adopted (2004)
- WhosWho in Southern Africa (2005)
- National Research Foundation President's Award (P-Rating) (2003)
- Mail and Guardian: 100 Future Leaders in (2005)
- The Star Newspaper: Top 100 of 2004
- Mail and Guardian: 20 Future Leaders (2005)
- Tuksalumni Laureate Award (2004)
- Marquis Who'sWho in the World (2004, 2005, 2006)
- WhosWho in Computational Science and Engineering (2005)
- Dr. T.W. Kambule Research Award (2004)
- CSIR Fellowship (2004)
- Friedel Sellschop Award (2004)
- South African Broadcasting Corporation (SABC2) - Tribute Achievers Award (Winner: Science and Technology) (2003)
- Extraordinary Professor - University of Pretoria (2003)
- Represented Business South Africa - United Nations World Summit on Sustainable Development (2002)
- Extraordinary Lecturer - University of Pretoria (2002)
- Best Paper Award - International Symposia on Soft Computing and Intelligent Systems for Industry (2002)
- Charles Hesterman Merz Fund Award (2000)
- Paper Awarded a Bronze Medal-South African Institution of Mechanical Engineers (1999)
- Ford of Britain Trust Award (1999)
- Fellow of the Cambridge Philosophical Society (1998)
- Fellow of the Cambridge Commonwealth Trust (1997)
- Honorary Cambridge Malaysian Scholar (1997)
- Honorary Cambridge Mandela Scholar (1997)
- Bradlow Foundation Scholarship (1997-2000)
- Overseas Research Award (1997-2000)
- Foundation for Research and Development Prestige/Equity Scholarship (1996-1997)
- AECI Post-graduate Fellowship (1996-2000)
- Institute of International Education Scholarship (1991-1995)
- Shell Merit Scholarship (1990)
- Winner of the 1989 South African National Youth Science Olympiad (1989)
- 1989 London International Youth Science Fortnight South African Delegate (1989)
- Merit Certificate: Foundation for Education, Science and Technology (FEST) (1987)

RESEARCH INTERESTS

Computational Intelligence
System Identification
Finite Element Models
Multi-Agent Systems
Missing Data Estimation

MEMBERSHIP/FELLOWSHIPS/PROFESSIONAL REGISTRATION

- Fellow of the African Scientific Institute (2009)
- Fellow of the Royal Statistical Society (2008)
- Fellow of the Academy of Science of South Africa (2007)
- Fellow of the South African Academy of Engineering (2007)
- Fellow of the Royal Society for the Encouragement of Arts, Manufactures and Commerce (RSA) (2007)
- Fellow of the Council for Scientific and Industrial Research (2004)
- Fellow of the Cambridge Philosophical Society (1998)
- Fellow of the Cambridge Commonwealth Trust (1998)
- Senior Member of the IEEE (2008)
- Registered Professional Engineer (2005)
- Senior Member of the Association of Computing Machinery (ACM) (2009)
- Member of the IEEE Systems Man and Cybernetics Society (2006)
- Member of the IEEE Computational Intelligence Society (2006)

Editorial Responsibilities:

- Associate Editor: International Journal of Systems Science (2007-)
- Associate Editor: Journal of Computers (2008-)
- Associate Editor: South African Journal of Science (2009-)
- Associate Editor: International Journal on Advances in Information Sciences and Service Sciences (2010-)
- Associate Editor: ICIC Express Letters (*An International Journal of Research and Surveys*) (2007-)
- Editorial Board: Open Aerospace Engineering Journal (2007-)
- Editorial Advisory Board: International Journal of Engineering Research in Africa (JERA) (2009-)

PUBLICATIONS**Patents:**

- P-1. D.M. Starfield, D.M. Rubin and **T. Marwala**. United States Patent: 20080296504 “Method and Apparatus for Radiation Imaging”
- P-2. D.M. Starfield, D.M. Rubin and **T. Marwala**. PCT/IB2008/001278 (22.05.2008) “Coded Aperture Masks for Radiation-Based Medical Imaging”.
- P-3. M.J. Russell, D.M. Rubin, B. Wigdorowitz and **T. Marwala**. (SA Provisional Patent: 2008/05078) “An artificial larynx”

Books:

- B-1. **T. Marwala**. Computational Intelligence for Modelling Complex Systems. *Research India Publications*, 2007, ISBN: 978-81-904362-1-2.
- B-2. N. Callaos, W. Lesso, C.D. Zinn, J. Baralt, J. Boukachour, C. White, **T. Marwala** and F.V. Nelwamondo (Editors). The Proceedings of the 12th World Multi Conference on Systemics, Cybernetics and Informatics, Florida *International Institute of Informatics and Systematics Publication*, Vol. 5, 2008, ISBN: 13:978-1-934272-35-0.

- B-3. **T. Marwala**. Computational Intelligence for Missing Data Imputation, Estimation and Management: Knowledge Optimization Techniques. *IGI Global Publications, Information Science Reference Imprint, IGI Global Publications, New York*, ISBN: 1-60566-336-0, April 2009.
- B-4. **T. Marwala**. Finite Element Model Updating Using Computational Intelligence Techniques. *Springer*, London, UK (in press).

Peer Reviewed Book Chapters and Monographs:

- Ch-1. **T. Marwala** and H.E.M. Hunt. Fault identification using a committee of neural networks. *Identification in Engineering Systems* 102-111 (1999), Swansea Wales, UK., (Eds.) M.I. Friswell, J.E. Mottershead and A.W. Lees
- Ch-2. **T. Marwala** and H.E.M. Hunt. Comparison between maximum likelihood and Bayesian networks for fault identification. *Advanced Problems in Vibration Theory and Applications* 255-261 (2000), X'ian, Peoples Republic of China (Ed. Z. Zhang).
- Ch-3. J.M. Spiller and **T. Marwala**. Medical Image Segmentation and Localization using Deformable Templates. *In Imaging the Future Medicine*, Proceedings of the IFMBE, 2006, Vol. 14, pp. 3581-3585, Springer-Verlag, Berlin Heidelberg. Eds. Sun I. Kim and Tae Suk Sah, ISBN: 978-3-540-36839-7.
- Ch-4. D.L. Falk, D.M. Rubin and **T. Marwala**. Enhancement of Noisy Planar Nuclear Medicine Images using Mean Field Annealing. *In Imaging the Future Medicine*, Proceedings of the IFMBE, 2006, Vol. 14, pp. 3581-3585, Springer-Verlag, Berlin Heidelberg. Eds. Sun I. Kim and Tae Suk Sah, ISBN: 978-3-540-36839-7.
- Ch-5. T.N. Tim and **T. Marwala**. Computational Intelligence Methods for Risk Assessment of HIV. *In Imaging the Future Medicine*, Proceedings of the IFMBE, 2006, Vol. 14, pp. 3581-3585, Springer-Verlag, Berlin Heidelberg. Eds. Sun I. Kim and Tae Suk Sah, ISBN: 978-3-540-36839-7.
- Ch-6. D.M. Starfield, D.M. Rubin and **T. Marwala**. Near-Field Artifact Reduction using Realistic Limited-Field-of-View Coded Apertures in Planar Nuclear Medicine Imaging. *In Imaging the Future Medicine*, Proceedings of the IFMBE, 2006, Vol. 14, pp. 3581-3585, Springer-Verlag, Berlin Heidelberg. Eds. Sun I. Kim and Tae Suk Sah, ISBN: 978-3-540-36839-7.
- Ch-7. D.M. Starfield, D.M. Rubin and **T. Marwala**. Sampling Considerations and Resolution Enhancement in Ideal Planar Coded Aperture Nuclear Medicine Imaging, pp. 806-809. 11th Mediterranean Conference on Medical and Biological Engineering June 2007, Ljubljana, Slovenia (IFMBE Proceedings vol. 16) (Paperback) and Computing 2007: MEDICON 2007, 26-30 by Tomaz Jarm (Editor), Peter Kramar (Editor), Anze Zupanic (Editor) Springer, ISBN-10: 3540730435.
- Ch-8. T. Tettey **T. Marwala** Neuro-fuzzy modeling and fuzzy rule extraction applied to conflict management. *Lecture Notes in Computer Science*, Volume 4234, 2006, pp. 1087-1094, Springer-Verlag, Berlin Heidelberg.
- Ch-9. F. Soares, J. Burken, **T. Marwala**. Neural network applications in advanced aircraft flight control system, a hybrid system, a flight test demonstration. *Lecture Notes in Computer Science*, Volume 4234, 2006, pp. 684-691, Springer-Verlag, Berlin Heidelberg.
- Ch-10. P. Patel and **T. Marwala**. Neural networks, fuzzy inference systems and adaptive-neuro fuzzy inference systems for financial decision making. *Lecture Notes in Computer Science*, Volume 4234, 2006, pp. 430-439, Springer-Verlag, Berlin Heidelberg.

- Ch-11. D. Lunga, **T. Marwala**. Online forecasting of stock market movement direction using the improved incremental algorithm. *Lecture Notes in Computer Science*, Volume 4234, 2006, pp. 440-449, Springer-Verlag, Berlin Heidelberg.
- Ch-12. D. Lunga and **T. Marwala**. Time Series Analysis Using Fractal Theory and Online Ensemble Classifiers. *Lectures Notes in Artificial Intelligence*, 2006, Volume 4304/2006, pp. 312-321, Springer-Verlag, Berlin Heidelberg.
- Ch-13. F.V. Nelwamondo and **T. Marwala**. Handling Missing Data from Heteroskedastic and Nonstationary Data. *Lecture Notes in Computer Science*, 2007, vol. 4491, no. 1, pp. 1297-1306, Springer-Verlag, Berlin Heidelberg.
- Ch-14. B. Vilakazi and **T. Marwala**. Incremental Learning and Its Application to Bushing Condition Monitoring. *Lecture Notes in Computer Science*, 2007, vol. 4491, no. 1, pp. 1241-1250, Springer-Verlag, Berlin Heidelberg.
- Ch-15. Bodie Crossingham, **T. Marwala**. Using Genetic Algorithms to Optimise Rough Set Partition Sizes for HIV Data Analysis. *Studies in Computational Intelligence*, Springer-Verlag, vol. 78, 2007, pp. 245-250, ISSN: 1860-949X.
- Ch-16. **T. Marwala** and B.C. Vilakazi. Condition Monitoring using Computational Intelligence, *Handbook on Computational Intelligence in Manufacturing and Production Management*, IGI Publishers Chapter 6, 2007, pp. 106-143, ISBN 1599045826.
- Ch-17. D.M. Starfield, D.M. Rubin and **T. Marwala**. Design of an ultra-near-field system for planar coded aperture nuclear medicine imaging. 2008, *Proceedings of the International Federation for Medical and Biological Engineering*, 2008, vol. 20, pp. 590-593, Springer, ISBN: 978-3-540-69366-6, Editors: Yuri Dekhtyar, Alexei Katashev and Janis Spigulis.
- Ch-18. Megan J. Russell, David M. Rubin, Brian Wigdorowitz and **T. Marwala**. The artificial larynx: A review of current technology and a proposal for future development. *Proceedings of the International Federation for Medical and Biological Engineering*, 2008, vol. 20, pp. 160-163, Springer, ISBN: 978-3-540-69366-6, Editors: Yuri Dekhtyar, Alexei Katashev and Janis Spigulis.
- Ch-19. B.C. Vilakazi and **T. Marwala**. Computational Intelligence Approach to Bushing Condition Monitoring: Incremental learning and its Application. *In Intelligent Engineering Systems and Computational Cybernetics*, Springer-Verlag, Machado, J.A. Tenreiro; Pátkai, Béla; Rudas, Imre J. (Eds.) 2008, ISBN: 978-1-4020-8677-9.
- Ch-20. **T. Marwala** and Evan Hurwitz A Multi-Agent Approach to Bluffing. Chapter 11: *Multiaagent Systems*, Book edited by: Salman Ahmed and Mohd Noh Karsiti, ISBN 978-3-902613-51-6, pp. 233-246, February 2009, I-Tech, Vienna, Austria.
- Ch-21. Pretesh Patel and **T. Marwala**. Caller behaviour classification a Comparison of SVM and FIS Techniques. *Lecture Notes in Computer Science Springer, Advances in Intelligent and Soft Computing*, Editor-in-chief: Kacprzyk, J., Book Series Advances in Soft Computing, Publisher Springer Berlin / Heidelberg, ISSN 1615-3871 (Print) 1860-0794 (Online), Volume 116/2009, Book, DOI 10.1007/978-3-642-03156-4, ISBN 978-3-642-03155-7, Pages 199-208
- Ch-22. Adam Pantanowitz and **T. Marwala**. Missing Data Imputation Through the Use of the Random Forest Algorithm. *Lecture Notes in Computer Science Springer, Advances in Intelligent and Soft Computing*, Editor-in-chief: Kacprzyk, J., Book Series Advances in Soft Computing, Publisher Springer Berlin / Heidelberg, ISSN 1615-3871 (Print) 1860-0794 (Online), Volume 116/2009, Book, DOI 10.1007/978-3-642-03156-4, ISBN 978-3-642-03155-7, Pages 53-62.

- Ch-23. Adam Pantanowitz and **T. Marwala**. Evaluating the Impact of Missing Data Imputation. Lecture Notes in Computer Science Springer, Book Series Lecture Notes in Computer Science, Publisher Springer Berlin / Heidelberg , ISSN 0302-9743 (Print) 1611-3349, Volume 5678/2009, Book: Advanced Data Mining and Applications.
- Ch-24. L.M. Masisi, F.V. Nelwamondo and **T. Marwala** Investigating Ensemble Weight and the Certainty Distributions for Indicating Structural Diversity, Book Series Lecture Notes in Computer Science, Volume 5507/2009, Publisher Springer Berlin / Heidelberg, Book Advances in Neuro Information Processing, Pages 517-524.
- Ch-25. P. Patel and **T. Marwala** Caller Interaction Classification: A Comparison of Real and Binary Coded GA-MLP Techniques, Book Series Lecture Notes in Computer Science, Volume 5507/2009, Publisher Springer Berlin / Heidelberg, Book Advances in Neuro Information Processing, Pages 728-735.
- Ch-26. J. Mistry, F.V. Nelwamondo and **T. Marwala** Investigating Demographic Influences for HIV Classification Using Bayesian Autoassociative Neural Networks, Book Series Lecture Notes in Computer Science, Volume 5507/2009, Publisher Springer Berlin / Heidelberg, Book Advances in Neuro Information Processing Pages 752-759.
- Ch-27. N. Hlalele, F.V. Nelwamondo and **T. Marwala** Imputation of Missing Data Using PCA, Neuro-Fuzzy and Genetic Algorithms, Book Series Lecture Notes in Computer Science, Volume 5507/2009, Publisher Springer Berlin / Heidelberg, Book Advances in Neuro Information Processing Pages 485-492.
- Ch-28. Megan J Russell, David M Rubin, **T. Marwala**, Brian Wigdorowitz, Pattern Recognition and Feature Selection for the Development of a New Artificial Larynx. *11th World Congress on Medical Physics and Biomedical Engineering*, September 7-12, 2009 in Munich, Germany Dössel and W C. Schlegel. (Eds.): WC 2009, IFMBE Proceedings 25/IV, pp. 736–739, 2009.

Peer Reviewed Journal Publications:

- J-1. **T. Marwala** and P.S. Heyns. A multiple criterion method for detecting damage on structures. *American Institute of Aeronautics and Astronautics Journal*, 195 (1998), 1494-1501.
- J-2. **T. Marwala** and P.S. Heyns. New criteria for comparing frequency response functions. *Research & Development Journal*, 14 (1998), 49-55. **Bronze Medal from the SAIME.**
- J-3. **T. Marwala** and H.E.M. Hunt. Fault identification using finite element models and neural networks. *Mechanical Systems and Signal Processing*, 13 (1999), 475-490.
- J-4. **T. Marwala**. On damage identification using a committee of neural networks. *American Society of Civil Engineers, Journal of Engineering Mechanics*, 126 (2000), 43-50.
- J-5. **T. Marwala** and H.E.M. Hunt. Is damage identification using vibration data in a population of cylinders feasible? *Journal of Sound and Vibration*, 237 (2000), 727-732.
- J-6. **T. Marwala**. Probabilistic fault identification using a committee of neural networks and vibration data. *American Institute of Aeronautics and Astronautics, Journal of Aircraft*, 38 (2001) 138-146.
- J-7. **T. Marwala**. Scaled conjugate gradient and Bayesian training of neural networks for fault identification in cylinders. *Computers and Structures*, 79/32 (2001), 2793-2803.
- J-8. **T. Marwala**. On fault identification using pseudo-modal-energies and modal properties. *American Institute of Aeronautics and Astronautics Journal*, 39 (2001), 1608-1617.
- J-9. **T. Marwala**. Probabilistic fault identification using vibration data and neural networks. *Mechanical Systems and Signal Processing*, 15 (2001), 1109-1128. ISSN: 0888-3270.

- J-10. **T. Marwala**. Finite element updating using wavelet data and genetic algorithm. *American Institute of Aeronautics and Astronautics, Journal of Aircraft*, 39 (2002), 709-711.
- J-11. **T. Marwala**. Fault classification using pseudo modal energies and neural networks. *American Institute of Aeronautics and Astronautics Journal*, 2003, 41(1), 82-89.
- J-12. **T. Marwala**. Control of complex systems using Bayesian neural networks and genetic algorithm, *International Journal of Engineering Simulation*, 2004, 5(2), 28-37.
- J-13. **T. Marwala**. Fault classification using pseudo modal energies and probabilistic neural networks. *American Society of Civil Engineers, Journal of Engineering Mechanics*, 2004, 130(11), pp. 1346-1355.
- J-14. **T. Marwala** and S. Sibisi. Finite element updating using Bayesian framework and modal properties *American Institute of Aeronautics and Astronautics, Journal of Aircraft*, 2005, 42(1), pp. 275-278.
- J-15. **T. Marwala**. Finite element model updating using particle swarm optimization. *International Journal of Engineering Simulation*, 2005, 6(2), pp. 25-30.
- J-16. M. Lagazio and **T. Marwala**. Assessing different Bayesian neural network models for militarized interstate dispute. *Social Science Computer Review*, 2005, 24(1), pp. 1-12.
- J-17. L.A. Machowski and **T. Marwala**. Using object oriented calculation process framework and neural networks for classification of image shapes. *International Journal of Innovative Computing, Information and Control*, 2005, 1(4), pp. 609-623.
- J-18. M. Abdella and **T. Marwala**. The use of genetic algorithms and neural networks to approximate missing data in database. *Computing and Informatics*, 2006, 24, pp. 1001-1013.
- J-19. N. Mohamed, D. Rubin and **T. Marwala**. Detection of epileptiform activity in human EEG signals using Bayesian neural networks. *Neural Information Processing – Letters and Reviews*, 2006, 10(1), pp. 1-10.
- J-20. S. Chakraverty, **T. Marwala** and P. Gupta. Response prediction of structural system subject to earthquake motions using artificial neural network. *Asian Journal of Civil Engineering*, 2006, 7(3), pp. 301-308.
- J-21. **T. Marwala** and S. Chakraverty. Fault classification in structures with incomplete measured data using autoassociative neural networks and genetic algorithm. *Current Science*, 2006, 90(4), pp. 542-548.
- J-22. **T. Marwala**, S. Chakraverty, U. Mahola. Fault classification using multi-layer perceptrons and support vector machines. *International Journal of Engineering Simulation*, 2006, vol. 7, no. 1, pp. 29-35.
- J-23. S.M. Dhlamini, F.V. Nelwamondo and **T. Marwala**. Condition monitoring of HV bushings in the presence of missing data using evolutionary computing. *Transactions on Power Systems*, 2006, 1(2), pp. 296-302.
- J-24. Fulufhelo V. Nelwamondo, **T. Marwala** and Unathi Mahola Early Classifications of bearing faults using hidden Markov models, Gaussian mixture models, Mel-frequency Cepstral coefficients and fractals. *International Journal of Innovative Computing, Information and Control*, 2006, Vol. 2, No. 6, pp. 1281-1299.
- J-25. Brain Betechuoh Leke, **T. Marwala** and Thando Tettey. Autoencoder networks for HIV classification. *Current Science*, 2006, vol. 91, no. 11, pp. 1467-1473.
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- J-27. B. Leke, **T. Marwala**, T. Tim and M. Lagazio. Using genetic algorithms versus line search optimization for HIV Predictions. *Transactions on Information Science and Applications*, 2006, 4(3), pp. 684-690.

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- C-103. Bo Xing, Wenjing Gao, Fulufhelo V. Nelwamondo, Kimberly Battle, and Tshilidzi Marwala. Part-Machine Clustering: the Comparison between Adaptive Resonance Theory Neural Network and Ant Colony System has been accepted for presentation at the 7th International Symposium on Neural Networks (ISNN 2010) *Lecture Notes in Electrical Engineering*, Springer (accepted)
- C-104. Bo Xing, Wenjing Gao, Fulufhelo V. Nelwamondo, Kimberly Battle, and Tshilidzi Marwala. Two-Stage Inter-Cell Layout Design for Cellular Manufacturing by Using Ant Colony Optimization Algorithms. *International Conference on Swarm Intelligence (ICSI 2010) Lecture Notes in Computer Science* (accepted)

- C-105. Bo Xing, Wenjing Gao, Fulufhelo V. Nelwamondo, Kimberly Battle, and Tshilidzi Marwala. Cellular Manufacturing System Scheduling under Fuzzy Constraints: a Group Technology Perspective. FUZZ-IEEE 2010 (accepted)
- C-106. Bo Xing, Wenjing Gao, Fulufhelo V. Nelwamondo, Kimberly Battle, and Tshilidzi Marwala. Ant Colony Optimization for Automated Storage and Retrieval System. IEEE CEC 2010 (accepted)

Selected Papers in Local/Popular Journals/Magazines/Archives:

- T-1. **T. Marwala.** Using computers to monitor the health of structures. *Science in Africa*, Issue. 27, June 2003.
- T-2. **T. Marwala.** *Column:* Moulding leaders for 21st-century challenges. *City Press*, 24 April 2005, p. 18.
- T-3. **T. Marwala.** Condition monitoring of mechanical systems. *Electricity + Control*, January 2005, pp. 33-35.
- T-4. **T. Marwala.** The artificial beer taster. *Electricity + Control*, May 2005, pp. 22-23.
- T-5. **T. Marwala.** Mobilising the cadre to defeat the challenges of the 21st century. *Umrabulo*, Vol. 23, 2005, pp. 80-82.
- T-6. **T. Marwala.** Strategies and tactics for increasing economic participation. *Umrabulo*, Vol. 24, 2005, pp. 41-43.
- T-7. **T. Marwala.** Bridging the digital divide. *South Africa: The Quarterly Journal for Trade Partners and Investors*. Vol. 3, No. 4, 2006, pp. 19-22.
- T-8. **T. Marwala.** *Column:* Power blackouts can be beaten. *City Press*, 5 March 2006, p. 22.
- T-9. **T. Marwala.** Local Loop Unbundling. *EngineerIT* April 2007, page. 8.
- T-10. E. Marais, **T. Marwala.** Predicting the presence of internet worms using novelty detection. *ArXiv: 0705.1288*.
- T-11. **T. Marwala.** *Column:* South Africa's economy can be revolutionised. *City Press*, 30 April 2006, pp. 22.
- T-12. **T. Marwala.** Skills necessary for the advancement of South Africa. In *Umrabulo*, Vol. 26, 2006, pp. 60-61.
- T-13. **T. Marwala.** Prospects for improved skills capacity. In *Umrabulo*, Vol. 28, 2007, pp. 6-8.
- T-14. **T. Marwala.** The anatomy of capital and the National Democratic Revolution. In *Umrabulo*, Vol. 29, 2007, pp. 57-59.
- T-15. **T. Marwala.** Local loop unbundling recommendations - What does it mean for an ordinary person? *EngineerIT* p. 10, June 2007.
- T-16. **T. Marwala.** Letters: The Chinese Century. *Time Magazine*. February 2007, Vol. 169, No. 6, p. 10.
- T-17. **T. Marwala.** Building human capital in South Africa. *Acumen 3rd Quarter* 2007, pp. 22-29.
- T-18. **T. Marwala.** Letters: A South African success story. *Time Magazine*, 22 September 2008, p.8.
- T-19. **T. Marwala.** Letters: Democracy in South Africa. *Time Magazine*, 30 April 2009, p.8.
- T-20. **T. Marwala.** Letters: First amongst equals. *The Economist* 16 May 2009, p. 20.
- T-21. Baruch Lubinsky, Bakir Genc and **T. Marwala.** Dynamically Weighted Mixture of Experts for the Prediction of Platinum Prices. arXiv:0812.2785 (December 2008).
- T-22. Sarah Wright, **T. Marwala.** Artificial Intelligence Techniques for Steam Generator Modelling. 2006, arXiv:0811.1711.

- T-23. Dan Golding, Linda Wilson, **T. Marwala**. Emergency Centre Organization and Automated Triage System. 2008, arXiv:0810.3671.
- T-24. Darren Blend and **T. Marwala**. Comparison of Data Imputation Techniques and their Impact. 2008, arXiv:0812.1539.
- T-25. D. Moon and **T. Marwala**. Missing Data using Decision Forest and Computational Intelligence. 2008, arXiv:0812.1615.
- T-26. **T. Marwala**. Foundations for a Developmental State: A case for technical education, 2009, arXiv:0907.2019.
- T-27. Evan Hurwitz and **Tshilidzi Marwala** Machine Learning Techniques to Portfolio Optimisation. arXiv:0910.2276

Theses:

- T-28. **T. Marwala**. Fault identification using neural networks and vibration data. Doctor of Philosophy Topic, *University of Cambridge*, 2001. (Supervisor: Dr. HEM Hunt)
- T-29. **T. Marwala**. Multi-criteria method for determining damage on structures. Masters of Engineering Topic, *University of Pretoria*, 1997. (Supervisor: Prof. PS Heyns)

LEADERSHIP EXPERIENCE:

- Programme Committee: The First International Symposium on Information Management (ISIKM2010) Venue/Country: Dalian, China (2010)
- Programme Committee: The 14th World Multi-Conference on Systemics, Cybernetics and Informatics: WMSCI 2010.
- International Advisory Committee: International Conference on 'Challenges and Applications of Mathematics in Science and Technology (CAMIST)' (11-Jan-2010 to 13-Jan-2010), Orissa, India.
- International Program Committee: The Third IASTED African Conference on Modelling and Simulation, Botswana, (2010).
- Conference Committee: GAMEON'2009, November 26-28, 2009, Media design Hochschule, Duesseldorf, Germany.
- Program Committee: Invention 2009, Poland.
- International Committee: 8th International Symposium on Soft Computing for Industry (ISSCI), Kobe, Japan (2010).
- Program Committee: Symposium on Intelligent Informatics (ISII2009), QinHuangDao, China, (2009).
- Program Committee: The 13th World Multi-Conference on Systemics, Cybernetics and Informatics: WMSCI 2009, Orlando, USA (2009)
- International Program Technical Committee: Africon 2009, Kenya, (2009).
- Organizing Committee: International Workshop on Stochastic and Applied Global Optimization, Johannesburg, South Africa, (2008).
- International Program Committee: IASTED International Conference on Modelling and Simulation (Africa-MS), Botswana, (2007)
- Invited Talk: Asia-Pacific Workshop on Structural Health Monitoring, Japan, (2006)
- Member of the Technical Committee: World Congress in Computational Intelligence (WCCI2008) Hong Kong, China
- Member of the Steering Committee: 19th World Congress of the International Federation of Automatic Control, Cape Town, South Africa 2014.

- International Technical Committee: BIONETICS 2007, Hungary.
- Scientific Committee: GAMEON-NA 2007, University of Florida, USA.
- Scientific Committee: GAMEON 2007, University of Bologna, Italy.
- Moderator: Science and Technology Policy Forum, Tokyo, Japan (2005)
- Chair of 5 Sessions: IEEE International Conference on Systems, Man and Cybernetics, Taiwan, (2006)
- Chair of 2 Sessions: World Congress on Computational Intelligence, Vancouver, Canada (2006)
- Member of Scientific Committee: The 2006 IASME/WSEAS International Conference on Energy and Environmental Systems, 2006, Chalkis, Evia Island, Greece, Portugal (2006)
- Member of Scientific Committee: The 6th WSEAS International Conference on Power Systems, 2006, Lisbon, Portugal (2006)
- Chair of Session: International Symposium on Neural Networks and Soft Computing, Krakow, Poland, (2005)
- Chair of Session: International Conference on Computational Cybernetics, Mauritius (2005)
- Chairman of Delegation of City Power Johannesburg: Negotiations with the Municipal Workers Union of South Africa (2005)
- Chairman of the National Advisory Council on Innovation Delegation: Parliament of the Republic of South Africa Portfolio Committee on Science and Technology – Annual Report (2005) and Business Plan (2006)
- Chair of Session: International Symposia on Soft Computing & Intelligent Systems for Industry, Scotland (2001).

STUDENT SUPERVISION

Master's Supervision:

1. Mr. Lungile Mndileki Zanoxolo Mdlazi, 2003, M.Eng. (Mechanical Engineering), Completed with distinction in Thesis, University of Pretoria. Topic: A synchronous filter for gear vibration monitoring using computational intelligence. Where last tracked? Senior Engineer at Anglo American Corporation
2. Mr. Nadim Mohamed, 2003, M.Sc. (Electrical Engineering) – Completed with a distinction University of the Witwatersrand Topic: Detection of Epileptic Activity in the EEG Using Artificial Neural Networks Where last tracked? Consultant at Accenture
3. Brain Betechuoh Leke, 2005, M.Sc. (Electrical Engineering) – Completed with a distinction University of the Witwatersrand. Topic: Optimal Selection of Stocks Using Computational Intelligence Methods. Where last tracked? Systems Engineer in a Johannesburg based company
4. Mr. Zaheer Ahmed Dindar, 2005, M.Sc (Electrical Engineering) – Completed. University of the Witwatersrand. Topic: Artificial Neural Networks Applied to Option Pricing. Where last tracked? IT Engineer in London England
5. Mr. Michael M. Pires, 2005, M.Sc. (Electrical Engineering) – Completed with a distinction, University of the Witwatersrand. Topic: Option Pricing Using Support Vector Machines and Neural Networks. Where last tracked? IT Engineer at Standard Bank
6. Mr. Bradley van Aardt, 2005, M.Sc. (Electrical Engineering) – Completed. University of the Witwatersrand. Topic: Multi-Agent Communication and Collaboration. Where last tracked? IT Engineer at Entelect Solutions

7. Mr. Lukasz A. Machowski, 2005, M.Sc. (Electrical Engineering) – Completed with a distinction, University of the Witwatersrand. Topic: Image shape classification using computational intelligence and object orientation. Where last tracked? IT Engineer in Johannesburg
8. Mr. Mussa Abdella, 2006, M.Sc. (Electrical Engineering)–Completed with distinction in Topic, University of the Witwatersrand. Topic: The use of genetic algorithms and neural networks to approximate missing data in database. Where last tracked? IT Engineer in Norway
9. Mr. E Habtemariam, 2006, M.Sc. (Electrical Engineering)–Completed with distinction in thesis, University of the Witwatersrand. Topic: Artificial intelligence for conflict management. Where last tracked? IT Engineer in Johannesburg
10. Mr. Elbert Marais, 2006, M.Sc. (Electrical Engineering) – Completed. University of the Witwatersrand. Topic: Predicting global internet instability caused by worms using neural networks. Where last tracked? Manager in a Johannesburg based company
11. Mr. Trevor Ransome, 2006, M.Sc. (Electrical Engineering) – Completed. University of the Witwatersrand. Topic: Automatic minimization of patient setup errors in proton beam therapy. Where last tracked? IT Engineer in Cape Town
12. Mr. Gareth Setati, 2007, M.Sc. (Electrical Engineering) – Completed. University of the Witwatersrand. Topic: Machine learning for decision-support in distributed networks. Where last tracked? IT Engineer at SAP in Germany
13. Ms. Morongwe Malebye, 2007, M.B.A. – Completed. University of the Witwatersrand. Topic: Forecasting the JSE All Index share using neural network techniques. Where last tracked? CEO of a Johannesburg based company
14. Mr. T. Djonon Hypolyte, 2007, M.Sc. (Electrical Engineering) – Completed. University of the Witwatersrand. Topic: Machine condition monitoring using neural networks: feature selection using genetic algorithm . Where last tracked? IT Engineer in Johannesburg
15. Ms. Taryn Tim, 2007, M.Sc. (Electrical Engineering) – Completed with Distinction, University of the Witwatersrand. Topic: Predicting HIV status using neural networks and demographic factors. Where last tracked? Systems Engineer at SABMiller
16. Mr. Pretesh Patel, 2007, M.Sc. (Electrical Engineering) – Completed. University of the Witwatersrand. Topic: A forecasting of indices and corresponding investment decision making application. Where last tracked? Engineer in Johannesburg based company
17. Mr. Simon Scurrrell, 2007, M.Sc. (Electrical Engineering) – Completed. University of the Witwatersrand. Topic: Automatic detection of pulmonary embolism using computational intelligence. Where last tracked? Engineer in London England
18. Mr. Evan Hurwitz, 2007, .Sc. (Electrical Engineering) – Completed. University of the Witwatersrand. Topic: Multi-Agent Modelling using Intelligent Agents in Competitive Games. Where last tracked? Engineer at EOH (Pty) Ltd
19. Mr. Lunga Dalton, 2007, M.Sc. (Electrical Engineering) – Completed with Distinction, University of the Witwatersrand. Topic: Time series analysis using fractal theory and ensemble classifiers with application to stock portfolio optimization. Where last tracked? Researcher at Purdue University, USA
20. Mr. Dhires Surajpal, 2007, M.Sc. (Electrical Engineering) – Completed with Distinction, University of the Witwatersrand. Topic: An independent evaluation of subspace facial recognition algorithms. Where last tracked? Consultant at Accenture
21. Mr. Thando Tettey, 2007, M.Sc. (Electrical Engineering) – Completed with Distinction, University of the Witwatersrand. Topic: A computational intelligence approach to modelling interstate conflict: Conflict and causal interpretations. Where last tracked? Engineer at a Defense Industry

22. Mr. Shakir Mohamed, 2007, M.Sc. (Electrical Engineering) – Completed with Distinction, University of the Witwatersrand. Topic: Dynamic protein classification: adaptive models based on incremental learning strategies. Where last tracked? Researcher at the University of Cambridge
23. Mr. Michael Herzog, 2007, MEng (Mechanical Engineering)–Completed with Distinction, University of Pretoria. Topic: Machine and component residual life estimation through the application of neural networks. Where last tracked? Engineer in Johannesburg
24. Ms. Busisiwe Vilakazi, 2007, M.Sc. (Electrical Engineering) – Completed with Distinction, University of the Witwatersrand. Topic: Machine condition monitoring using artificial intelligence: The incremental learning and multi-agent system approach. Where last tracked? Researcher at Oxford University
25. Mr. Daniyel Falk, 2007, M.Sc. (Electrical Engineering) – Completed. University of the Witwatersrand. Topic: Enhancement of Noisy Planar Nuclear Medicine Images using Mean Field Annealing. Where last tracked? IT Engineer in Johannesburg
26. Mr. Jonathan Spiller, 2007, M.Sc. (Electrical Engineering) – Completed. University of the Witwatersrand. Topic: Object localization using deformable templates. Where last tracked? Engineer in London England
27. Mr. Bodie Crossingham, 2008, M.Sc. (Electrical Engineering) – Completed. University of the Witwatersrand. Topic: Rough Set Partitioning Using Computational Intelligence Approach. Where last tracked? Consultant Accenture
28. Mr. Greg Hulley, 2008, M.Sc. (Electrical Engineering) – Completed. University of the Witwatersrand. Topic: Incremental Learning Algorithms Applied to Flow Cytometry Data for Multi-Class Diagnosis of Leukemia. Where last tracked? F.L. Schmidt Minerals
29. Mr. Bunty Kiremile, 2008, M.Sc. (Electrical Engineering) – Completed. University of the Witwatersrand. Topic: Non-stationarity Detection
30. Nthabiseng Unathi Hlalele MSc (Electrical Engineering) – Completed with Distinction. University of the Witwatersrand. Topic: The impact of missing data imputation on HIV classification
31. Vukosi Marivate MSc (Electrical Engineering) – Completed. University of the Witwatersrand. Topic: Investigation into the effect of social learning in reinforcement learning board game playing agents
32. Jaisheel Mistry MSc (Electrical Engineering) – Completed. University of the Witwatersrand. Topic: Estimating Missing Data with Confidence Intervals
33. Lesedi Masisi MSc (Electrical Engineering) – Completed. University of the Witwatersrand. Topic: Investigating the structural diversity within a committee of classifiers and their generalization performance.
34. Tendani Malumedzha MSc (Electrical Engineering) – Completed. University of the Witwatersrand. Topic: Modeling Multiple Object Scenarios for Feature Recognition and Classification Using Cellular Neural Networks
35. Wabo Majavu MSc (Electrical Engineering) – Completed. University of the Witwatersrand. Topic: Classification of web resident sensor resources using latent semantic indexing and ontologies

Doctoral Supervision:

1. Dr. Sizwe M. Dhlamini, 2007, Ph.D. (Electrical Engineering) – Completed. University of the Witwatersrand. Topic: Bushing diagnosis using artificial intelligence and dissolved gas analysis. Where last tracked? Senior Engineering Manager at Sondolo IT

2. Dr. Fulufhelo Vincent Nelwamondo, 2008, Ph.D. (Electrical Engineering) – Completed. University of the Witwatersrand. Topic: Computational intelligence techniques for missing data imputation. Where last tracked? Post-Doctoral Fellowship at Harvard University
3. Dr. Brain Betechuoh Leke, 2008, Ph.D. (Electrical Engineering) – Completed. University of the Witwatersrand. Topic: Computational Intelligence for Modelling HIV. Where last tracked? IT Engineer in Johannesburg
4. David Starfield, Ph.D. (Electrical Engineering) – Completed. University of the Witwatersrand. Topic: Towards clinically useful coded apertures for planar nuclear medicine imaging. Where last tracked? Engineer in Texas, USA
5. Pretesh Bhoola Patel, Ph.D. (Electrical Engineering) – Submitted. University of the Witwatersrand. Topic: An IVR Call Performance Classification System Using Computational Intelligence Techniques. Where last tracked? Engineer in Johannesburg

Students Currently Under Supervision:

1. Evan Hurwitz, Ph.D.
2. Linda Mthembu, Ph.D.
3. Meir Perez, Ph.D.
4. Megan Russell, Ph.D.
5. George Anderson, Ph.D.
6. Mlungisi Duma, Ph.D.
7. Bolanle Abe, Ph.D.
8. Bo Xing, D.Eng.
9. A.K. Mohamed, M.Sc.

Post-Doctoral Fellowship Supervision:

- Dr. Anthony Gidudu PhD (UCT) Remote Sensing University of the Witwatersrand

Selected Journal, Conference and Grant Reviewer:

- Engineering Applications of Artificial Intelligence
- Information Sciences
- IEEE Transactions on Systems, Man and Cybernetics
- IEEE Transactions on Neural Networks
- Mechanical Systems and Signal Processing
- European Journal of Operations Research
- European Journal of Mechanics
- Engineering Structures
- Journal of Sound and Vibration
- Smart Materials and Structures
- Pattern Recognition Letters
- International Journal of Pattern Recognition
- Pattern Recognition
- Mathematical Problems in Engineering
- AutoSoft: Intelligent Automation & Soft Computing
- Applied Artificial Intelligence
- Annals of Biomedical Engineering

- ASCE Journal of Bridge Engineering
- Computer Methods and Programs in Biomedicine
- Fuzzy Sets and Systems; Fuzzy Economic Review
- Measurement Science and Technology
- Indian Journal of Mathematics (IJM)/BAMS
- Journal of Mechanical Engineering Research (JMER)
- International Journal on Advances in Information Sciences and Service Sciences
- South African Transactions of Electrical Engineering
- South African Journal of Science
- Journal of the South African Institute of Mining and Metallurgy
- Botswana Journal of Technology
- 2005 IEEE International Conference on Service Operations and Logistics, and Informatics;
- 2007 IEEE International Symposium on Industrial Electronics
- 2007 The 33rd Annual Conference of the IEEE Industrial Electronics Society
- 2008 IEEE International Conference on Industrial Technology
- 2008 IFAC World Congress
- 2008 IEEE International Conference on Systems, Man and Cybernetics
- Handbook of Computational Intelligence in Manufacturing and Production Management-IGI Global Publishers.

Major Conference Attendance and Presentation:

- Tutorial Chair: "Impact of Missing Data Estimation" The Third IASTED African Conference on Modelling and Simulation 2010, Science and Technology Applications for Health and Sustainable Development, September 6 – 8, 2010, Gaborone, Botswana
- Invited Keynote Speaker: The South African Conference on Applied Mechanics (SACAM), 2010.
- Invited Keynote Speaker: IASTED Conference on Modelling and Simulation 2008, Gaborone, Botswana
- Invited Speaker: 2007 India Calling (Indian Merchants of Commerce and Business Unity South Africa), Sandton, South Africa.
- Invited Speaker: 2007 Wolfson College, University of Cambridge. Title: "Modelling of complex systems using computational intelligence techniques"
- Invited Speaker: 2007 IBSA (India, Brazil South Africa) Summit
- Invited Plenary Speaker: GovTech 2007, Cape Town, South Africa
- Invited Keynote Speaker: CESPAM Executive Training Programme "Combating Cybercrime in the SADC Region" 23rd-26th April, 2007, Cape Town, South Africa
- Member of the Bid Committee of the 19th World Congress of International Federation of Automatic Control, Toulouse, France.
- Invited to attend the World Bank Conference on Knowledge for Africa's Development, Johannesburg, 2006.
- Invited by the Presidency of South Africa to attend the 6th Presidential International Advisory Council on Information Society and Development 2006
- Invited as a Special Guest at the US-Japan Workshop on Bio-Inspired Sensor Networks: Learning from Life, Yokohama, Japan, 2006.
- Invited Speaker: Asia-Pacific Workshop on Structural Health Monitoring, Yokohama, Japan (2006)

- Invited Researcher: International Workshop on Scientific and Technological Manufacturing Research January 31-February 4, 2005 University of Johannesburg, South Africa
- Invited by the South African Embassy in Japan to attend the Science and Technology Policy Forum, Tokyo, Japan, 2005.
- Invited Delegate at the South African Public Management Conversation, Fancourt, George, 2005.
- Invited Delegate by IBM to attend the Executive Conference on Building the Information Society in Europe – 2004, Paris, France, May 2004.
- Invited Delegate Johannesburg + 2 Sustainable Development Conference, Sandton, 2004.
- Invited Researcher in the Microsoft Research Academic Conference, Cape Town, 2003.
- Invited Delegate at the United Nations World Summit on Sustainable Development, Johannesburg, 2002.

Visiting Professors/Researchers Hosted:

- Prof. Akira Mita, Keio University, Japan (2005)
- Prof. Rosalyn Hobson, Virginia Commonwealth University, USA (2005, 2006)
- Dr. Fola Soares, Contek Research, U.S.A. (2005)
- Dr. Snehashish Chakraverty, India (2005, 2006)

International and National Collaborations:

- Virginia Commonwealth University, Virginia, USA, (2004-2008). Speech recognition (collaborator Prof. Rosalyn Hobson)
- University of Windsor, Ontario, Canada,(2006-2007). Bioinformatics (collaborator Dr. Alioune Ngom)
- Contek Research, El Segundo, California, U.S.A. (2005-2008). Control methods for flight test (collaborator Dr. Fola Soares)
- NASA Dryden Flight Research Center, Edwards, CA, U.S.A, (2005-2007). Control methods for flight test (collaborator Dr. John Burken)
- Universities of Bristol/University of Swansea, U.K., (2000-2007). Finite element model updating (collaborator Dr. Sondipon Adhikari)
- Central Building Research Institute, Roorkee, India (2003-2006). Structural Health Monitoring (collaborator Dr. Snehashish Chakraverty)
- University of Kent, UK (2004-2006). Interstate Conflict (collaborator Dr. Monica Lagazio)
- Keio University, Japan (2005). Condition Monitoring (collaborator Prof. Akira Mita)
- Council for Scientific and Industrial Research (CSIR) (2003-2005). Finite element model updating (collaborator: Dr. Sibusiso Sibisi President of CSIR)
- University of Pretoria (2003-2008). Fault identification (collaborator: Prof. P.S. Heyns)
- University of Swansea (2008-present). Finite Element Updating (Collaborators: Profs. M.I. Friswell and S. Adhikari)

Research Grant Received:

- | | | |
|--|-------------|-------------|
| • National Research Foundation
Modelling of financial markets | ZAR 243 000 | (2004-2006) |
| • Armscor/Kentron
Automatic target recognition | ZAR 212 000 | (2004-2005) |

• Armscor/CSIR DefenceTek Information warfare	ZAR1 137 000	(2004-2006)
• Friedel Sellschop Award Financial modelling	ZAR 75 000	(2004)
• Dr. T.W. Kambule Research Awards	ZAR 50 000	(2004)
• CSIR Fellowship	ZAR 70 000	(2004)
• Indo-South Africa Research Collaboration Condition monitoring	ZAR 120 000	(2004-2006)
• Swedish/South Africa Research Collaboration Condition monitoring	ZAR 120 000	(2004-2006)
• National Research Foundation Condition monitoring	ZAR 479 000	(2005-2007)
• THRIP	ZAR 315 000	(2005)
• THRIP	ZAR 390 000	(2006)
• DST/NRF Chair	ZAR10 million	(2007-2012)
• Eskom	ZAR 500 000	(2004-2008)

Visiting Professorship/Researcher/Fellow:

- New University of Lisbon, Portugal, 2001
- Central Building Institute, CSIR, India, 2005
- Keio University, Japan, 2005
- Harvard University, 2006
- Wolfson College, University of Cambridge, 2007

Charitable Initiatives:

- Personal Donation to Tshivhambe Lower Primary School – R30,000.00 – Computers (2007)
- Raised funds from the Carl and Emily Fuchs Foundation for Mbilwi Secondary School, an SET school – R130,000.00 – Science Labs (2006-2010)
- Raised funds from the Carl and Emily Fuchs Foundation for Tshilidzini Special School for the disabled people. – R25,000.00 – Science Education (2008)
- Raised funds from the Carl and Emily Fuchs Foundation Ligege Secondary School – R15,000.00 – Science Education (2009)

Reference:

Available upon request