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PLACE OF BIRTH: Duthuni, Venda, Republic of South Africa

DATE OF BIRTH: 28 July 1971

CITIZENSHIP: South African

SPOUSE: Dr Jabulile Vuyiswa Manana BSc (UP¹) BSc (Hons) (UP) MSc (UP) MBBCh (Wits²)

CHILDREN: Nhlonipho Khathutshelo Marwala (Son)

PROFESSIONAL EXPERIENCE

- Dean of Engineering and the Built Environment, University of Johannesburg (01/01/2009)
- 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 Systems Group: School of Electrical and Information Engineering, University of the Witwatersrand (04/01/2003-31/12/2008)
- Executive Assistant: Technical Director: South African Breweries (01/09/2001-30/03/2003)
- Post-Doctoral Research Associate: Imperial College of Science, Technology and Medicine (University of 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:

- Rated Researcher by the NRF (P-Rating [2004-2008]; C2 [2009-Present])
- 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

¹ University of Pretoria

² University of the Witwatersrand

- 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

- Programme for Leadership Development (2006-2007), Harvard Business School, USA.
- Post-Doctoral Research Associate (2000-2001), Imperial College (University of London)
- Ph.D. Engineering (1997-2000), University of Cambridge (St. John's College), United Kingdom
- M.Eng. Mechanical Engineering (1996-1997), University of Pretoria, South Africa
- B.S. Mechanical Engineering, *Magna Cum Laude*, (1991-1995), Case Western Reserve University, USA
- Post-Matriculation Studies (1990), St. John's College, Johannesburg
- Matriculation in the top 100 in South Africa (Department of Education and Training) (1989), Mbilwi Secondary School, Venda, Limpopo Province

Member of Board of Directors/Trustees/Committees

- Chairman: Dean's Committee of Engineering Faculties of South Africa (January 2010)
- Member of South Africa's Department of Higher Education and Training Research Output Committee (02/08/2010-)
- Executive Committee Member: South African Academy of Engineering (07/2008-)
- Board Member: South African Statistics Council (01/03/2005-31/07/2008)
- Non-Executive Director, State Information Technology Agency (2005-2008)
- Board Member: South African Statistics Council (01/03/2005-31/07/2008)
- Board Member: National Advisory Council on Innovation (01/04/2005-01/01/2008)
- Board Member: Johannesburg Centre for Software Engineering (01/01/2008-31/12/2008)
- Board Member: South African National Council of Scientific Professions (01/03/2006-31/02/2007)
- Deputy Chairman: Limpopo Business Support Agency (01/01/2006-01/06/2010)
- Chairman: Local Loop Unbundling Committee (2006 to 2007)

SELECTED AWARDS, HONOURS AND ACHIEVEMENTS

- Speaker: Science and Technology in Society Forum Representative for the African Continent, Kyoto, Japan (2010)³

³ Invited speaker as a Future Leader at the forum entitled "*The Lights and Shadows of Science and Technology*," by the Science and Technology in Society (SPS) forum and The New York Academy of Sciences and sponsored by the Japan Society for the Promotion of Science nominated by Dr. Peter McGrath, Program Officer of the Third World Academy of Sciences

- Paper Co-Authored was Featured in the MIT Technology Review (2009)⁴
- TWAS-AAS-Microsoft 2009 Award for Young Scientists
- Visiting Scholar The Center for Studies in Higher Education University of California at Berkeley (November 2009)⁵
- 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)
- Technology and Human Resources for Industry Programme (THRIP) Technology Awards: Outstanding Project Leader (2007)
- Best Presentation Award: World Congress of Computational Intelligence (2006)
- 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)
- NRF Rated⁶
- 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)

⁴ <http://www.technologyreview.com/biomedicine/24051/>

⁵ The position not taken due to busy schedule

⁶ Rated P from 2004 to 2008 and C2 from 2009-2013 by the NRF

- 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 TWAS, The Academy of Sciences for the Developing World (2010)
- ACM⁷ Distinguished Scientist (ACM)⁸ (2010)
- 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)⁹
- Registered Professional Engineer (2005)
- Senior Member of the ACM¹⁰ (2009-2010)

⁷ Association for Computing Machinery

⁸ “ACM Distinguished Membership recognizes up to 10% of ACM’s top members who have had significant accomplishments or impact on the computing field”

⁹ “The Senior Member Grade recognizes those IEEE members with at least 10 years of professional experience who have demonstrated significant performance over a period of 5 years”

¹⁰ “The Senior Member Grade recognizes those ACM members with at least 10 years of professional experience and 5 years of continuous Professional Membership who have demonstrated performance that sets them apart from their peers”

Editorial Responsibilities:

- Associate Editor: International Journal of Systems Science (2007-)
- Associate Editor: Journal of Computers (2008-)
- Associate Editor: South African Journal of Science (2009-2010)
- 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-)
- Associate Editor: ICIC Express Letters, *Part B: Applications* (*An International Journal of Research and Surveys*) (2010-)
- Editorial Board: Open Aerospace Engineering Journal (2007-)
- Editorial Advisory Board: International Journal of Engineering Research in Africa (JERA) (2009-)
- Editor: International Journal of Intelligent Information Processing (2010-)

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**. (PCT/IB2009/006125) “An artificial larynx”

Books:

- B-1. **T. Marwala**. Finite Element Model Updating Using Computational Intelligence Techniques. *Springer-Verlag*, London, UK, 2010, ISBN: 978-1-84996-322-0.
- B-2. **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-3. **T. Marwala** (Ed.). Computational Intelligence for Modelling Complex Systems. *Research India Publications*, 2007, ISBN: 978-81-904362-1-2.
- B-4. 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.

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: *Multiagent 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.
- Ch-29. Bo Xing, Wen-Jing Gao, Fulufhelo V. Nelwamondo, Kimberly Battle and **Tshilidzi Marwala** Part-Machine Clustering: The Comparison between Adaptive Resonance Theory Neural Network and Ant Colony System 2010 Book Series Lecture: Notes in Electrical Engineering, ISSN 1876-1100 Volume 67, Book Advances in Neural Network Research and Applications, Publisher Springer Berlin Heidelberg. DOI 10.1007/978-3-642-12990-2 ISBN 978-3-642-12990-2 (Online), Pages 747-755 .
- Ch-30. Bo Xing, Wen-Jing Gao, Fulufhelo V. Nelwamondo, Kimberly Battle and **Tshilidzi Marwala** Two-Stage Inter-Cell Layout Design for Cellular Manufacturing by Using Ant Colony Optimization Algorithms Lecture Notes in Computer Science, Advances in Swarm Intelligence. DOI: 10.1007/978-3-642-13495-1_35, ISBN 978-3-642-13494-4, Pages 281-289
- Ch-31. Perez, M. Rubin, D.M. **Marwala**, T. Scott, L.E. Featherston, J. Stevens, W. The Fuzzy Gene Filter: An Adaptive Fuzzy Inference System for Expression Array Feature Lecture Notes in Computer Science 2010, NUMB 6098, pages 62-71 Publisher Springer-Verlag, ISSN 0302-9743

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.
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- C-97. Kiremire, Buntj B. E.; **Marwala, Tshilidzi**. Nonstationarity Detection: The Use of the Cross Correlation Integral in ECG, and EEG Profile Analysis. *IEEE Congress on Image and Signal Processing*, 2008. CISP '08. , Volume 5, 27-30 May 2008 pp. 373 - 378.
- C-98. Mistry, J.; Nelwamondo, F.V.; **Marwala, T.** Investigating a Predictive Certainty measure for Ensemble Based HIV Classification. *IEEE International Conference on Systems, Computational Cybernetics*, 2008. ICCS 2008, 27-29 Nov. 2008 pp. 231 - 236.
- C-99. **T. Marwala** and Meir Perez. Stochastic optimization approaches for solving Sudoku. *Proceedings of SAGO*, 2008, ArXiv: 0805.0697.

- C-100. T.C. Malumedzha and T. Marwala Classification of Satellite Sensed Data using Genetically Optimized Auto-Associative Cellular Neural Networks. *Intelligent Systems and Control (ISC 2008) Symposia: Computational Biology and Bioinformatics Environmental Modelling and Simulation Modern Nonlinear Theory* (2008)
- C-101. Abe, A. Jimoh and **T. Marwala**. Optimization of Radio Frequency Usage. *IEEE Africon 2009*, Digital Object Identifier 10.1109/AFRCON.2009.5308110.
- C-102. P.B. Patel and **T. Marwala**. Genetic Algorithms, Neural Networks, Fuzzy Inference System, Support Vector Machines for Call performance classification. *IEEE ICMLA 2009*, 415-420.
- C-103. M. Perez, J. Featherston, **T. Marwala**, L.E. Scott, W. Stevens, D.M. Rubin Differentially Expressed Gene Identification based on Separability Index. *IEEE ICMLA 2009*, 429-434.
- C-104. M. J. Russell, D. M. Rubin, **T. Marwala** and B. Wigdorowitz A Voting and Predictive Neural Network System for use in a New Artificial Larynx. *IEEE ICBPE 2009*, Digital Object Identifier 10.1109/ICBPE.2009.5384105.
- C-105. Gidudu, Anthony; Bolanle, Abe T.; **Marwala, Tshilidzi**; Random ensemble feature selection for land cover mapping. *Geoscience and Remote Sensing Symposium, 2009 IEEE International, IGARSS 2009, Volume: 2, Digital Object Identifier: 10.1109/IGARSS.2009.5418226, Publication Year: 2009, Page(s): II-840 - II-842*
- C-106. L. Mthembu and **T. Marwala**, M.I. Friswell and S. Adhikari. Finite Element Model Selection Using Particle Swarm Optimization. *IMAC 2009 arXiv:0910.2217*.
- C-107. Bo Xing, Fulufhelo V. Nelwamondo, Kimberly Battle, Wenjing Gao and **Tshilidzi Marwala** Application of Artificial Intelligence (AI) Methods for Designing and Analysis of Reconfigurable Cellular Manufacturing System (RCMS) 2nd IEEE International Conference on. Adaptive Science & Technology Catching Up With Technology 14-16 December 2009 - Accra, GHANA, pp. 402 - 409.
- C-108. 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*, pp. 887-894.
- C-109. Bo Xing, Wenjing Gao, Fulufhelo V. Nelwamondo, Kimberly Battle and **Tshilidzi Marwala**. Ant Colony Optimization for Automated Storage and Retrieval System. *IEEE CEC 2010*, pp. 1133-1139.
- C-110. G.G. Anderson, FV Nelwamondo and **T. Marwala**. A Response Surface Methodology Approach to Operating System Scheduler Tuning. *IEEE SMC (accepted)*
- C-111. B. Abe, A. Gidudu and **T. Marwala** Investigating the effects of ensemble classification on remotely sensed data for land cover mapping. *IEEE IGARSS (accepted)*
- C-112. C.D. Boesack, **T. Marwala** and F.V. Nelwamondo Application of GA-Fuzzy Controller Design to Automatic Generation Control. *IEEE IWACI2010*, Digital Object Identifier: 10.1109/IWACI.2010.5585127, 2010, Page(s): 227 - 232
- C-113. Bo Xing, Wen-Jing Gao, Kimberly Battle, Fulufhelo V. Nelwamondo and **Tshilidzi Marwala** Can Ant Algorithms Make Automated Guided Vehicle System More Intelligent? *IEEE SMC (accepted)*
- C-114. Bo Xing, Wen-Jing Gao, Kimberly Battle, Fulufhelo V. Nelwamondo and **Tshilidzi Marwala** Intelligent Travel Route Planning for Bridge Crane Type of Material Handling Equipment in Cellular Manufacturing. *IEEE SMC (accepted)*
- C-115. Omar F Hamad and **Tshilidzi Marwala**. Enhanced-Delivery Overlay Multicasting Scheme by Optimizing Bandwidth and Latency Discrepancy Ratios. *Proceedings of the ICCET, Amsterdam, The Netherlands, September 28-30, 2010, (accepted)*

- C-116. M. Perez, J. Featherston, **T. Marwala**, L.E. Scott, W. Stevens, D.M. A population-based incremental learning approach to microarray gene expression feature selection. IEEE 26th Convention of Electrical and Electronics Engineers, Israel (accepted).
- C-117. Mlungisi Duma, Bhakisipho Twala, **Tshilidzi Marwala** and Fulufhelo V. Nelwamondo Predicting Risk using Missing Insurance Data: A Comparison between Decision Trees and Artificial Neural Networks. The 2010 International Congress on Computer Applications and Computational Science (accepted).

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

- T-1. **T. Marwala**. Relevance of artificial intelligence in South African technology arena. In BIT Forum Supplement Enterprise May 2002. 10-11.
- T-2. **T. Marwala**. Using computers to monitor the health of structures. *Science in Africa*, Issue. 27, June 2003.
- T-3. **T. Marwala**. *Column*: Moulding leaders for 21st-century challenges. *City Press*, 24 April 2005, p. 18.
- T-4. **T. Marwala**. Condition monitoring of mechanical systems. *Electricity + Control*, January 2005, pp. 33-35.
- T-5. **T. Marwala**. The artificial beer taster. *Electricity + Control*, May 2005, pp. 22-23.
- T-6. **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-7. **T. Marwala**. *Column*: Power blackouts can be beaten. *City Press*, 5 March 2006, p. 22.
- T-8. **T. Marwala**. Local Loop Unbundling. *EngineerIT* April 2007, page. 8.
- T-9. E. Marais, **T. Marwala**. Predicting the presence of internet worms using novelty detection. *ArXiv: 0705.1288*.
- T-10. **T. Marwala**. *Column*: South Africa's economy can be revolutionised. *City Press*, 30 April 2006, pp. 22.
- T-11. **T. Marwala**. Die kragonderbrekings hou 'n paar lesse in. *Rapport* 4 March, 2006.
- T-12. **T. Marwala**. Local loop unbundling recommendations - What does it mean for an ordinary person? *EngineerIT* , p. 10, June 2007.
- T-13. **T. Marwala**. Letters: The Chinese Century. *Time Magazine*. February 2007, Vol. 169, No. 6, p. 10.
- T-14. **T. Marwala**. Building human capital in South Africa. *Acumen 3rd Quarter* 2007, pp. 22-29.
- T-15. **T. Marwala**. Letters: A South African success story. *Time Magazine*, 22 September 2008, p.8.
- T-16. **T. Marwala**. Letters: Democracy in South Africa. *Time Magazine*, 30 April 2009, p.8.
- T-17. **T. Marwala**. Letters: First amongst equals. *The Economist* 16 May 2009, p. 20.
- T-18. Baruch Lubinsky, Bakir Genc and **T. Marwala**. Dynamically Weighted Mixture of Experts for the Prediction of Platinum Prices. arXiv:0812.2785 (December 2008).
- T-19. Sarah Wright, **T. Marwala**. Artificial Intelligence Techniques for Steam Generator Modelling. 2006, arXiv:0811.1711.
- T-20. Dan Golding, Linda Wilson, **T. Marwala**. Emergency Centre Organization and Automated Triage System. 2008, arXiv:0810.3671.
- T-21. Darren Blend and **T. Marwala**. Comparison of Data Imputation Techniques and their Impact. 2008, arXiv:0812.1539.
- T-22. D. Moon and **T. Marwala**. Missing Data using Decision Forest and Computational Intelligence. 2008, arXiv:0812.1615.

- T-23. **T. Marwala.** Foundations for a Developmental State: A case for technical education, 2009, arXiv:0907.2019.
- T-24. Evan Hurwitz and **Tshilidzi Marwala** Machine Learning Techniques to Portfolio Optimisation. arXiv:0910.2276
- T-25. **T. Marwala.** Telecoms unbundling will be good for consumers. City Press 8 July 2007, pp. 22.

Theses:

- T-26. **T. Marwala.** Fault identification using neural networks and vibration data. Doctor of Philosophy Topic, *University of Cambridge*, 2001. (Supervisor: Dr. HEM Hunt)
- T-27. **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 Scurrall, 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. Dhiresk 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 Israel
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. Buntj Kiremile, 2008, M.Sc. (Electrical Engineering) – Completed. University of the Witwatersrand. Topic: Non-stationarity Detection Where last tracked? Engineer at Eskom
30. Nthabiseng Unathi Hlalele, 2009, MSc (Electrical Engineering) – Completed with Distinction. University of the Witwatersrand. Topic: The impact of missing data imputation on HIV classification Where last tracked? Engineer at the CSIR
31. Vukosi Marivate, 2009, MSc (Electrical Engineering) – Completed. University of the Witwatersrand. Topic: Investigation into the effect of social learning in reinforcement learning board game playing agents Where last tracked? PhD student at Rutgers University
32. Jaisheel Mistry, 2009, MSc (Electrical Engineering) – Completed. University of the Witwatersrand. Topic: Estimating Missing Data with Confidence Intervals Where last tracked? Where last tracked? Engineer at the CSIR
33. Lesedi Masisi, 2009, MSc (Electrical Engineering) – Completed. University of the Witwatersrand. Topic: Investigating the structural diversity within a committee of classifiers and their generalization performance. Where last tracked? Engineer at the CSIR
34. Tendani Malumedzha, 2009, MSc (Electrical Engineering) – Completed. University of the Witwatersrand. Topic: Modeling Multiple Object Scenarios for Feature Recognition and Classification Using Cellular Neural Networks Where last tracked? Engineer at the CSIR
35. Wabo Majavu, 2009, MSc (Electrical Engineering) – Completed. University of the Witwatersrand. Topic: Classification of web resident sensor resources using latent semantic indexing and ontologies Where last tracked? Consultant at Accenture

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), 2009, 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), 2010, Completed. University of the Witwatersrand. Topic: An IVR Call performance classification system using computational intelligence techniques. Where last tracked? Engineer in Johannesburg
6. Megan Jill Russell, Ph.D. (Electrical Engineering), 2010 (Submitted), Topic: Towards an innovative electronic, artificial larynx.

Other Research Students Supervised:

1. Lindokuhle Mpanza
2. W.S. Miya
3. Unathi Mahola
4. Ishmael Msiza
5. Adam Pantanowitz
6. Dabiel Golding
7. Baruch Lubinsky
8. Sarah Wright
9. Linda Wilson
10. Darren Blend
11. D. Moon

Students Currently Under Supervision:

12. Evan Hurwitz, Ph.D.
13. Linda Mthembu, Ph.D.
14. Meir Perez, Ph.D.
15. George Anderson, Ph.D.
16. Mlungisi Duma, Ph.D.
17. Bolanle Abe, Ph.D.
18. Bo Xing, D.Eng.
19. 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, 2005¹³.
- 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)

¹³ Invited by the South African Embassy in Japan

- 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) |
| • South Africa/Poland Research
Cooperation Programme | ZAR 200 000 | (2010-2012) |
| • NRF Grant: Competitive Programme
For Rated Researchers | ZAR 1291 000 | (2010-2012) |
| • NRF Grant: Competitive Programme
For Rated Researchers | ZAR 1291 000 | (2010-2012) |
| • NRF/HESA IBSA Cooperation in Higher Education
For Rated Researchers | ZAR 80 000 | (2010) |

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

External Examination

- Uttar Pradesh Technical University, Lucknow, India
 - PhD (Computer Science)
- University of Pisa, Italy
 - PhD (Computer Science)
- Rand Afrikaans University
 - Masters of Engineering (Electrical Engineering)
 - Master of Engineering (Electrical Engineering)
- University of Pretoria
 - Master of Engineering (Mechanical Engineering)
- North-West University
 - PhD in Engineering
 - Master of Engineering
- University of Cape Town
 - M.Sc. (Electrical Engineering)
 - M.Sc. (Civil Engineering)
 - M.Sc. (Physics)
- Tshwane University of Technology
 - Master of Technology (Electrical Engineering)
 - Master of Engineering (Electrical Engineering)
- University of the Witwatersrand
 - Master of Science (Electrical Engineering)
 - Master of Science (Mechanical Engineering)

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 (2008)
- Raised funds from the Carl and Emily Fuchs Foundation Ligege Secondary School – R15,000.00 (2009)
- Raised funds from the Carl and Emily Fuchs Foundation Dimani Agricultural High School – R10,000.00 (2010)

Reference:

Available upon request