

UNIVERSITY OF PRETORIA

CURRICULUM VITAE

1. BIOGRAPHICAL SKETCH

1.1 GENERAL INFORMATION									
Surname	Theron								
First names	Nicolaas Johannes			ID Number					
Citizenship	South African			Title	Prof	Female		Male	X
Place of birth	Ceres, South Africa			Date of birth			8 November 1956		
Population group	African		Coloured		Indian		White	X	Other <i>(Please specify)</i>
Department	Mechanical and Aeronautical Engineering			Position			Associate Professor		
Direct Telephone	012 420 3309			Direct Telefax					
E-mail	nico.theron@up.ac.za								
Date of appointment	1 January 2000			Permanent full-time			X	Temporary full-time	

1.2 ACADEMIC QUALIFICATIONS OBTAINED				
Degree/ Diploma	Field of study	Higher education institution	Year	Distinctions
PhD	Mechanical Engineering	Rensselaer Polytechnic Institute	1987 1994	
MEng	Mechanical Engineering	University of Stellenbosch	1983 1985	Yes
Hons-BEng (five year degree)	Mechanical Engineering	University of Stellenbosch	1975 1979	Yes

1.3 WORK EXPERIENCE TO DATE		
Name of employer	Capacity and/or type of work	Period
Department of Mechanical and Aeronautical Engineering University of Pretoria	Associate Professor	Jan 2000 – present time
Department of Mechanical Engineering University of Stellenbosch	Associate Professor	Jan 1997 – Dec 1999
Department of Mechanical Engineering University of Stellenbosch	Senior Lecturer	Jan 1995 – Dec 1996
Bureau for Mechanical Engineering, University of Stellenbosch	Initially: Assistant Engineer and later: Engineer; consulting, research and development work	Jan 1982 – Dec 1991

2. TEACHING ACTIVITIES

2.1 Courses presented		
Course	Level	Self developed
MBB 410 Control Systems	fourth year	Partially
MPR 213 Computer programming and IT	second year	Partially
MSD 210 Dynamics	second year	Partially
MEG 123 Introductory Mechanics	first year	No
MOX 410 Design	fourth year	No
MSC 412/422 Project	fourth year	No
MBB 780 Control Systems	Hons	Yes
MBB 732 Control Systems	Hons	No
MEE 732 Finite Element Methods	Hons	Partially
MEV 732 Vibration	Hons	No
MGV 732 Advanced Vehicle Engineering	Hons	Partially
Dynamics A 344 (US)	third	No
Dynamics B 414 (US)	fourth year	No
Mechatronics 414 (US)	fourth year	No
Mechanics of Machines (US)	second year	No
Mechanics of Machines (US)	third year	No
Machine Design 314 (US)	third year	No
Theory of Elasticity 844 (US)	Masters	Yes
Advanced Dynamics 824 (US)	Masters	Yes
Advanced Dynamics 834 (US)	Masters	Yes
Design for Reliability 844 (US)	Masters	No
Light Structures 714 (US)	Hons	No
Mechanical Vibrations 722 (US)	Hons	No

2.2 Other education and pedagogic courses presented		
Course	Year	Institution

3. TEACHING OUTPUTS

3.1 Educational publications and products

4. OTHER TEACHING CONTRIBUTIONS

4.1 Membership of national and international bodies

4.2 Visits to local and overseas universities as guest professor or lecturer in regard to teaching

4.3 Participation in national and international teaching associations, bodies, committees

5. POSTGRADUATE SUPERVISION

5.1 Supervision or co-supervision of students who have completed degrees

Name of student	Degree ¹ /Title of dissertation/ thesis and date completed	Supervisor	Co-supervisor(s)	Duration of studies (years)
Matadin, S	PhD (Engineering): High Agility 6 Degree Of Freedom Hybrid Serial-Parallel Kinematic Robotic Arm	Prof N.J. Theron		8
Tikam, M	MEng: Posture control of a low-cost commercially available hexapod robot for uneven terrain locomotion (Masters research), 2018	Prof N.J. Theron	Dr. Daniel J. Withey	4
Mokobodi, TS	MEng: Designing and developing a free fall absolute gravity measuring system, using pneumatic actuators (Masters research), 2017	Prof N.J. Theron	Mr GP Greeff	3

¹ Indicate whether Honours, Masters research, Masters coursework with dissertation or Doctorate

Purkis, TL	MEng: Development and validation of the pre- and post-processing algorithms for quantitative gait analysis using a prototype wearable sensor system (Masters research), 2017	Prof N.J. Theron	Ms Mariette Conning	3
Knijnenburg, GF	MEng: Development of a vibration isolation system for a rotary wing unmanned aerial vehicle (Masters research), 2017	Prof N.J. Theron		4
Freyer, B	PhD (Engineering): Active tool vibration control and tool condition monitoring using a self-sensing actuator, 2016	Prof N.J. Theron	Prof P.S. Heyns	12
Theron, HJ	MEng: Modelling and characterization of a modified 3-DoF pneumatic Gough-Stewart platform, (Masters research), 2016	Prof N.J. Theron		4
Luyt, PCB	MEng: A leak tight design methodology for large diameter flanges based on non-linear modelling and analysis, (Masters research), 2015	Prof N.J. Theron	Mr Francesco Pietra	1
Van den Bergh, J	MEng: Effects of friction and gas modelling on vehicle dynamics simulation, (Masters research), 2015	Prof N.J. Theron	Prof P.S. Els	4
Williams, E.F.	MEng: Design and Analysis of a Practical Large-Force Piezoelectric Inchworm Motor with a Novel Force Duplicator, (Masters research), 2013	Prof N.J. Theron	Dr P. Loveday (CSIR)	5
Kasanalowe Nkhoma, R.C.	MSc(Applied Sciences): Use of individual wheel steering to improve vehicle stability and disturbance rejection, (Masters research), 2010	Prof N.J. Theron		5
Agenbag, D.S.	MEng: Longitudinal Handling Characteristics of a Tailless Gull-Wing Aircraft, (Masters coursework with dissertation), 2008	Prof N.J. Theron	Mr R.J. Huysen	7
Els, P.S.	PhD (Engineering): The ride comfort vs. handling compromise for off-road vehicles, 2006	Prof N.J. Theron		9
Naude, F.P.	MEng: Development of a methodology for calculating stresses in track components (Masters coursework with dissertation), 2004	Prof N.J. Theron	Dr R.D. Fröhling (Spoornet)	5

Misselhorn, W.E.	MEng: Verification of hardware-in-the-loop as a valid testing method for suspension development (Masters coursework with dissertation), 2004	Prof N.J. Theron	Mr P.S. Els	4
Meintjes, S.W.v.d.M.	MEng: Comparative study into occupant support concepts with respect to crash response (Masters coursework with dissertation), 2004	Prof N.J. Theron	Mr R.J. Huysen	5
Cronje, J.M.	MEng: Development of a tunable vibration isolator utilising a smart actuator (Masters coursework with dissertation), 2003	Prof P.S. Heyns	Prof N.J. Theron, Dr P. Loveday (CSIR)	3
Spoelstra, M.L. (University of Stellenbosch)	MScEng: Aeroelastic optimization of a reinforced ram-air inflated wing (Masters coursework with dissertation), 1999	Prof N.J. Theron		unknown
Aggenbach, W.A. (University of Stellenbosch)	MEng: Ontwerp van 'n Generiese Fladdermodel (Masters coursework with dissertation), 1991	Prof N.J. Theron		unknown

5.2 Current post-graduate students

Name of student	Degree ² enrolled for and date of first registration	Project title	Supervisor	Co-supervisor(s)	Year of registration
Meeser, RF	PhD, 2016	Optimization of control strategies to maximise operating efficiency for use in a hybrid underground locomotive over various rail conditions	Prof N.J. Theron	Prof X Xia	

6. RESEARCH FUNDING

6.1 Obtaining research funds

Origin of research funds	Title of research project or programme	Duration	Money allocated (R)
Advanced Manufacturing Technology Strategy, Department of Trade and Industry	Affordable Automation Flagship Programme: conceptual design of a reconfigurable manufacturing system	July 2007 – June 2008	180 000

² Indicate whether Honours, Masters research, Masters coursework with dissertation or Doctorate

US Army European Research Office	Controllable Wheeled Vehicle Suspension Research — Phase 2 (with Mr PS Els)	Oct 2002 – Sep 2003	311 000
US Army European Research Office	Controllable Wheeled Vehicle Suspension Research (with Mr PS Els)	July 2001 – June 2002	350 000
ARMSCOR	Development of a flexbeam hub for RTF	1998/99	55 960
ARMSCOR	Feasibility study on a flexbeam hub for the Rooivalk helicopter and study on the design criteria and load envelope for a Rooivalk flexbeam hub (with others)	1996/97	30 000

7. RESEARCH OUTPUTS

7.1 Publications in peer-reviewed or refereed journals

Mokobodi, T., Greeff, P., Kruger, O. and Theron, N.J., “Free-fall gravitational acceleration measurement using a pneumatically controlled catch-and-release-system in a semi-rotating vacuum chamber”. *Metrology and Measurement Systems*, Vol. 25, pp. 689-699, 2018.

Luyt, P.C.B., Theron, N.J. and Pietra, F.; “Non-linear finite element modelling and analysis of the effect of gasket creep-relaxation on circular bolted flange connections”, *International Journal of Pressure Vessels and Piping*, Vol 150, pp. 52-61, 2017.

Abou-El-Hossein, K., Theron, N.J. and Ghobashy, S.; “Design of Machine Tool Based on Reconfigurability Principles”, *Applied Mechanics and Material*, Vols. 789-790, pp. 211-217, 2015.

Freyer, B.H., Heyns, P.S. and Theron, N.J.; “Comparing orthogonal force and unidirectional strain component processing for tool condition monitoring”, *Journal of Intelligent Manufacturing*; Vol 25, pp. 473-487, 2014.

Oke, A.O., Abou-El-Hossein, K. and Theron, N.J., “The design and development of a reconfigurable manufacturing system.” *South African Journal of Industrial Engineering*, Vol 22 (2), pp. 121-132, 2011.

Pal, S, Heyns, P.S., Freyer, B.H., Theron, N.J. and Pal, S.K., “Tool wear monitoring and selection of optimum cutting conditions with progressive tool wear effect and input uncertainties.” *Journal of Intelligent Manufacturing*; Vol 22, pp. 491-504, 2011.

Oke, A.O., Abou-El-Hossein, K. and Theron, N.J., “Reconfigurability approach in manufacture of moulds and dies.” *Advanced Materials Research* Vols. 264-265, pp. 1708-1713, 2011.

Agenbag, D.S., Theron, N.J. and Huyssen, R.J.; “Pitch Handling Qualities Investigation of the Tailless Gull-Wing Configuration”, *Journal of Aircraft* Vol 46, No.2, pp. 683-691, 2009.

Freyer, B.H., Theron, N.J. and Heyns, P.S.; “Simulation of tool vibration control in turning, using a self-sensing actuator”, *Journal of Vibration and Control* Vol 14, No 7, pp. 999-1019, 2008.

Els, P.S., Theron, N.J., Uys, P.E. and Thoresson, M.J.; “The ride comfort vs. handling compromise for off-road vehicles”, *Journal of Terramechanics* Vol. 44, pp. 303-317, 2007.

Theron, N.J. and Els, P.S. “Modelling of a semi-active hydropneumatic spring–damper unit”, *International Journal of Vehicle Design*, Vol. 45, No. 4, pp.501–521, 2007.

Misselhorn, W.E., Theron, N.J. and Els, P.S.; “Investigation of hardware-in-the-Loop for use in suspension development”, *Vehicle System Dynamics*, Vol. 44, No. 1, pp. 65-81, 2006.

Naudé, F.P., Fröhling, R.D. and Theron, N.J.; “Development of a methodology to calculate stresses in track components”, *Journal of Rail & Rapid Transit* (i.e., *Proceedings of the Institution of Mechanical Engineers Part F*), Vol 219, pp. 213-224, 2005.

Cronje, J.M., Heyns, P.S., Theron, N.J. and Loveday, P.; “Development of a variable stiffness and damping tunable vibration isolator”, *Journal of Vibration and Control*, Vol. 11, pp. 381-396, 2005.

Groenwold, A.A.; Xiao, Q.Z.; and Theron, N.J.; "Accurate solution of traction free boundaries using hybrid stress membrane elements with drilling degrees of freedom", *Computers and Structures*, Vol 82 pp. 2071–2081, 2004.

Meintjes, S.W.v.d.M.; Huysen, R.J. and Theron, N.J.; "Comparison of Crash Response with Different Occupant Support Concepts", *Aircraft Engineering and Aerospace Technology*, Vol. 76, No. 4, pp. 366-375, 2004.

Bauchau, O.A. and Theron, N.J.; "Energy Decaying Scheme for Nonlinear Elastic Multi-body Systems". *Computers and Structures*, Vol. 59, No. 2, pp. 317-331, 1996.

Bauchau, O.A. and Theron, N.J.; "Energy Decaying Scheme for Nonlinear Beam models". *Computer Methods in Applied Mechanics and Engineering*, Vol. 134, pp. 37-56, 1996.

Bauchau, O.A., Damilano, G. and Theron, N.J.; "Numerical Integration of Non-Linear Elastic Multi-Body Systems". *International Journal for Numerical Methods in Engineering*, Vol. 38, pp. 2727-2751, 1995.

Laulusa, A., Bauchau O.A. and Theron N.J., "Theoretical and experimental investigation of the nonlinear behavior of composite beams". *La Recherche Aéronautique* (later *Aerospace Science and Technology*), Vol. 4, pp. 223-240, 1995.

7.2 Papers accepted for publication in peer-reviewed or refereed journals

Freyer, B.H., Theron, N.J., Heyns, P.S. and Pickelmann, L.A.; "Self-sensing active control of emulated tangential tool vibration hardware-in-the-loop". *Control Engineering Practice*

7.3 Papers submitted to peer-reviewed or refereed journals

7.4 Books and/or chapters in books

7.5 Published full-length conference papers/keynote addresses

Tikam, M, Withey, D and Theron, N.J.; "Posture Control for a Low-Cost Commercially-Available Hexapod Robot", IEEE International Conference on Robotics and Automation (ICRA), 31 May to 31 August, 2020. Paris, France

Tikam, M, Withey, D and Theron, N.J.; "Standing Posture Control for a Low-Cost Commercially Available Hexapod Robot", IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 24 to 28 September 2017, Vancouver, Canada

Williams, E., Loveday, P. and Theron, N.; "Design of a large-force piezoelectric Inchworm motor with a force duplicator", 6th Robotics and Mechatronics Conference (RobMech 2013), Durban, South Africa, 30 to 31 Oct 2013.

Faure, D., Theron, N.J. and Els, P.S.; "Vehicle rollover prevention using rear wheel steering control", 12th European Regional Conference of the International Society of Terrain Vehicle Systems (ISTVS), Pretoria, SA, 24 to 28 Sept 2012.

Oke, A.O., Abou-El-Hossein, K. and Theron, N.J., "Process Planning for Reconfigurable Manufacturing System for Mould/Die Making." 4th Robotics and Mechatronics Conference (RobMech 2011), Pretoria, South Africa, 23–25 Nov 2011.

Oke, A.O.; Abou-El-Hossein, K., Theron, N.J. and Adetan, D.A., "Simulation of reconfigurable manufacturing system using Delmia/Quest software", International Conference on Innovations in Engineering and Technology (IET 2011), Lagos, Nigeria, 8-10 Aug 2011.

Oke, A.O.; Abou-El-Hossein, K. and Theron, N.J.; "Development of reconfigurable manufacturing system using flowline configuration", 26th International Conference of CAD/CAM, Robotics & Factories of the Future, Kuala Lumpur, Malaysia, 26-28 July 2011.

Oke, A.O.; Abou-El-Hossein, K. and Theron, N.J.; "Group Technology for Reconfigurable Manufacturing of Moulds and Dies", 25th International Conference of CAD/CAM, Robotics & Factories of the Future, Pretoria, South Africa, 13-16 July 2010.

Oke, A.O., Abou-El-Hossein, K. and Theron, N.J.; "Approach to Solving Group Technology (GT) Problem to Enhance Future Reconfiguration of Manufacturing Systems" International Conference on Competitive Manufacturing (COMA 2010), Stellenbosch, South Africa, 3-5 Feb 2010.

Oke, A.O., Abou-El-Hossein, K., Gorchach, I. and Theron, N.J., "Reconfigurability approach in manufacture of moulds and dies", The international conference on advances in materials and processing technologies AMPT 2009, Kuala Lumpur, Malaysia, 26-29 October 2009.

Els, S. and Theron, N., "The Four-State Semi-Active Suspension System (4S₄)", 11th European Regional Conference of the International Society for Terrain-Vehicle Systems (ISTVS), Bremen, Germany, 5-8 October 2009.

Abou-El-Hossein, K. and Theron, N.J., "Design of machine-tool based on reconfigurability principles", The international conference on advances in materials and processing technologies AMPT 2008, Bahrain 2008.

Freyer, B.H., uk Wang, S., Theron, N.J. & Heyns, P.S.; "Simulated active control of tool vibrations and simultaneous tool condition monitoring". Condition Monitoring 2005, Cambridge, United Kingdom, 18-21 July 2005, pp. 127 – 132.

Cronjé, J.M., Heyns, P.S., Theron N.J. & Loveday, P.L.; "Development of a variable stiffness spring for adaptive vibration isolators". Proc. SPIE Vol. 5386, p. 33-40, Smart Structures and Materials 2004: Damping and Isolation; Kon-Well Wang; Ed. Publication date: Jul 2004

Cronjé, J.M., Heyns, P.S., Theron, N.J. & Loveday, P.L.; "Development of a tunable vibration isolator utilising a smart actuator". Fourth South African Conference on Applied Mechanics SACAM'04, Johannesburg, 18-21 January 2004, Paper No 3.

Theron, N.J. and Els, P.S.; "Modelling of a semi-active hydropneumatic spring-damper system", 9th European Conference of the International Society of Terrain Vehicle Systems (ISTVS), Harper Adams, UK, 8 to 11 Sept 2003, pages 504-515.

Groenwold, A.A. and Theron, N.J.; "Equilibrated membrane finite elements with drilling degrees of freedom". Proc. Second International Conference on Applied Mechanics and Materials, editors Adali, S; Morozov, EV and Verijenko, VE, Durban, South Africa, January 2003, pages 7-12.

Groenwold, A.A.; Xiao, Q.Z. and Theron, N.J.; "Representing traction free boundaries using drilling degrees of freedom", paper 22, Sixth International Conference on Computational Structures Technology, Prague, Czech Republic, September 2002.

Bauchau, O.A.; Lee, M. and Theron, N.J.; "Energy Decaying Scheme with Adaptive Time Step Methodology for Nonlinear Beam Models", AIAA/ASME/ASCE/AHS/ ASC 36th Structures, Structural Dynamics, and Materials Conference, New Orleans, Louisiana, USA, April 1995.

Bauchau, O.A.; Lee, M. and Theron, N.J.; "Dynamic Analysis of Nonlinear Elastic Multi-Body Systems using Energy Decaying Schemes", AIAA/ASME/ASCE/AHS/ ASC 36th Structures, Structural Dynamics, and Materials Conference, New Orleans, Louisiana, USA, April 1995.

Theron, N.J. and Müller, J.J.; "A Modal Method to model Differential Warping in Beams", 1st South African Conference on Applied Mechanics SACAM'96, Midrand, Gauteng, July 1996.

Bauchau, O.A. and Theron, N.J.; "Application of a Finite Element based Modal Method to perform Helicopter Aeroelastic Analyses", 2nd Conference on Aeronautical Engineering in South Africa, organised by the SA Institute for Aeronautical Engineering, CSIR, Pretoria, May 1990.

Theron, N.J.; du Preez, R.J. and Van Wyk, J.; "The Simulation of a Rigid Body Multi-Axle Road Vehicle with the aid of a Matrix Method", FEMSA 84 Symposium (Finite Element Methods in South Africa), CSIR, Pretoria, January 1984.

7.6 Non-refereed publications or popular articles

7.7 Patents

7.8 Technical reports

(Only reports since 1995 are listed.)

Theron, N.J.; "Alignment of robotic arm and rate table for the motion simulation facility at DPSS, CSIR — Phase 1", prepared for the CSIR - DPSS, — Business Enterprises University of Pretoria, September 2012.

Theron, N.J.; "Vibration measurements at Nestlé Infant Formula – Dry Mix Plant, Harrismith", prepared for Nestlé (South Africa) (Pty) Ltd, — Business Enterprises University of Pretoria, September 2008.

Theron, N.J. and Hugo, D., "Track B2 – Noise Controls: Phase 1 – Future Technologies", prepared for Safety in Mines Advisory Committee of South Africa, — Business Enterprises University of Pretoria, April 2008.

Heukelman, H. and Theron, N.J., "Ultrasonic Rock Drilling", prepared for CSIR Natural Resources and the Environment, — Business Enterprises University of Pretoria, October 2007.

Theron, N.J. and van Tonder, F.; "JOY Loadcell design report", prepared for Gerotek (Pty) Ltd, — Business Enterprises University of Pretoria, February 2007.

Theron, N.J., Windell, F. and Mokhafela, J.; "Vibration measurements on Desalinate Water Evaporator at Sasol Secunda Plant", report prepared for BKS Advantech (Pty) Ltd, — Business Enterprises University of Pretoria, October 2005.

Theron, N.J. and van Wyk, J.J.; "Caravan Chassis: Design Evaluation and Concept Design", report prepared for Jurgens Ci (Pty) Ltd — Cadet Technology CC, March 2003.

Theron, N.J. and Els, P.S.; "Controllable Wheeled Suspension Research", final technical report for first year of funding, prepared for the European Research Office of the US Army, August 2002.

Theron, N.J.; "Vibration measurements on the engines of the M V Alexanderturm", report prepared for IMS Engineering (Pty) Ltd — Institute for Thermodynamics and Mechanics, University of Stellenbosch, June 1998.

Theron, N.J.; "Vibration measurement on a Caterpillar V8 engine and Twin Disc marine gear-box", report prepared for Barlows Equipment Co. — Institute for Thermodynamics and Mechanics, University of Stellenbosch, December 1997.

Theron, N.J.; "Report on the Mtamvuna River Bridge Vibration Measurements", prepared for SNA Civil and Development Engineering, Inc. — Institute for Thermodynamics and Mechanics, University of Stellenbosch, June 1997.

Theron, N.J.; "KT470826 and 7. Item 33. HOOVER 1B. Feasibility study of various flexbeam hub concepts with final recommendation", prepared for ARMSCOR — Institute for Thermodynamics and Mechanics, University of Stellenbosch, March 1997.

Theron, N.J.; "Investigation into Main Gearbox Wear Problem of the Rooivalk Attack Helicopter", two reports prepared for Denel Aviation — NJ Theron Consultants CC, Milestone 1 Report: December 1996, Milestone 2 Report: January 1997

Theron, N.J.; "Torsional Vibration Measurements on a Detroit Diesel 12V-71TA engine", prepared for Peninsula Power Products, A Division of Peninsula Industries (Pty) Ltd — Institute for Thermodynamics and Mechanics, University of Stellenbosch, March 1996.

8. OTHER SCHOLARLY RESEARCH-BASED CONTRIBUTIONS

8.1 Participation in conferences, workshops and short courses - specify type of contribution

8.1.1 National

Mosikare, O., Theron, N., van der Molen, W.; "Measurements of Boat Motion in Waves at Durban Harbour for Qualitative Validation of Motion Model", 55th Annual Conference of the South African Institute of Physics, Pretoria, October 2010 (poster)

Theron, N.J.; Freyer, B.H. and Heyns, P.S.; "Using a self-sensing actuator in active tool vibration control during turning", 1st Robotics and Mechatronics Symposium, CSIR, Pretoria, South Africa, 12 November 2007 (presentation).

8.1.2 International

Cronjé, J.M.; Heyns, P.S.; Theron, N.J. and Loveday, P.; "Variable stiffness tunable vibration isolator", 2nd International Workshop on Damping Technologies, Stellenbosch, South Africa, March 2003 (presentation).

Els, P.S. and Theron, N.J.; "The Semi-Active Hydropneumatic Spring-Damper System", 2nd International Workshop on Damping Technologies, Stellenbosch, South Africa, March 2003 (presentation).

Misselhorn, W.E.; Els, P.S. and Theron, N.J.; "Hardware-in-the-Loop as a Valid Testing Method for Damper Development", 2nd International Workshop on Damping Technologies, Stellenbosch, South Africa, March 2003 (presentation).

Served as panelist at the 1st International Workshop on Damping Technologies, Ulm, Germany, June 2001.

8.2 Teamwork and collaboration with others:

Other researchers (national and international)

Representing the University of Pretoria in a consortium of three universities and the CSIR, established in 2007 by the Advanced Manufacturing Technology Strategy (now part of the Technology Innovation Agency, TIA) of the Department of Science and Technology for the purpose of developing reconfigurable manufacturing systems in South Africa.

Collaborates with Prof PS Els on an ARMSCOR funded research project on vehicle dynamics, since 2010.

Worked in a research team with colleagues Dr P.E. Uys and then Mr P.S. Els and students on the US Army European Research Office project on Controllable Wheeled Vehicle Suspension, early 2000-s.

Worked in a research team with colleague Prof P.S. Heyns, Dr P. Loveday of the CSIR and student Mr J. Cronje on the development of a tunable vibration isolator utilising a smart actuator.

8.3 Membership in national and international bodies

South African Institution of Mechanical Engineering: Member, no. 200410; since 23 March 1995.

8.4 Visits to local and overseas universities or research institutes as guest professor or researcher

9. ARTISTIC OUTPUTS

10. MANAGEMENT AND ADMINISTRATIVE DUTIES

Member of the management committee of the UP Department of Mechanical and Aeronautical Engineering, responsible for postgraduate studies (2005 to 2020).

Member of the UP School of Engineering Mathematics Committee (2004 to 2017) and Physics Committee (2007 to 2008).

Member of the management team of the Department of Mechanical Engineering of the University of Stellenbosch, as Head of its Solid Mechanics Division, and managed this division, with responsibility for four other engineering lecturers and a technician, for four years (1996 – 1999).

Member of the management committee of the Bureau for Mechanical Engineering of the University of Stellenbosch, as its Group Manager: Helicopter Engineering, and managed this group, with responsibility for four engineers, for three and a half years (mid 1988 – 1991).

Served two one-year terms as member of the management committee of the Institute for Thermodynamics and Mechanics of the University of Stellenbosch. Also served from 1 August until 31 December 1999 as the Director of this Institute.

11. COMMUNITY SERVICE OR PROFESSIONAL SKILLS

11.1 Outreach projects

11.2 Professional service performed

Contract research for US Army: “Controllable Wheeled Vehicle Suspension Research”, phase 1 and 2, with then Mr PS Els and others, US\$41 500 per year for 2002 and 2003, principal investigator 2002 (also listed under section 6.1 above).

The work leading to the reports cited in section 7.8 above.

11.3 Clinical service

11.4 Involvement with other universities/scientific institutions

Act as one of two external reviewers of the MSc in Mechanical Engineering Programme offered by the Department of Mechanical Engineering of the University of Botswana, Gaborone, Botswana, March 2019

External examiner for the Department of Mechanical Engineering, University of Zimbabwe, 2013-14, 2014-15 and 2015-16.

External examiner for module MECN249 Applied Mechanics B, offered by the School of Mechanical, Industrial and Aeronautical Engineering, University of the Witwatersrand, 2006 and 2007, and MECN2007/2013 Applied Mechanics B, offered by the same School, 2008 to 2014.

External examiner for module MECN468 Mechatronics II, offered by the School of Mechanical, Industrial and Aeronautical Engineering, University of the Witwatersrand, 2002 to 2007, MECN4012 Mechatronics II (2008) and MECN4018 Mechatronics II (2010 and 2011), offered by the same School.

External examiner for module Mechanics of Machines TMB441, offered by the Department of Mechanical, Chemical and Industrial Engineering, Wits Technikon, 2001, 2002 & 2003.

External examiner for the post graduate module AMU503Z Finite Element Analysis, offered by the Department of Mechanical Engineering, University of Cape Town, Dec 1999.

External examiner for various final year design projects and final year research projects for the School of Mechanical, Industrial and Aeronautical Engineering, University of the Witwatersrand, each year from Nov 2001 to Nov 2007.

External examiner for a number of final year research projects for the Department of Mechatronics, Nelson Mandela Metropolitan University, Nov 2009, 2011, 2012, 2013 & 2016.

Served, from March 1996 until March 2000, as the editor of the R & D Journal, that is the research and development journal of the South African Institution of Mechanical Engineering, a refereed accredited journal.

Served as the Judge for the Northern Gauteng Region of the Technology Olympiad, organized by the South African Institution of Mechanical Engineering, 2001.

Served as a panel member for appraisal of funding proposals submitted to the NRF's Thuthuka Programme, in the Earth Sciences and Engineering Cluster, October 2002, October 2003 and November 2004, and for the Engineering, Physics and Mathematical Sciences, November 2005. Served in a similar capacity in the Engineering Advisory Panel of the NRF's Institutional Capacity Development program, October 2006, in the Advisory Panel for Engineering Sciences of the NRF's Focus Area Programmes, September 2007, in the panel for the Research Infrastructure Support Programmes Grants, for the National Nanotechnology Equipment Programme, February 2010 and October 2010, for the National Equipment Programme (Physics, Chemistry and Engineering), October 2010 and March 2013, for the Strategic Research Infrastructure Grants, March 2011 and in the Engineering and ICT panel for the Competitive Programme for Rated Researchers, the Competitive Programme for Unrated Researchers and the Research Development Grant for Y-Rated Researchers, October 2016.

Served as reviewer for two applications for funding from the NRF in 2002, one in 2003, one in 2005 and one in 2009, and for two rating applications, one in 2013 and one in 2014.

11.5 Referee duties

External examiner for MEng thesis "Experimental Investigation of a Gimbal in the Frequency Domain", candidate Christian Haller, Stellenbosch University, October 2018.

External examiner for MEng thesis "Ultra-high precision grinding of BK7 glass", candidate GR Onwuka, Nelson Mandela Metropolitan University, February 2016.

External examiner for MEng thesis "Integration of an electrical discharge machining module onto a reconfigurable machine tool", candidate BH Roberts, Nelson Mandela Metropolitan University, February 2014.

Internal examiner for MEng thesis “Slow Active Suspension Control for Rollover Prevention”, candidate Sarel Francois van der Westhuizen, University of Pretoria, January 2013.

External examiner for PhD thesis “Multi-path planning and multi-body constrained attitude control”, candidate Innocent Okoloko, Stellenbosch University, July 2012.

External examiner for MEng thesis “Tool wear monitoring system using acoustic emission”, candidate O Olufayo, Nelson Mandela Metropolitan University, February 2012.

External examiner for PhD thesis “Performance enhancing elements for an 18m class glider”, candidate AS Jonker, North West University, September 2011.

External examiner for MEng thesis “Vision-guided tracking of complex three-dimensional seams for robotic gas metal arc welding”, candidate M.M.O. Hamed, Nelson Mandela Metropolitan University, February 2011.

External examiner for MScEng thesis “Helicopter tail boom vibration analysis and suppression”, candidate M.E. Funnell, University of Stellenbosch, March 2002.

Internal examiner for MEng thesis “The development of a dynamic engine testing facility”, candidate P. Conradie, University of Stellenbosch, Dec 2001.

Internal examiner for PhD dissertation “Biaxial Yield Locus Determination with a single Cruciform Specimen”, candidate E. Terblanche, University of Stellenbosch, Dec 2000.

Internal examiner for MEng thesis “Modelling of Dragline Dynamics”, candidate P.G. Crous, University of Stellenbosch, Dec 1999.

Reviewed four journal papers for the International Journal of Vehicle Design (one in 2004, two in 2009 and one in 2010), three for the R&D Journal (in 2005, 2006 and 2016), two for the SA Journal of Industrial Engineering (in 2001 and 2005) and the Journal of Terramechanics (in 2009 and 2010), and one each for the Transactions of the SAIEE (in 2004), for the International Journal of Vehicle System Modeling and Testing (in 2006), for Control Engineering Practice (in 2007), for Advances in Acoustics and Vibration (in 2016) and for Shock and Vibration (in 2018).

Reviewed five papers for the Seventh South African Conference on Computational and Applied Mechanics (SACAM10), 10-13 January 2010, and three papers for the proceedings of SACAM10, September 2010.

12. AWARDS AND SCIENTIFIC/SCHOLARLY RECOGNITION

12.1 Evaluation status as scientist/scholar

12.2 Research awards and prizes

12.3 Teaching awards and prizes

12.4 Artistic awards and prizes

12.5 Professional registration

Registered, with the Engineering Council of South Africa, as a professional engineer (No 20020088)