

CURRICULUM VITAE – FEB 2018

NAWAZ MAHOMED, BSc Eng (UCT), MSc Eng (UCT), PhD (Polish Academy of Sciences)

PERSONAL INFORMATION

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Nationality: South African
Place of birth: Cape Town, South Africa
Date of birth: 01/01/1963
Identity number: 6301015158088 (South African)

ACADEMIC QUALIFICATIONS

QUALIFICATION	INSTITUTION	YEAR
BSc Engineering (Mech)	University of Cape Town	1984
MSc Engineering	University of Cape Town Thesis: Finite Element Analysis of Groundwater Contamination.	1990
PhD (Computational Mechanics)	Institute for Fundamental Technological Research, Polish Academy of Sciences Thesis: Computational Simulation of Injection Mould Filling with a New Treatment of Free Surfaces. Supervisor: Prof Michal Kleiber	1998

WORK EXPERIENCE

- 2015/07 – Present **Associate Professor: Mechanical Engineering, Stellenbosch University**
- Research Leader: Solidification of Metal Alloys (Metal Casting)
 - Industrial collaboration projects: Shanghai Electric Company, China Valves Technology, Koeberg (Eskom).
 - Participant: Erasmus-Mundus KA2 – DAMOC (Smart Grid Technology)
 - Participant: DAAD – Project AIR (Academic Initiative on Renewables)
 - Research cooperation: China Academy of Manufacturing (CAM), Weifang.
 - Teaching modules: Machine Design (UG), Renewable Energy Systems (PG)
- 2010/05 – 2015/06 **Dean: Engineering, Cape Peninsula University of Technology**
- Strategic leadership
 - Development of key initiatives along National and regional priorities
 - Modernisation of curricula
 - Development of strategic international and National academic partnerships, including Africa, for education and research
 - General Dean’s duties – management of 8 departments, approx 300 staff
 - 30% academic component – postgraduate teaching and research

Highlights:

- Development of the Product Lifecycle Management Competency Centre in cooperation with Dassault Systemes and the French Ministry of Education and Research.
- Development of cooperation programmes with Shanghai Dian Ji University, AGH University of Science and Technology (Krakow), Rzeszow University of Technology, Universiti Teknologi Malaysia.
- Participation in the EU-funded Tuning Africa Project (Mechanical Engineering curriculum development).
- Co-initiated an EduLink (EU-funded) project to develop a Masters programme in Energy Access and Efficiency in cooperation with Wismar University (Germany).
- Establishment of the first South African Renewable Energy Technology Centre at CPUT.
- Initiated the development of the first degree programme in Petroleum Engineering in South Africa, in cooperation with SAOGA, Universiti Teknologi Petronas and Shell.

2009/08 – 2010/03

Senior Executive Manager: Institute for Maritime Technology, ARMSCOR

- Strategic positioning as a Research & Technology organisation
- Leadership in organisational development and human capital development
- Development of innovation and business partnerships – academic and industry (Defence, Oil & Gas, Shipping, Ports, etc)
- Technology commercialisation
- Oversight on quality standards (IMT is an ISO9001 accredited organisation)
- Operational compliance in accordance with internal and external regulatory requirements.

2004/06 – 2009/07

Director: Local Innovation and Manufacturing, Department of Science & Technology (DST)

- Advanced Manufacturing Technology Strategy (AMTS) of South Africa: Strategic management and development. Development of cooperation networks in Advanced Manufacturing.
 - Strategic management of the National Nuclear Manufacturing Centre at NECSA, in support of nuclear power station manufacturing capability in South Africa.
 - Competitive Supplier Development Programme: management and development of DST's participation in Government's manufacturing localisation programmes linked to procurement by state-owned enterprises Eskom, Transnet and PBMR.
 - Centres of Competence Programme: Development of Centres of Competence in technologies linked to areas of strategic economic potential.
 - Development of new initiatives under the Institutes for Advanced Tooling – industrial clusters, international cooperation, etc.
 - DST's Local Innovation Strategy: Strategic management and development of regional and sectoral innovation systems in partnership with provincial governments, selected municipal (local) governments and industry sectors – aimed at initiating and implementing innovation programmes and initiatives which include Science Parks and Centres of Competence/Expertise.
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Highlights of tenure at DST:

- Conceptualisation and establishment of the three Institutes for Advanced Tooling at Tshwane University of Technology, University of Stellenbosch and Walter Sisulu University of Technology.
- Establishment of the cooperation programme (under the SA India Bilateral Agreement on S&T Cooperation) with the Indo-German Tool Room in Aurangabad for the training of SA graduate engineers in toolmaking.
- Development of the Post Harvest Innovation Programme implemented by the Agricultural Research Council and the Fresh Produce Exporters' Forum.
- Facilitation of the cooperation between Fraunhofer Institute for Forming Technologies and an SA consortium on High Performance Machining of Titanium.
- Facilitation of the cooperation between Airbus and a SA consortium on Natural Fibre-Reinforced Composites.
- Development of the DST Technology Localisation Plan funded through the EU Sector Budget Support Programme.

2002/06 – 2004/05

Portfolio Manager, Materials Science and Manufacturing, CSIR

- Development and management of the National Tooling Initiative.
- Research on and development of Dye-Sensitised Solar Cell technology.
- Strategic assignments for Department of Science and Technology on advanced manufacturing.

2002/02 – 2002/06

Development Engineer, Gun Propulsion, DENEL Somchem

- Optimisation of propellant grain extrusion dies – computational modeling.

2001/01 – 2001/09

Chief Director: Research and Development, Central University of Technology, Free State

2000/02 – 2000/12

Consulting Engineer, Product Development, iCE Group (Pty) Ltd

1999/07 – 2000/01

Head of Research, Faculty of Engineering, Cape Peninsula Univ. of Tech.

1997/06 – 1997/12

Research Fellow, Institute for Fundamental Technological Research, Polish Academy of Sciences.

1997/01 – 1999/06

Head of Department: Mechanical Engineering, Cape Peninsula Univ. of Tech.

1995/06 – 1995/08

Visiting researcher, Laboratory for Computer Aided Engineering, University of Maribor, Slovenia.

1995/01 – 1999/12

Head, Centre for Research in Applied Technology, Cape Peninsula Univ. of Technology.

- 1991/01 – 1994/12 **Research Officer, Centre for Research in Computational and Applied Mechanics, University of Cape Town.**
- Research in Polymer Engineering (towards PhD).
 - Lectured in Applied Mechanics I (postgraduate course).
- 1985/01 – 1990/12 **Lecturer/Senior Lecturer in Mathematics and Mechanics, Cape Peninsula University of Technology**

Other relevant positions held:

- Secretary: South African Association for Theoretical and Applied Mechanics (SAAM), SA adhering body to IUTAM, a member of the International Congress of Scientific Unions (1996 - 2006).
- Representative of the Department (Ministry) of Science and Technology on the Board of Productivity South Africa (2006 – 2009).
- National Research Foundation panel member for the evaluation of research applications in the field of Discrete Manufacturing and Control Systems (2004 – 2005).
- DST Review Panel member for the Advanced Manufacturing Technology Strategy Implementation Unit – 2006.
- Member of the Project Funding Committee of the Advanced Manufacturing Technology Strategy (2008 – 2009).
- Member of the Steering Committee of the South African Continental Shelf Claim Project (2005 – 2009).
- Member of the Project Management Unit for the Institutes of Advanced Tooling (IATs) (2006 – 2008).
- Member of the Project Management Unit for the Post Harvest and Cold Chain Innovation Programme (2007 – 2009).
- Member of the Technical Advisory Committee for the National Nuclear Manufacturing Centre (2008 – 2009).
- Member of the review panel for the National Research Foundation’s South African Research Chairs Initiative (2013).
- Technical Expert: Advanced Manufacturing for the evaluation of R&D Tax Incentive applications to the Department (Ministry) of Science and Technology (2013 – 2014).
- Member of the Department (Ministry) of Science and Technology Steering Committee for the review of the Advanced Manufacturing Technology Strategy (2014).
- Visiting Lecturer, Shanghai Dian Ji University, Shanghai (2014, 2015, 2016, 2017).

RESEARCH EXPERIENCE

R&D Project Management / Leadership

- Project Leader: Solidification of Alloys, NRF-funded, 2017 – 2019.
- Project Leader: Foundry Technology Programme, DST-funded under the Technology Localisation Plan for the period 2011 – 2016. (Modelling and simulation of metal casting processes. Mechanics of Solidification. Thermal Barrier Coatings.)
- Project Team Member: Biodegradable Packaging for Fresh Fruit Exports, CPUT - funded under the AMTS (TIA) for the period 2009-2012. (Airflow optimisation in containerised packaging; modelling & simulation of high viscous flows (material characterization of ne biodegradable polymer) for injection moulding of biodegradable crates.)

- Project Leader: Nano-Scale Mechanics. CSIR project in collaboration with the Polish Academy of Sciences, and funded by Polish SA Agreement on S&T for the period 2002-2004. (Area of Research: Finite Element Modelling of Lattice Behaviour in Nanofilms (Epitaxial Layers), using Anisotropic Hyperelastic constitutive model.)
- Project Leader: Development of Dye-Sensitised Nanocrystalline TiO₂ Solar Cell. Project funded by the CSIR for the period 2002-2004.
- Previous research projects in Manufacturing-related areas whilst at CPUT between 1996 and 1999, funded by the National Research Foundation.

International Conferences (peer reviewed)

- Cupido L.H. and Mahomed N., Experimental and Numerical Investigation of Solute Transport during Solidification and Heat Treatment of AK64-type Al-Si-Cu Cast Alloy, AFSA International Aluminium Conference, Cape Town, South Africa, March 2016.
- Rzyankina E., Pytel M., Mahomed N., and Nowotnik A., Solution Heat Treatment of Single Crystal Castings of CMSX-4 Nickel-base Superalloy, Proceedings of the International Conference on Competitive Manufacturing (COMA'16), ISBN: 978-0-7972-1602-0, pp 307-312, Stellenbosch, South Africa, January 2016.
- Mahomed N., Industrial Centres of Competence – a South African Case Study, 14th International Entrepreneurship Forum (IEF) Conference, Cape Town, September 2015.
- Dłużewski P., Mahomed N. and Jurczak G., Finite Element Modelling of Lattice Behaviour in Nanofilms based on Anisotropic Hyperelasticity, 4th SA Conference on Applied Mechanics, Johannesburg, January 2004.
- Mahomed N. and Kleiber M., An Implicit Method for the Solution of Free Surfaces for Transient Stokes Flow, *Proceedings of ECCOMAS 2000*, Barcelona, 2000.
- Mahomed N., An Implicit Method for the Solution of Arbitrary Free Surface Flows, 3rd SA Conference on Applied Mechanics, Durban, 2000.
- Mahomed N. and Kekana M., Adaptive Mesh Refinement Analysis for Elliptic Problems based on the Equalisation of the Approximate Strain Energy, 31st Polish Conference on Solid Mechanics, Polish Academy of Sciences, Warsaw, Poland, 1996.
- Mahomed N. and Kekana M., Adaptive Mesh Refinement Analysis for Non-Newtonian Stokes Flow, 1st SA Conference on Applied Mechanics, Johannesburg, 1996.
- Li, Kong X.Y., Huang Y., Xie Z.P., Mahomed N., Sun B.H., Microwave Interaction with Ceramics and its Application to Solid Solutions, 1st International Conference on Composite Science and Technology, University of Natal, Durban, South Africa, 1996.

Conferences (non-peer reviewed)

- Mahomed N. and Kleynhans H.A., Mahomed N., Evaluation of Porosity Defects in High Performance Steel Castings - Experiences using Simulation and Post Cast Evaluation, *International Conference on Green Manufacturing*, Weifang, China, Sep 2017.
- Mahfoudhi M. and Mahomed N., Numerical Optimisation of Electron Beam Physical Vapour Deposition (EB-PVD) coatings for Arbitrarily Shaped Surfaces, *SA Symposium on Metal Casting Technology*, Cape Town, November 2014.
- Rzyankina E., Szeliga D., Mahomed N. and A. Nowotnik, Investigation of the effect of Solidification Velocity on the quality of Single Crystal Turbine Blades, *SA Symposium on Metal Casting Technology*, Cape Town, November 2014.

- Rzyankina E., Pytel. M., Mahomed N., Rokicki, P., Nowotnik A., Influence of Solution Heat Treatment on CMSX-4 Ni-based Superalloy Singly Crystal Castings, *SA Symposium on Metal Casting Technology*, Cape Town, November 2014.
- Fourie J., Lelito J. and Mahomed N., Numerical Optimisation of the Gating System of an Inlet Valve Casting made of Titanium Alloy, *SA Symposium on Metal Casting Technology*, Cape Town, November 2014.
- Cupido L., Mahomed N., and Zak P., Experimental and Numerical Investigation of Heat Treatment of Al-Si-Cu Alloys, *SA Symposium on Metal Casting Technology*, Cape Town, November 2014.
- Mahomed N. and Skosana V., Imperatives for Technology Transfer in the South African Tooling Industry, First All Africa Technology Diffusion Conference, Johannesburg, June 2006.
- Mahomed N., Modelling and Simulation of Propellant Flow for Extrusion Die Design Optimisation, Proceedings, 3rd *RAPDASA Conference on Rapid Product Development*, Technikon Free State, November 2002.
- Mahomed N. and Mitchell G.P., An implicit method for determining the melt front position in the Finite Element Analysis of the Injection Moulding Filling Process, *13th Conference on Finite Element Methods in South Africa*, Stellenbosch, S.A., 1995.

Journal Publications (ORCID 0000-0002-3834-8817)

		Scopus citations
1.	Mahomed N. and Kekana M, An Error Estimator for Adaptive Mesh Refinement based on Strain Energy Equalisation , <i>International Journal on Computational Mechanics</i> , V 22, pp 355-366, 1998.	5
2.	Mahomed N. and Kleiber M, An Aspect Ratio Condition for the Buckling and Folding of Polymeric Jets in Injection Mould Filling , <i>Computer Assisted Mechanics and Engineering Sciences</i> , V 5, pp 227-243, 1998.	
3.	Mahomed N., Modelling and Simulation of Propellant Flow for Extrusion Die Design Optimisation , <i>Journal of Mechanics and MEMS</i> , V1 No.2, pp 223-235, 2009.	
4.	Sun B.H. and Mahomed N., Real-Time Ultrasonic Rail Health Monitoring System for both Heavy Haul Loads and High Speed Train – South Africa Overview , <i>Journal of Mechanics and MEMS</i> , V2 No.2, pp 55-59, 2010.	
5.	Rzyankina E., Szeliga D., Mahomed N. and A. Nowotnik, Investigation of the effect of Solidification Velocity on the quality of Single Crystal Turbine Blades , <i>Applied Mechanics and Materials</i> , Vol. 372, pp 54-61, 2013.	7
6.	Sackey S.M. et al, Collaborative meta-profile development to harmonise mechanical engineering education in Africa , <i>Tuning Journal for Higher Education</i> , V 2, No. 1, pp. 161 – 178, 2014.	1
7.	Cupido L.H., Zak P.L., Mahomed N., Lelito J., Piwowarski G. and Krajewski W., Experimental Investigation of Modified Heat Treatment of AK64-Type Al-Si-Cu Sand Cast Alloy , <i>Archives of Metallurgy and Materials</i> , V60, No. 3, 2015.	2
8.	Mahomed N., Industrial Centres of Competence: A South African Case Study , <i>Journal of Entrepreneurship and Innovation in Emerging Economies</i> , V2, No. 2, 2016.	

Recent Postgraduate Students Supervised

Level	Student	Institution	Research Title	Comments
Masters	E Rzyankina	CPUT	Numerical and Experimental Investigation of Directional Solidification in Vacuum Investment Casting of Superalloys	Completed 2013
	J Fourie	CPUT	Gating System Optimisation of Inlet Valve Casting made of Ti-6Al-2Sn-4Zr-2Mo-0.1Si Alloy	Completed 2014
	LH Cupido	CPUT	Experimental and Numerical Investigation of Heat Treatment of Al-Si-Cu Alloy	Completed 2014
	M du Plessis	CPUT	Sensitivity Analysis of EB-PVD Thermal Barrier Coatings for Aerospace Applications	Completed 2014
	M Mahfoudhi	CPUT	Numerical Optimisation of thickness distribution of EB-PVD Coatings	Completed 2015
	TT Kampoy	CPUT	Structural Optimisation of Spent Nuclear Fuel Storage Canisters	2015 Current
	HA Kleynhans	Stellenbosch University	Macrosegregation and Porosity Studies in large Ferrous Castings	2016 Current