GRADUATION CEREMONY

Faculty of Engineering & the Built Environment

SARAH BAARTMAN HALL

2 September 2024

FACULTY OF ENGINEERING & THE BUILT ENVIRONMENT

ORDER OF PROCEEDINGS

Academic Procession.

(The congregation is requested to stand as the procession enters the hall)

The Presiding Officer will constitute the congregation.

The National Anthem.

Welcome by the Master of Ceremonies.

Musical Item.

The graduands will be presented to the Presiding Officer by the Dean of the faculty.

The Presiding Officer will congratulate the new graduates.

The Master of Ceremonies will make closing announcements and invite the congregation to stand.

The Presiding Officer will dissolve the congregation.

The procession, including the new graduates, will leave the hall.

(The congregation is requested to remain standing until the procession has left the hall.)

NATIONAL ANTHEM

Nkosi sikelel' iAfrika
Maluphakanyisw' uphondolwayo,
Yizwa imithandazo yethu,
Nkosi sikelela, thina lusapho lwayo.

Morena boloka etjhaba sa heso,
O fedise dintwa la matshwenyeho,
O se boloke,
O se boloke setjhaba sa heso,
Setjhaba sa South Afrika – South Afrika.

Uit die blou van onse hemel,
Uit die diepte van ons see,
Oor ons ewige gebergtes,
Waar die kranse antwoord gee,

Sounds the call to come together,
And united we shall stand,
Let us live and strive for freedom,
In South Africa our land.

NAMES OF GRADUANDS

FACULTY OF ENGINEERING AND THE BUILT ENVIRONMENT

Dean: Professor A Lewis

DEGREE OF BACHELOR OF ARCHITECTURAL STUDIES

Chinje, Jemmie Amana
Lineveldt, Liam
Manzini, Fatima
Ndhlovu, Emmanuel Siyabonga (with distinction)
Nel, Eben
Tizora, Sade Clerise Naomi

DEGREE OF BACHELOR OF SCIENCE IN CONSTRUCTION STUDIES

Akpabio, Edikan Ubon
Boetcher, Anthony Robert (with distinction)
Booi, Simamkele
Bowers, Eryne Kayla
Hlabangani, Lihlithemba
Jordaan, Kyle Rubin
Kgasoane, Naledi Oagile
Magadla, Sinawo Siseko
Maina, Alex Kamau
Mdzanga, Sakhikhaya
Minter, Jordan Jude
Mlondleni, Lihle
Moll, Jessica Rachel-Ann
Mun, Jinwon
Ndlovu, Olwethu Nolwazi
Ngubombini, Asakhe
Nokhanga, Lisolethu
Rajkumar, Yoshiel
Ram, Kaveer
Sebegi, Thato Matsapole
Somaguda, Sinawo
Sproul, Ryan
Zwane, Nolwazi Ndondo

DEGREE OF BACHELOR OF SCIENCE IN ENGINEERING IN CHEMICAL ENGINEERING

Khobo, Mpho Kwesi
Madziya, Tariro Priscilla (with honours)
Maliehe, Mamello
Sebastian, Rene
Sekudu, Queen Ntombizodwa
Wiseman, Sadie Alexandra

DEGREE OF BACHELOR OF SCIENCE IN ENGINEERING IN CIVIL ENGINEERING

Ally, Abdu-Shakoor
Cutalele, Nita Precious
Dladla, Thabisile Jennise
Dlilifa, Fanelesibonge
Dramat, Khalil
Dusabimana, Victor
Kubheka, Banele
Madala, Mxolisi
Ndlovu, Zibusiso (with honours)
Nkosi, Mondli

DEGREE OF BACHELOR OF SCIENCE IN ENGINEERING IN ELECTRICAL AND COMPUTER ENGINEERING

Burditt, Jake Edward Elgar (with honours)
Clegg, Thomas Matthew
Goodson, Samuel Jack
Gumo, Pius Christian
Mollah, Refat
Moore, David
Mpetsheni, Vuyisa
Nichollas, Gabriel Gregory
Shaw, Oliver Fraser
Sithole, Kimmy Tina
Stuart, Reid Brady
Zulu, Muziwakhe Wellington

DEGREE OF BACHELOR OF SCIENCE IN ENGINEERING IN ELECTRICAL ENGINEERING

Cloete, Adam James
Curry, Liam
Leanya, Refiloe Francis (with honours)
Malakalaka, Clement Thabiso
Motsoasele, Matekoa Benedict
Ngubane, Siyanqoba Wiseman
Salie, Abu Bakr

DEGREE OF BACHELOR OF SCIENCE IN ENGINEERING IN MECHANICAL AND MECHATRONIC ENGINEERING

Antonio, Aldo Natalichio
Buthelezi, Mnelisi Sinakhokonke
Davis, Cameron Richard (with honours)
Gamiet, Muhammad Faeeq
Gwatiringa, Tanaka Tafirei (with honours)
Hamlin, Thomas Ralph Pitt
Macedo, Ayla Sabrina
Matshona, Rokuniswa
Mhlanga, Tengetile Thembekile (with honours)
Mohadev, Avishkar
Moyo, Thandiwe Fulata
Naidoo, Lohini
Ndeh Foute, Arthur (with honours)
Nguimfack Ngouatou, Aymard Jeff (with honours)
Nkosi, Dumsane Joshua (with honours)
Siphungu, Simphiwe Howard
Thanarayen, Amiel
Zhanje, Tariro Thandiwe

DEGREE OF BACHELOR OF SCIENCE IN ENGINEERING IN MECHANICAL ENGINEERING

Ackermann, Jordan Henry
Chikuvadze, Ernest
Chowdhury, Somdatta
Daemane, Motsarapane Paul
Dikgale, Pheladi Pearl
Goldman, Charles Louis (with honours)
Gosain, Amr
Harris, Samir (with honours)
Hlungwani, Mylord Nyikiwa
Karodia, Hannah
Madubedube, Sinabo
Mathomane, Lwandile
Matshana, Tshireletso
Mbumwae, Mwangala
Mhlabeni, Mthobeli
Mugaviri Mugore, Memory
Mulenga, Chanda Clement
Ngcobo, Mahlatse Lucky
Ngosi, Davis
Nzimande, Luyanda
Pattundeen, Anshul (with honours)
Seabela, Hunadi Mankoana
Shulman, Binyamin Moshe
Sithole, Mthokozisi Themba
Tshamano, Mashudu Cynthia

DEGREE OF BACHELOR OF SCIENCE IN ENGINEERING IN MECHATRONICS

Abrahams, Benjamin
Koopalame, Rebaone
Leseli, Matsoso Emmanuel
Motala, Muhammad
Msomi, Luyanda Silindokuhle
Nel, Harry
Raw, Dylan Vause
Reddy, Pranaam
Taliep, Rasheeda
Tleane, Nthabiseng Rose

DEGREE OF BACHELOR OF SCIENCE IN GEOMATICS

Brown, Garner (with honours)
Mapheto, Mahlogonolo Selabi
Monaheng, Maphoma Joseph
Sukdao, Ashik
Willie, Sheldon Edgar

DEGREE OF BACHELOR OF SCIENCE IN PROPERTY STUDIES

Biyana, Qaqamba Thala Akhona
Clarke, Sean Russell
Dladla, Vezubuhle Samkele
Hardy, Nzuzo Tatenda
Jambwa, Rukudzo
Mamphaga, Rinae
May, Cameron Oliver
Mdladlamba, Bontle Veronica
Mnguni, Lusanda Asanda
Sasman, Jordan
Steere, Matthew Jon
Swarts, Brendan Russel
Thela, Nomasuku Onthatile
Warren, Alex David

DEGREE OF BACHELOR OF ARCHITECTURAL STUDIES HONOURS

Aziz, Mubeena
Gierdien, Kawthar
Van Der Merwe, Kyle
Van Der Schyff, Aadam

DEGREE OF BACHELOR OF CITY PLANNING HONOURS

Mokwaledi, Tshepo
Mthembu, Nomfundo
Sikundla, Josiah
Van Rooyen, Raevaldo Ej (in the first class)

DEGREE OF BACHELOR OF LANDSCAPE ARCHITECTURE HONOURS

Kweleta, Sivuyile

DEGREE OF BACHELOR OF SCIENCE HONOURS IN CONSTRUCTION MANAGEMENT

Geza, Simbarashe
Hlophe, Perseverance Luvuyo
Krige, Leah Maxine
Mathevula, Vuyelo Nicolus
Sakeng, Lesiba Frans
Senkumba, Edna Nakazzi

DEGREE OF BACHELOR OF SCIENCE HONOURS IN GEOGRAPHICAL INFORMATION SYSTEMS

Mabathoana, Relebohile Anna
Mteshane, Sanele Moses
Radebe, Siphesihle Mfanafuthi
Yimba, Sikholiwe Sinothile
Zuma, Phumlani

DEGREE OF BACHELOR OF SCIENCE HONOURS IN PROPERTY STUDIES

Elliott, Kyle Michael
Mangcu, Sichume Lilitha
Van Den Heever, Alexandra Grace
Van Der Merwe, Isobella Marie

DEGREE OF BACHELOR OF SCIENCE HONOURS IN QUANTITY SURVEYING

Chekai, Tanaka Leeroy
Chinasamy, Darmarajan
Moonga, Gerald
Mthembu, Dineo Unathi
Phaswana, Elelwani Mathilda
Pina, Danon Alexander
Ramsay, Adam David Strachan

DEGREE OF MASTER OF ARCHITECTURE

Davids, Sara
Goolammamode, Muhammad Yoosoof
Molopyane, Palesa
Sineke, Lundi Mihla

DEGREE OF MASTER OF CITY AND REGIONAL PLANNING

Xulu, Zakithi

DEGREE OF MASTER OF ENGINEERING

Blose, Maxwell Mazwi (with distinction in the dissertation)
Dass, Reevelen (with distinction)
Haider, Syed Mohammed Mehdi
Itana, Kristof

DEGREE OF MASTER OF ENGINEERING IN CIVIL INFRASTRUCTURE MANAGEMENT AND MAINTENANCE

Beachcroft-Shaw, Matthew

DEGREE OF MASTER OF LANDSCAPE ARCHITECTURE

Farrenkothen, Roderick James

DEGREE OF MASTER OF PHILOSOPHY

Akuaake, Iyaloo Taimi (with distinction in the dissertation)
Calvert, Gregory Malcolm
Cardenas, Juan Pablo (with distinction)
Chipangura, Moreblessing
Galimoto, McDonald Benson
Gerber, Lenize
Gibbons, Lucy Pola (with distinction)
Lindsay-Smith, Luisa Maria
Maongera, Brendon Crispen
Mewalal, Suveer
Omar, Anwar

Wielenga, Rutger

DEGREE OF MASTER OF SCIENCE IN ENGINEERING

Abrahams, Liam Meynell
Aketch, Jacob Mator
Alqarni, Yazeed
Bampfield-Duggan, Jonathan Stuart (with distinction)
Borrageiro, Roberto Antonio
Bright, Daryn Andrew (with distinction)
Carstens, Wilhelm Lauréns (with distinction in the dissertation)
Chaza, Nyika Mufudzi (with distinction in the dissertation)
Du Toit, Riyazah Nawaal
Econi, Jonathan Arthur Olivu (with distinction)
Gcwensa, Thamsanqa Lucky (with distinction)
Gwasira, Thomas
Hampwaye, Nasonkwe (with distinction)
Khumalo, Ndumiso Mpumelelo (with distinction)
Laugksch, Kristina Karli (with distinction)
Lombard, James Robert (with distinction)
Lunt, Stuart Alexander
Luyaba, Lubabalo
Mahomed, Nadiya Nazeema Joy
Montandon, Fraser Derrick Charles (with distinction)
Moodley, Hugendra Rishay (with distinction)
Mtemeli, Patronella Siphatisiwe
Mukuna, Ngeleka Marco
Mukwenya, Rufaro Chantelle (with distinction)
Ngubane, Mphikiseni Michael
Njume, Epie Wesner
Nwachukwu, Sampson Ebuka (with distinction)
Ramasenya, Koena
Seeger, Danielle
Sehobai, Sehobai Elliot (with distinction)
Setshekgamollo, Mokgadi
Shikangala, Martha Peneyambeko
Sikushumane, Morina (with distinction)
Soares, Tais Mei Dos Santos Mei (with distinction in the dissertation)
Solomon, Zamuxolo Gladwill
Tabata, Kamvelihle Masomelele (with distinction in the dissertation)
Thomas, Malcolm Rhys (with distinction)
Williams, Aqeel Andrew (with distinction)
Yumbu, Alex Musyoka (with distinction)
Zandamela, Frank (with distinction)

DEGREE OF MASTER OF SCIENCE IN PROJECT MANAGEMENT

Samsodien, Moegamat Raafiek

DEGREE OF MASTER OF SCIENCE IN PROPERTY STUDIES

Emsley, Liezl Isabel (with distinction in the coursework component)
Jones, Shane
Mapira, Fungisai Marcia Diedry (with distinction in the dissertation)
Marshall, Justin Garnet
Nel, Paul
Penxa, Phucuka Penelope
Porter, David Ryan
Scholtz, Michelle (with distinction)
Thebe, Moloedi Andries
Watermeyer, Peter Scott (with distinction in the dissertation)

DEGREE OF MASTER OF URBAN DESIGN

Nangula, Soini Etuhole

DEGREE OF MASTER OF WATER ENGINEERING

Heita, James Hango
Jacobs, Yolandi
Slabbert, Markus Johannes

DEGREE OF DOCTOR OF PHILOSOPHY

Amadi, Ichebadu George
Thesis Title: *Enhancing the properties of fine recycled aggregate concrete*

Before joining UCT for his PhD in August 2019, Ichebadu Amadi completed his Bachelor of Engineering degree at the University of Nigeria, Nigeria, and an MSc at Coventry University, United Kingdom.

Ichebadu Amadi's thesis focuses on practical ways of optimising and enhancing the use of fine recycled aggregate (FRA) such that the inherent properties such as adhered cement paste (ACP), porosity and multiple interfacial transition zones have limited consequences on concrete properties. The study adopted several enhancement techniques: the use of locally available supplementary cementitious materials (SCM) such as fly ash and ground granulated blast-furnace slag; the systematic screening of FRA particle sizes less than 1.18 mm; and appropriate material selection and mixing procedures to improve the mechanical and durability properties of FRA concrete for structural applications. Results show that the chemical phases present in the ACP of FRA contribute to the pore chemistry and subsequent performance of concrete. The study demonstrates that the use of up to 50% FRA for structural concrete application is feasible, and the performance of FRA concrete can further be enhanced using SCMs, particularly fly ash.

Supervisor: Professor H Beushausen (Civil Engineering)
Co-supervisor: Emeritus Professor M Alexander (Civil Engineering)

Birabwa, Denise Joanitah
Thesis Title: *Efficient radio resource management in integrated terrestrial and non-terrestrial networks*

Denise Joanitah Birabwa received BSc and MSc degrees in Telecommunications from Makerere University, Uganda, and the University of Trento, Italy, respectively. She joined the Department of Electrical Engineering at UCT for her PhD studies in 2020. She is also an assistant lecturer at Kyambogo University, Uganda.

Denise Birabwa's thesis focuses on integrating non-terrestrial networks, such as satellites and unmanned aerial vehicles, with terrestrial networks like 5G, to provide radio access to wireless telecommunications networks. Her work focuses on a usage scenario in which many users generate traffic that the terrestrial network access nodes cannot entirely support in, for example, an urban

area during a crowd event. Such a usage scenario necessitates the deployment of non-terrestrial networks to decongest and support the terrestrial network in providing radio access to different users. The networks in this integration have different capabilities and limitations in meeting heterogeneous user demands; thus, mapping users to the appropriate network is not trivial. Consequently, her thesis proposes efficient user association and resource allocation algorithms based on metaheuristics and artificial intelligence that achieve a spectrum-efficient and energy-efficient integrated network while considering the diverse user requirements and the unique characteristics of integrated radio access networks.

Supervisor: Dr D Ramotsoela (Electrical Engineering)
Co-supervisor: The late Mr. N Ventura (Electrical Engineering)

Boodhram, Farana Pramrajh
Thesis Title: *Gender equity and business leadership in the South African mining sector*

Farana Boodhram has been an entrepreneur in the mining industry for the last 23 years. She obtained an Executive MBA from UCT's Graduate School of Business in 2017 and enrolled for her PhD studies at UCT in 2020.

Farana Boodhram's thesis presents the first study of the challenges and opportunities for greater representation of women in business in the South African mining industry. Interviews were held with high profile leaders in a wide range of leadership and management positions. The results reveal the extent to which the historic, systemic exclusion of women has resulted in cultural exclusion as women seek to integrate into the male-dominant culture. Not only has this prevented the full participation of women but the industry has failed to harness the benefit of gender diversity. The findings can form the basis for new strategic and economic opportunities, a priority for the mining sector. The research insights, if acted upon, can address economic growth, private and public sector performance and income inequality. They have the potential to promote gender equality and create an environment that enables women's greater participation and advancement in mining, and beyond.

Supervisor: Professor J Petersen (Chemistry)
Co-supervisors: Associate Professor J Broadhurst (Chemistry); Emeritus Professor M Hall (Graduate School of Business)

Bruintjies, Mark Anthony
Thesis Title: *Testing for relationship between diagnostic tests and DC BDV of in-serviced aged stator bars of a hydro generator*

Mark Bruintjies completed a BTech at Cape Peninsula University of Technology in 1999, and an MSc (Eng) (Electrical Engineering) at the University of Cape Town in 2012. He began part-time studies towards his PhD at UCT in 2013.

Mark Bruintjie's thesis focuses on the ability of traditional diagnostic tests to predict insulation failure of stator bars in air-cooled hydrogenerators. He subjected aged stator bars from a hydrogenerator to traditional diagnostic tests to detect the level of degradation of the insulation material or the development of incipient faults. From these test results, he found that no particular parameter, or a combination of parameters, could predict imminent failure of the insulation material, nor was there any correlation between the diagnostic parameters and high voltage breakdown tests. The thesis concludes that the most value derived from these tests would be to utilise the results as trending parameters.

Supervisor: Professor P Barendse (Electrical Engineering)
Co-supervisor: Emeritus Professor CT Gaunt (Electrical Engineering)

Filtane, Amanda Alicia
Thesis Title: *Diversification and dynamic capabilities within Construction Business Models and their impact on firm performance*

Amanda Filtane holds a Master of Philosophy in Construction Economics and Management from the University of Cape Town. Amanda holds a BIM certificate from Aalto University, Finland, and a Computing in Construction certificate from the EC3 in Italy. She has presented her research at local and international conferences.

Amanda Filtane's thesis evaluates construction business model patterns and performance in South Africa. She finds that international diversification of construction business portfolios has a statistically significant correlation with construction sector diversification and resources within construction organizations. Physical and human resources significantly correlate with construction sector diversification. Her findings demonstrate and support the theory of dynamic capabilities as value drivers within construction organizations and that physical and human resources are critical for the optimum performance of construction organizations. Amanda developed a programmable coded framework for modelling construction business elements.

Supervisor: Professor A Windapo (Construction Economics and Management)

Fischer, Ayanda Candice
Thesis Title: *When will the 'lokshin' MyCiTi bus arrive for first thursdays in the city? Exploring township-dwelling people's perspectives on mobility for discretionary activity participation after peak-time hours in Cape Town*

Ayanda Candice Fischer completed her BSoc Sci, BSoc Sci (Hons) and MPhil qualifications at the University of Cape Town (UCT).

Ayanda Candice Fischer explores the problem of township-based mobility for participation in discretionary activities after peak travel periods. Her study presents empirical observations of

this problem in the so-called *"amaphela operated area*" in the Cape Flats of Cape Town. She provides descriptions of township-dweller's experiences in the study area to understand and explain the causes that surround the phenomena of township-based immobility and social exclusion. Her findings offer policymakers and transport planners insight into how living conditions might be improved, and social exclusion alleviated, for those living on the Cape Flats. Ayanda finds that increasing the number of public transit services during the peak hours, and expediting roll out of efficient and safer public transportation services such as the Bus Rapid Transit (BRT) and reinvigorating the Metrorail trains could improve the situation.

Supervisor: Professor M Zuidgeest (Civil Engineering)
Co-supervisor: Professor R Behrens (Civil Engineering)

Goga, Taahira
Thesis Title: *A life cycle-based investigation into the potential of a circular and low-carbon plastics economy in South Africa*

Taahira Goga obtained BSc (Eng) (Hons) (2013) and MSc (Eng) (2017) degrees at the University of KwaZulu-Natal. She has published on Life Cycle Assessment, and commenced her PhD studies at UCT in 2019. From 2023, she has been employed as a Researcher at the Council for Scientific and Industrial Research.

Taahira Goga's thesis explores how South Africa's plastics industry could become circular with low greenhouse gas emissions. It estimates that in 2018, only 18% of all plastics sold in South Africa were from recycled material, whilst upwards of 350 kT of plastic waste leaked into the natural environment. At the same time, plastics contributed 17 Mt of carbon dioxide equivalents, just short of 4% of all greenhouse gas emissions in South Africa. The thesis demonstrates that a combination of interventions including demand moderation and more mechanical recycling can significantly improve indicators of circularity, but are by themselves not enough to prevent leakage into the environment. Coupling these measures with emission reductions in monomer production and decarbonisation of energy use could reduce carbon emissions in the plastics sector at a pace and scale required by climate science.

Supervisor: Professor H von Blottnitz (Chemical Engineering)
Co-supervisors: Dr V Russo (Council for Scientific and Industrial Research); A/ Professor K Harding (University of the Witwatersrand, School of Chemical and Metallurgical Engineering)

Kaluba, Chisanga
Thesis Title: *Influence of symmetry on the stability behaviour of plane and space frames*

Chisanga Kaluba holds BEng and MEng degrees from the University of Zambia and Tongji University in China, respectively. He joined UCT in 2018 for his PhD studies.

Chisanga Kaluba's thesis investigates the influence of symmetry on the stability behaviour of plane and space frames, with a particular focus on structural configurations that belong to higher-order symmetry groups. These configurations find application in the civil and mechanical engineering disciplines, as well as the marine and aerospace industries. However, their buckling behaviour is complex and not yet fully understood. Through analytical and computational modelling, Chisanga Kaluba uses the mathematical formulations of group theory to explore the relationship between buckling behaviour and symmetry properties. His main finding is that structural symmetry has a large influence on both the buckling strength and the buckling patterns of plane and space frames, and this must be taken into account in their design.

Supervisor: Professor A Zingoni (Civil Engineering)

Mabesa, Mamphaka Jeanett
Thesis Title: *Analysis of the land administration and housing management systems in view of adequate self-built incremental housing development in Lesotho*

Mamphaka Jeanett Mabesa completed an MPhil Degree specialising in Geomatics from the University of Cape Town in 2011 and holds a Bachelor of Arts Degree in Urban and Regional Planning from the National University of Lesotho.

Mamphaka Mabesa analyses Lesotho's post-reform land administration and housing management systems, to support adequate housing delivery through self-built incremental housing development. Multiple conflicting rationalities are identified while self-built incremental housing continues to develop in a fragmented, siloed manner. Disconnection between the land administration and housing systems and the lived experiences of dwellers, particularly their everyday struggles to access adequate housing, remain critical barriers to meeting the goal of adequate housing delivery. This research recommends the integration of the land administration and housing systems in Lesotho while embracing a human-rights-based approach to adequate housing, and consideration of social housing delivery. Furthermore, spatial planning at the local government level should be harmonised with national strategic development plans while State capacity development is also required. Guidelines should be produced to mainstream this form of housing delivery, including strategic objectives and performance indicators, so that conflicting rationalities and lack of integration are addressed.

Supervisor: Professor J Whittal (Geomatics)

Mapurisa, Willard Tapiwa
Thesis Title: *Accumulator-based three dimensional building boundary reconstruction framework for satellite images*

Willard Mapurisa began his postgraduate studies in 2007 at the University of Cape Town, specialising in three-dimensional (3D) reconstruction of objects from point clouds. Upon completion of his studies, he joined Luxcarta and the South African National Space Agency where he continues interest in 3D modelling from images.

Willard Mapurisa's dissertation focuses on creating 3D models of the built environment using multi-view satellite images. He investigates how the boundary shapes and level of detail of modelled buildings can be improved when creating 3D models using images. He investigates how building edges that form building boundaries can automatically be detected in 2D images and reconstructed in 3D, while maintaining accuracy. His research finds that boundaries are better modelled as piecewise, connected linear segments by reducing edge fragmentation and missing edges. Furthermore, by detecting dense edges and matching them across multiview images, the resulting shapes and level of detail improves. His research provides an alternative to the traditional pixel matching, by matching edges modelled as piecewise connected linear segments. He demonstrates that reconstructing building models using detected lines results in improved boundaries and level of detail.

Supervisor: Dr G Sithole (Geomatics)
Administrative supervisor: Dr P Tumubweinee (School of Architecture, Planning & Geomatics)

Moydien, Mohamed Hassan
Thesis Title: *Porous titanium felts as alternative metal gas diffusion layers for low temperature PEM fuel cells*

Hassan Moydien completed his BSc (2017) and MSc (2019) in Chemical Engineering at UCT, and subsequently began full-time study towards his PhD in 2020.

Hassan Moydien's thesis focuses on one of the critical components of a proton exchange membrane fuel cell (PEMFC), an alternative sustainable energy conversion technology which generates electricity from hydrogen producing water as the only by-product. He investigates the use of a novel titanium fibre felt as an alternative to the conventional carbon fibre gas diffusion layer (GDL) which is susceptible to mechanical and chemical degradation over time. Substituting the novel titanium felt resulted in a significant and consistent improvement in fuel cell performance relative to the commercial carbon GDL benchmark. In addition to presenting a high-performance GDL alternative, the study also develops an in-depth understanding of key mass transport and water management properties of the titanium felts which can be directly utilised in further development of alternative GDL materials and advanced fuel cell components.

Supervisor: Dr D Susac (Chemical Engineering)
Co-supervisor: A/Professor P Levecque (Chemical Engineering)

Pailman, Whitney Lisa
Thesis Title: *Towards Integrated Business and Partnership Models for Universal Energy Access in Kenya and Rwanda*

Whitney Pailman holds a Bachelor of Engineering (Civil Engineering) from the University of Johannesburg, and a MPhil in Energy Studies from UCT, and commenced her PhD studies in 2017. She has also worked on interdisciplinary energy access projects in Sub-Saharan Africa.

Whitney Pailman's thesis focuses on integrated partnership and financing models for universal energy access in Kenya and Rwanda. Her thesis expands on the Integrated Distribution Framework (iDF), which has been conceptualised to address the viability gap for off-grid electrification models and to support the achievement of universal energy access. This framework is premised on four core principles, namely i) inclusiveness, ii) permanence, iii) a combination of electrification modes, and (iv) external finance for viable electrification models. Whitney's thesis applies the IDF to Public Private Partnerships (PPPs) and Results Based Finance (RBF) models for mini-grids and stand-alone solar system models in Kenya and Rwanda. Her thesis demonstrates how the framing of the IDF can improve the permanence and inclusivity of PPPs and RBF, and how combinations of electrification modes can impact the roll-out and success of off-grid electrification programmes, and provides recommendations for strengthening the financing ecosystem.

Supervisor: Dr J de Groot (African Climate & Development Initiative)

Ramdhin, Avinash
Thesis Title: *Creating additional network capacity on constrained medium voltage networks utilizing distributed generation (specifically PV technology)*

Avinash Ramdhin completed his BSc (Eng) in Electronic Engineering at UKZN, Howard College, and an MSc (Eng) in Electrical Engineering at UCT. He is currently a full-time senior engineer at Eskom Holdings, Distribution, and undertook part-time studies for his PhD degree from 2015.

Avinash Ramdhin's thesis focuses on optimal placement of solar PV distributed generation to create additional network capacity on constrained medium voltage (MV) electrical networks. The research investigates the short-term and long-term mitigation solutions implemented on constrained networks where the solutions and their investments are influenced by strategic load forecasting, installation of voltage regulators, shunt compensation, building new substations and/or various other network strengthening solutions. He develops a DIgSILENT Powerfactory language (DPL) coded method for network analysis supported by a data analytic interface in Microsoft Excel. This tool optimally places PV systems to the MV network using Particle Swarm Optimization algorithm to maximize network capacity, and is quantified by defining an objective function that relates network capacity improvement to PV power generation. Conventional methods

for simulating PV systems were used to compare the results and effectiveness of the tool.

Supervisor: Associate Professor S Chowdhury (Electrical Engineering)

Robertson, Stefan Walters
Thesis Title: *Properties governing the flow of solution and air through crushed ore for heap leaching*

Stefan Robertson has BSc (Eng) and MSc (Eng) degrees in Chemical Engineering from the University of Cape Town. He is a Chief Engineer at Mintek, where he has worked for 26 years in the fields of hydrometallurgy and heap leaching. He began part-time study towards his PhD in 2020.

Stefan Robertson's thesis focuses on the effect of physical properties of crushed rocks, ores and agglomerates on heap leach hydraulics. Physical and hydraulic data were processed, gathered over 2 decades in heap leach amenability testing for clients. He shows that single-phase, saturated flow can be modelled with packed bed theory, employing the concept of a hydraulic radius. He shows that traditional soil models such as Van Genuchten-Mualem can be employed to fit unsaturated flow, but the curve is discontinuous and governed throughout by capillary flow, rather than a dual porosity model, as proposed by most investigators. He also shows that only approximately 65% of the void porosity is associated with interconnected pores and is available for air flow. He also proves that modified cement can be used as a cost-effective agglomeration binder to enable whole-ore heap leaching of otherwise marginal, low-permeability ores in acid medium.

Supervisor: Professor J Petersen (Chemical Engineering)
Co-supervisor: Dr P van Staden (Mintek)

Rzyankina, Ekaterina
Thesis Title: *Digital literacy practices of engineering students and lecturers using e- textbooks at a university of technology in South Africa*

Ekaterina Rzyankina holds a Diploma in Chemical Engineering; BSc Mechanical Engineering, Ural State Technical University, Russian Federation; and MTech (Mechanical Engineering, 2014) and a Postgraduate Diploma in Teaching and Learning (TL) in Higher Education (HE) from Cape Peninsula University of Technology.

Ekaterina Rzyankina's thesis in Engineering Education focuses on digital literacy practices associated with Physics e-textbooks at a University of Technology in South Africa. She investigates the digital interaction of first-year engineering students from two departments, Chemical Engineering and Maritime Studies, with e-textbooks. She reports on lecturer interviews to understand how e-textbooks are integrated in teaching. The study finds that limited prior exposure to working with digital texts hinders the utilisation of e-texts for study purposes. Students exhibit different patterns of literacy practices and need targeted support to fully engage with the affordances of e-texts. Lecturers face their own challenges around changing roles with the introduction of e-texts, and providing scaffolding to students. Cultural Historical Activity Theory and Mediated Discourse Analysis provide useful ways to analyse the contradictions identified in the data. This study enhances our understanding of digital literacy practices of students and lecturers in engineering education using e-textbooks.

Supervisor: Dr R Smit (Engineering Education)
Co-supervisor: Associate Professor Z Simpson (University of Johannesburg, Engineering Education)

VISION AND MISSION
UNIVERSITY OF CAPE TOWN

Vision

An inclusive and engaged research-intensive African university that inspires creativity through outstanding achievements in learning, discovery and citizenship; enhancing the lives of its students and staff, advancing a more equitable and sustainable social order and influencing the global higher education landscape.

Mission

UCT is committed to engaging with the key issues of our natural and social worlds through outstanding teaching, research and scholarship. We seek to advance the status and distinctiveness of scholarship in Africa through building strategic partnerships across the continent, the global south and the rest of the world.

UCT provides a vibrant and supportive intellectual environment that attracts and connects people from all over the world.

We aim to produce graduates and future leaders who are influential locally and globally. Our qualifications are locally applicable and internationally acclaimed, underpinned by values of engaged citizenship and social justice. Our scholarship and research have a positive impact on our society and our environment.

We will actively advance the pace of transformation within our University and beyond, nurturing an inclusive institutional culture which embraces diversity.

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Today is not the end of your relationship with the university - its the beginning of a new phase in your continuing relationship with UCT. It's a journey you share with the global UCT community of over 200 000 alumni. Wherever you choose to go, fellow UCT alumni will be there. Join UCT Alumni Connect, our bespoke social networking site for alumni. Membership is free and provides access to a global network of like-minded professionals, innovators, thought leaders and entrepreneurs. Join our virtual alumni community today and enjoy these member benefits:

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To remain in contact with former UCT classmates and to keep abreast of important developments taking place at your alma mater, make sure that you update your contact details on our website: www.alumni@uct.ac.za. Here are some of the other ways you can stay in touch with us:

- Attend UCT alumni events hosted in your region
- Participate in the AGM of Convocation
- Join UCT Alumni Connect today
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- Visit the Alumni Relations team in the Old Admin Building, located on UCT Lower Campus
- We love to profile our alumni. Email your news to: alumni@uct.ac.za

UCT benefits from a global network of alumni ambassadors, chapters and affinity groups, with an increasing number of volunteer networks across Africa. Our international UCT offices are focal points for leveraging institutional and research relationships, as well as donor opportunities. You can connect with one of our regional offices:

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The Development and Alumni Department looks forward to meeting you. Join us at one of the many alumni events hosted around the world, on campus at a UCT public lecture, at UCT Summer School or at your class reunion. Let's stay connected.