

PROGRAM VIR DIE TWEEDE PLEGTIGHEID

DIE FAKULTEITE TEOLOGIE EN INGENIEURSWESE

'n Vriendelike beroep word op alle aanwesiges gedoen om selfone af te skakel en nie die saal tydens die plegtigheid te verlaat nie en sodoende te verseker dat die verrigtinge sonder ontwrigting verloop.

1. Akademiese prosesie kom die saal binne. U word versoek om te staan terwyl hulle die saal binnekom en te bly staan vir die sing van die Nasionale Lied.
2. Sing van die Nasionale Lied (kyk binneagterblad). Neem asseblief daarna u sitplekke in.
3. Konstituering deur die Visekanselier.
4. Verwelkoming deur die Visekanselier.
5. Voorstelling van kandidate wat kwalifikasies ontvang deur die dekane van die betrokke fakulteite en toekenning van kwalifikasies deur die Visekanselier.
6. Sluiting deur die Visekanselier.
7. Akademiese prosesie verlaat die verhoog.

Die aanwesiges word versoek om te bly staan totdat die akademiese prosesie uitgestap het.

PROGRAMME FOR THE SECOND CEREMONY

THE FACULTIES OF THEOLOGY AND ENGINEERING

To help ensure that the proceedings run their course without disruption, will all those present kindly keep their cell phones switched off, and refrain from leaving the hall, while the ceremony is in progress.

1. Entrance of academic procession into the hall. You are requested to stand while it enters, and then to remain standing for the singing of the National Anthem.
2. Singing of the National Anthem (see inside back cover). Thereafter, please be seated.
3. Congregation formally constituted by the Vice-Chancellor.
4. Welcome by the Vice-Chancellor.
5. Presentation of candidates receiving qualifications by the deans of the respective faculties and conferment of qualifications by the Vice-Chancellor.
6. Closing by the Vice-Chancellor.
7. The academic procession leaves the stage.

Those present are requested to remain standing until the entire academic procession has left the hall.

ISICWANGCISO-NKQUBO SOMSITHO WESIBINI

IIFAKHALTHI EYEZENKOLO NEYOBUNJINELI

Ukuqinisekisa ukuba umsitho uqala ngaphandle kwesiphazamiso, bonke abakhoyo bayacelwa ukuba bacime iiselfowuni zabo, kwaye bangaphumi eholweni ngeli xesha umsitho uqhubekayo.

1. Kungena umkhosi wemithika eholweni. Niyacelwa ukuba nime ngeenyawo xa ungena, nihlale nime njalo ukuze kuculwe uMhobe weSizwe.
2. Kuculwa uMhobe weSizwe (Jonga kumphakathi weqweqwe lokugqibela). Emva koko, ningahlala phantsi.
3. UMsitho uvulwa ngokusesikweni nguSekela-Tshansila.
4. Ulwamkelo lwenziwa nguSekela-Tshansila.
5. Ukunikezelwa kwezingqini-mfundo kubafundi ziintloko zeefakhalthi (iidin) ezichaphazelekayo nokuthweswa kwezingqini-mfundo nguSekela-Tshansila.
6. Ukuvalwa koMsitho nguSekela-Tshansila.
7. Umkhosi wemithika uyalishiya iqonga.

Bonke abakhoyo bayacelwa ukuba beme ngeenyawo de umkhosi wemithika ube uphume wonke eholweni.

KANDIDATE WAT KWALIFIKASIES ONTVANG

Die grade, diplomas en sertifikate van kandidate wat nie by die gradeplegtigheid teenwoordig kan wees nie, word in hulle afwesigheid toegeken.

CANDIDATES RECEIVING QUALIFICATIONS

The degrees, diplomas and certificates of candidates who are unable to attend the graduation ceremony in person are awarded in absentia.

ABAFUNDI ABAFUMANA IZINGQINI-MFUNDO

Izidanga, iidiploma kunye nezatifiketi zabafundi abangakwazanga ukubakho ubuqu kumsitho wothweso-zidanga bathweswa bengekho benjalo.

DOKTORSGRADE

DOCTORATES

EZOBUGQIRHA

Fakulteit Teologie

Faculty of Theology

IFakhalthi yezeNkolo

PhD

CHEN, Hui-Chun (New Testament)

The law and the gentiles in Acts 15: divine authority between the Scriptures of Israel and Jesus on the law

Two characteristic elements of the Jesus movement, as portrayed in Luke-Acts, are identified through the analysis of and comparison between the apostolic speeches in Acts 15 and the portrayal of Jesus' view of the law in the Gospel of Luke. Intertextual analysis shows the importance of internal disposition rather than external mechanisms in the relationship to God as well as the close association between calling upon the name of Jesus and the forgiveness of sins. These two elements characterise the Jesus movement as a continuation of the history of the people of God as contained in the Scriptures.

Supervisor: Prof J Punt

DANIEL, Nicodemus Pele (Practical Theology)

Preaching reconciliation: a study of the narratives in Genesis 37–50

This dissertation evaluates the narratives of Genesis 37–50 as a means of promoting reconciliation and social cohesion in the context of the Middle Belt Region of Nigeria. The candidate argues that the narratives of Joseph and his brothers in Genesis 37–50, may be used to preach reconciliation, in the light of the fact that these narratives portray transformations of thoughts and actions, towards a forgiveness that includes confession of evil done in the past. In fact the Joseph narratives aim to build a common future on the foundation of reconciliation, which is also the challenge facing Nigeria at present.

Supervisor: Prof JH Cilliers

Co-Supervisor: Prof LJM Claassens

DIDIER, Kasongo Wa Kumutombo
(Practical Theology)

Conflict resolution for sustainable development in the Democratic Republic of Congo: a practical theological perspective

Conflict and development are interconnected and, in the case of the DRC, the level of the country's poverty may find its explanation in its

long history of conflicts. This dissertation focuses on the role of the church in conflict resolution and its efforts to promote sustainable development from a theological perspective. The study, therefore, explores the history of the DRC and that of the Great Lakes Region in order to understand the Congolese crisis, as well as the theological concept of shalom in order to reflect on the church's role in conflict resolution and sustainable development.

Supervisor: Dr NF Bowers Du Toit

JACOBS, Solomon Marthinus (New Testament)

Lukan prophetic discourse and social conflict in early Roman Palestine

Socio-scientific investigation of the influence of Roman imperialism on social conflict traced ideological contrasts between the elite and non-elite in early Roman Palestine in selected pericopes of Luke's prophetic discourse. Lukan discourse indicted Roman patronage, extractive economic policies, the use of the Temple for religious and cultural legitimisation, and the neglect of covenantal theology in the public sphere, while emphasising Abrahamic covenantal kinship as a theological basis for social cohesion. Concurrent social patterns included positive reciprocity, table fellowship and messianic servanthood. These patterns acted as mechanisms to establish contrast communities that embodied an alternative vision of society.

Supervisor: Prof J Punt

MEKONNEN, Endale Sebsebe (New Testament)

The Torah and community formation: a comparative study of Matt 22:34–40 and Rom 13:8–14

Romans 13:8–4 and Matthew 22:34–40 present the commandments of the Law in the name of love to shape believers' perceptible identity. To love God or the neighbour means ultimately to obey the commandments of the Law. The commandments of the Law are actually practiced in the name of love, for love is avoiding evil and doing good as prescribed in the commandments. The Gospel of Matthew is not an anti-Pauline text; rather these texts converge regarding important aspects of the Law, while diverging in relation to the texts' specific genres and concerns.

Supervisor: Prof J Punt

Co-supervisor: Prof MJ Nel

MOMBERG, Martha Johanna (Systematic Theology)

Why activists? A case-study into the self-perceived motivations of selected South Africans and Jewish-Israelis in the Palestinian project

Questions concerning the genesis of values, including convictions and motivations that inspire activists in struggles, are of major importance for contemporary moral studies. In this case study in empirical ethics, South African and Jewish-Israeli activists share, by way of in-depth interviews, why they campaign for Palestinian rights. An inductive, thematic analysis of the material shows that they view the struggle as a focused lens for global issues of fear-induced power abuse, militarism, racism, greed, fundamentalism and misinformation. While case study findings are not governed by a logic of generalisation, these transnational activists perceive themselves as part of deeply meaningful global movements in the pursuit of identifiable moral values.

Supervisor: Dr LD Hansen

Co-supervisor: Prof DJ Smit

MOON, Sewon (New Testament)

Pilgrimage as singing and walking in the way of the law of Christ? Interpreting "dying to the law" in Gal. 2:19

Ancient Jewish pilgrimage serves as the social-historical context and heuristic model for interpreting an elusive text in Paul's autobiographical narrative. "Dying to the law, living by faith" functioned within Galatians' antithetical structure of worldly empire and divine kingdom, and resultant pressures to conform. As the present Jerusalem was not the mother city (pilgrimage centre) for Jesus's followers, and first-century Jewish law should not be equated with the law of God, Galatian believers who were delivered from the existing evil empire were expected to make a pilgrimage to God's presence in the heavenly Jerusalem, following past examples: Abraham, Paul and, in particular, Jesus Christ.

Supervisor: Prof J Punt

MURIWO, Golden (Old Testament)

The hesed and rahamim of God as resources of hope in contexts of individual and communal loss: a multi-dimensional reading of Lamentations

This dissertation argues that the book Lamentations can serve as a resource for hope. Literary features point to the central part of the book where the concepts *hesed* (loving kindness) and *rahamim* (compassion) of God occur, as the basis for having hope. The study reveals that the *hesed* and *rahamim* of God are social, active and enduring, and that they are contrasted to the anger of God, which is temporal. In an analogical reading, this study brings the Judean context of suffering into dialogue with the Zimbabwean context, offering lasting hope, healing and dignity to victims of the atrocities committed in the so-called *Gukurahundi*, *Murambatsvina* and *Hondo yeminda*.

Supervisor: Prof LC Jonker

NOETH, Carike (Systematic Theology)

Not justice, but care? An analysis of contemporary ethical theories in light of the love commandment

During recent decades, ethical theories of care and of justice, respectively, became influential in scholarship and public opinion. Their

relevance for both personal development and the formation of democratic culture is widely acknowledged. Sometimes construed as in opposition to one another, they are more often seen as integrated and mutually enriching. The work of two influential feminist ethicists, representing these two discourses, is studied from the perspective of Christian theological ethics. The love commandment, generally regarded as central to theological ethics, is taken as lens through which to consider whether and how theological ethics can benefit from these contemporary theories.

Supervisor: Prof DJ Smit

PHIRI, Jackson (New Testament)

Church and culture? Exploring the reception of women's ministries in the Reformed Church in Zambia in view of 1 Corinthians 14:26–40

The Reformed Church in Zambia was established in 1899, but only allowed women to serve in its official ministries since 2000. The study explores the general reception of this decision in view of the RCZ's understanding of 1 Corinthians 14 (on the silencing of women). It argues that the challenge is not only reading the Bible in socio-cultural context but also accounting for the contexts within which it is read today. In the end, it invites the church to interpret 1 Corinthians prophetically amidst centuries old cultural traditions that favoured male leadership, since the text is all about edifying the body of Christ.

Supervisor: Prof AEJ Mouton

SHAANIKA, Eliakim (Systematic Theology)

A historical study of reconciliation as a challenge to the Evangelical Lutheran Church in Namibia (ELCIN) 1970–2010

The candidate traces the history of ELCIN from the early period of the arrival of Finnish missionaries, through the German colonial period and the South African apartheid saga, and via the struggle for independence and the establishment of the liberated Namibia, to deal with the unfinished agenda of reconciliation and unity in the present day. Focussing on the period 1970 to 2010, he deals with the idea and concept of reconciliation in the religious backgrounds on which his church rests, namely the Jewish and Christian Scriptures, the ELCIN's engagement with reconciliation throughout its history, and the implications of a ministry of reconciliation in the post-independence era. The premise of the candidate is that cognisance should be taken of the African understanding of reconciliation in the discourse about national reconciliation.

Supervisor: Prof MA Plaatjies-van Huffel

WERAN, Aida Nasser Weran Kalo (Missiology)

Ethnic-religious conflict and 'people-to-people' dialogue in Sudan. A theological evaluation of the Sudan Presbyterian Evangelical Church's mission of reconciliation

This dissertation evaluates the participation and contribution of the Sudan Presbyterian Evangelical Church (SPEC) to processes of peace and reconciliation in Sudan. Leaders and members of SPEC mediated the relationship between peace and reconciliation by participating in conversations and 'people-to-people' dialogue of faith-based and social organisations. The candidate argues and demonstrates that SPEC

created opportunities which have enabled participants to redefine identities, positions and roles in relation to other stakeholders. This empirical theological research contributes to theory and practice of 'people-to-people' dialogue as proposed in an emerging framework and model of peace-making and reconciliation in intercultural theology and missiology.

Supervisor: Prof DX Simon

ZACHARIAH, BulusTakore (Old Testament)

Sin of the fathers upon the children to the third and fourth generation: an appraisal of Exodus 20:5 and Deuteronomy 5:9 in relation to an African theological understanding of original sin

Although the second commandment of the Decalogue in Exodus 20 and Deuteronomy 5 prohibits idolatry, it also raises the issue of the "sin of the fathers" that impacts on the children up to the third and fourth generation. In view of Jeremiah 31 and Ezekiel 18 the candidate argues for the co-existence of corporate and individual responsibility and thus critiques the conventional understanding that corporate responsibility was substituted by individual responsibility. This proposal has important implications for faith communities in Africa where ancestors or "fathers" are usually seen as benevolent and not as the source for the transgenerational transmission of sin.

Supervisor: Prof HL Bosman

Fakulteit Ingenieurswese

Faculty of Engineering

IFakhalthi yezobuNjineli

PhD

BERRY, Tari Michael (Mechanical Engineering)

Optimisation of multiscale ventilated package design for next-generation cold chain strategies of horticultural produce

This dissertation applied a multi-parameter and multi-scale approach to develop improved designs and guidelines for fresh produce packaging systems. Specifically, the potential implementation of alternative vent hole designs that improve performance in the cold chain was investigated. Furthermore, a computational fluid dynamics model was proposed to characterise moisture content values and distributions in stacked cartons during refrigerated shipping conditions. This model will facilitate enhanced carton mechanical strength testing protocols in the future. Lastly, the challenge of loading refrigerated freight containers was considered and an improved packaging design system for fresh produce export was proposed.

Supervisor: Dr C Coetzee

Co-supervisor: Prof UL Opara

CRIPWELL, Jamie Theo (Chemical Engineering)

Improvement of the thermodynamic description of polar molecules and their mixtures in the SAFT framework

Distillation remains the most widely employed separation technology in the chemical and petrochemical industries. Accurate description of

the underlying phase equilibrium phenomena is the traditional research focus of thermodynamic models. With more fundamental models being developed, this focus is shifting to account for more nuanced equilibria problems as well as the development of more well-rounded modelling approaches. This work proposes a new state of the art thermodynamic model, where a more holistic predictive approach is successfully demonstrated, and the subtle effect of structural isomerism in polar molecules is specifically addressed, with superior results in evidence compared to model contemporaries.

Supervisor: Prof A Burger

Co-supervisor: Prof CE Schwarz

DIRKSE VAN SCHALKWYK, Theunis Gysbert (Industrial Engineering)

A techno-economic and pricing strategy simulation model of multiple manufacturing companies supplying micromilling

New technology and rapid changes in markets require timely and informed decisions by businesses. Simultaneously, business risks must be considered. Microparts, especially in medical sectors, show a growing and profitable market. A model was programmed to simulate risks versus opportunities for new entrants to this market. Using a simulation model more completely identifies the probable outcomes, but also shows that the future is not deterministic. The initial market size, required minimum rates of return, growth rates of the markets, pricing strategies and number of competing companies in the market, will have the greatest impact on the choice of investing.

Supervisor: Prof AF van der Merwe

Co-supervisor: Prof D Dimitrov

GETAHUN, Samuel (Mechanical Engineering)

Investigating cooling performance and energy utilisation of refrigerated shipping container packed with fresh fruit using computational fluid dynamics modelling

In this dissertation, a computational fluid dynamics model that is capable of predicting airflow distribution and the energy consumption of a fresh fruit refrigerated shipping container was developed and validated. The experimentally validated model was used to evaluate operational and design parameters that affect cooling operation and energy utilisation during fresh fruit transportation. The results revealed the significance of container-operational and design parameters in maintaining the cold chain and reducing energy wastage. The research approach provides a valuable framework for analysing the cooling performance of a wide range of horticultural products and refrigerated transport.

Supervisor: Prof CJ Meyer

Co-supervisor: Prof UL Opara

GOODENOUGH, John Lloyd (Mechanical Engineering)

The effects of paint-based protective films on the actual temporal water-side performance characteristics of steam surface condenser tubes

Paint-based protective films (PPFs) are applied to the internal surface of steam surface condenser tubes to mitigate corrosion and erosion, thereby extending condenser life. The candidate has designed, built and

operated a portable test facility at a power plant, to experimentally measure the fouling performance characteristics of these films. Tests were performed over 185 days on several tube alloys with and without PPFs. This work has led to better understanding of the temporal fouling behaviour of PPFs and the significant negative impact of bio-fouling on electric power output. Implementation of the findings measurably reduces negative environmental impact.

Supervisor: Prof HCR Reuter

Co-supervisor: Dr MTF Owen

HELLER, Lukas Justin (Mechanical Engineering)

Development of a dual-pressure air receiver system for the SUNDISC cycle

Combined cycle concentrating solar power plants with solarised gas turbines have the potential to generate dispatchable electricity at a high efficiency. The SUNDISC cycle has been proposed to overcome shortcomings by adding an additional, non-pressurised air receiver that directly charges the storage. In this dissertation, the techno-economic performance of a SUNDISC cycle plant was shown. Additionally, the feasibility of a hybrid pressurised/non-pressurised air receiver system was investigated for the cycle. The basic concept was shown to not satisfy the demand in terms of efficiency and outlet temperature. However, proposed enhancements are expected to improve the concept's performance.

Supervisor: Dr JE Hoffmann

ISINGIZWE NTURAMBIRWE, Jean Frederic (Electronic Engineering)

Advances in spectral techniques for fruit quality evaluation: case of ULF-NMR and NIR

Low-cost, user-friendly devices for non-destructive quality testing are an increasing attraction for the food and agro-industry. Many criteria dictate that developmental trends place emphasis on developing dedicated calibrations in addition to hardware and software designs. Perceived as the most influential spectroscopies, SQUID-NMR relaxometry and FT-NIR were investigated for advanced, more effective methods in horticultural applications. Single- and multicomponent longitudinal NMR relaxometry were found to be an effective non-destructive tool at SQUID-detected micro-Tesla fields. A framework that alleviated NIR calibration transfer issues was provided. Genetic algorithm optimisation techniques revealed new fruit-cultivar-related dependencies and enhanced prediction performance.

Supervisor: Prof WJ Perold

Co-supervisor: Prof UL Opara

KATZ, Bernard Rael (Industrial Engineering)

Alignment of internal and external business and innovation domains

At the heart of this dissertation lies the idea that change is the new competitive advantage, innovation is the pinnacle of change, strategy is required to optimise innovation and alignment drives the successful implementation of strategy. Instead of being really good at doing some particular things, companies must be really good at learning how to do new things. In recent times the role and importance of an innovation strategy has come to the fore. This study introduces an innovation strategic alignment model (iSAM) which focuses on the alignment of a company's innovation and business domains.

Supervisor: Prof N du Preez

Co-supervisor: Dr L Louw

LANDMAN, Willem Adolph (Mechanical Engineering)

Optical performance of the reflective surface profile of a heliostat

Micro gas turbine central receiver systems offer advantages which could improve the techno-economic viability of the next generation of concentrating solar power plants. This dissertation investigates the optimal optical configurations of this relatively young technology. A fundamental study of heliostat optics identifies principal optical components and develops methods to more accurately and efficiently describe the flux distribution of a heliostat beam. The methods are applied in a techno-economic sensitivity study which indicates that the technology has alternative parameter sensitivities to conventional systems. The collective findings suggest that small heliostats offer a significant optical performance advantage which may lead to a lower levelised cost of energy.

Supervisor: Prof F Dinter

Co-supervisor: Dr P Gauché

LAUBSCHER, Ryno (Mechanical Engineering)

Utilisation of artificial neural networks to resolve chemical kinetics in turbulent fine structures of an advanced CFD combustion model

The research entailed the development and testing of a novel chemical kinetics integrator which uses artificial neural networks to predict incremental species mass fraction changes occurring in the turbulent fine structures of a flame. The goal was to reduce the computational resources required to solve advanced gas phase turbulent combustion numerical flow simulations. A novel neural network predictive model is developed, implemented and tested on a well published experimental setup, of a fully turbulent piloted jet diffusion flame of methane and air. The novel technique generated results with comparable accuracy to the experimental measurements at a significant computational cost reduction of 250–600%.

Supervisor: Dr JE Hoffmann

LINDNER, Berndt Gerald (Industrial Engineering)

Bi-objective generator maintenance scheduling for a national power utility

The generator maintenance scheduling (GMS) problem involves finding a schedule according to which planned maintenance can be performed on the generating units of a power system. A novel bi-objective optimisation model is proposed in this study for the GMS problem in which trade-offs are pursued between the maximisation of demand satisfaction reliability and the minimisation of electricity production cost. The model is solved by dominance-based bi-objective simulated annealing. A sensitivity analysis is performed in respect of various model constraint relaxations and the degree of constraint violations. The model and solution methodology is finally implemented in a user-friendly computerised decision support system so as to render the GMS solution approach easily accessible to non-mathematically inclined decision makers.

Supervisor: Prof JH van Vuuren

LUBKOLL, Matti (Mechanical Engineering)

Performance characteristics of the spiky central receiver air pre-heater (SCRAP)

Solar receivers such as the spiky central receiver air pre-heater (SCRAP) are important components of combined cycle concentrating solar power plants which provide the ability to deliver electrical power on demand through built-in thermal energy storage. The potential of the novel SCRAP technology was evaluated by developing analytical and computational models to enable performance prediction. The computer models were validated against results from an experimental test setup developed and built for this purpose. The SCRAP receiver was shown to equal or exceed current technologies in terms of solar-thermal efficiency as well as the system pressure drop across it.

Supervisor: Prof TW von Backström

Co-supervisor: Prof TM Harms

MUCHUKA, Nicasio Maguu (Electronic Engineering)

Hardware description language modelling and synthesis of superconducting digital circuits

Superconducting digital circuit design and synthesis tools lack the maturity of semiconductor counterparts. In this work, hardware description language (HDL) models were developed for rapid single flux quantum (RSFQ) and adiabatic quantum flux parametron (AQFP) circuit families. Bias voltage-dependent timing delays of gates were extracted, and mathematical models developed to include these delays in HDL models. A synthesis technique was proposed to create RSFQ circuits from HDL descriptions and demonstrated on adder circuits with width up to 64 bits. This work makes it easier for logic circuit designers with little or no experience of superconducting electronics to design such circuits.

Supervisor: Prof C Fourie

MUNRO, Dirk Pieter (Mechanical Engineering)

A direct approach to structural topology optimisation

Topology optimisation is a mathematical method devised to calculate the optimal material distribution for a predefined design scenario. The 'direct approach' is developed in a conventional structural optimisation framework, based on traditional sequential convex programming techniques. However, unlike conventional methods, the problem is solved in such a way that equilibrium is only satisfied at convergence of the optimisation procedure. This decoupling permits displacements and stresses in regions of void material to take on arbitrary values, thereby circumventing the infamous stress singularity problem. The computational burden associated with the sensitivity analysis of local state-based constraints reduces to manipulating simple partial derivatives.

Supervisor: Prof A Groenwold

PHIRI, Temwani Joshua (Electronic Engineering)

Characterising the electromagnetic environment of MeerKAT

MeerKAT, the 64-dish Square Kilometer Array (SKA) precursor radio telescope, is currently under construction in the Karoo. As a new generation instrument, it is far more susceptible to radio frequency

interference (RFI) than its predecessors. Reliable electromagnetic propagation modelling tools are required to fully characterise the environment. Existing tools were developed years ago for other applications (e.g. TV transmission). This work has carefully evaluated the existing propagation standards, using measured data from the Karoo site. New work using computational electromagnetics has allowed detailed simulation of the MeerKAT core. One of the important results is that the traditional free-space loss approximation for short range propagation is frequently unreliable here.

Supervisor: Prof DB Davidson

Co-supervisor: Dr PG Wiid

SCHONKEN, Willem Petrus Francois (Electronic Engineering)

Modelling and mitigation of specular multipath interference in a dual-frequency phase comparison FMCW radar system

Increased processing power, cheaper memory and higher sampling rates have enabled the application of frequency-modulated continuous wave (FMCW) radar to a myriad of new areas. This study derived a rigorous mathematical model of both the physical multipath environment and the two-dimensional fast Fourier transform signal processing method, in the context of a dual-frequency phase-comparison FMCW radar sensor. It was shown that specular reflections can have a profound effect on the amplitude and the phase of an FMCW radar's base-band received signals. Furthermore, new mitigation methods were proposed and critically evaluated by means of simulated and real-world measurements.

Supervisor: Prof JB de Swardt

Co-supervisor: Dr P van der Merwe

SHEIKH, Sajid Mubashir (Electrical Engineering)

Scheduling strategies to improve quality of service for heterogeneous data over resource-constrained wireless mesh networks

Multi-hop wireless mesh networks (WMNs) experience poor quality of service (QoS) in terms of high data packet losses under the MAC layer strategy carrier sense multiple access with collision avoidance. QoS is improved through a novel schedule-before contention (SBC) approach. Their performance in hybrid and homogeneous networks is investigated via extensive simulation techniques developed. A novel analytical model for predicting end-to-end delay for SBC strategies in multi-hop networks was also developed to verify the simulated network performance. This work provides guidelines and scheduling strategies for resource-constrained WMNs carrying heterogeneous traffic, which are particularly important for resource-limited remote distributed networks.

Supervisor: Dr HA Engelbrecht

Co-supervisor: Dr R Wolhuter

TAULO, John Terrence Loti (Mechanical Engineering)

A multi-objective optimisation tool for the Malawian tea industry with sustainability considerations

Corporate social responsibility is fast becoming imperative for corporate governance in industry and business worldwide and is assuming an increasing role in the general discourse on globalisation and sustainable development. The major challenge, however, is that there are

currently no standardised modalities by which it should be achieved nor a yardstick by which compliance can be graded. A tool to support this objective has been proposed, designed and empirically tested on a case study of three tea companies in Malawi. The results obtained show that the tool is a viable alternative to solve multi-objective optimisation problems in the tea industry.

Supervisor: Prof B Sebitosi

Co-supervisor: Prof A Groenwold

UHEIDA, Emad Harari (Industrial Engineering)

Development and optimisation of incremental sheet forming of titanium grade 2 – process mapping

Characteristics of titanium alloys make it possible to reduce the application's structural weight and increase its performance with thin-wall designs. Incremental sheet forming allows efficient manufacturing of small part batches. By abandoning the shape memory degree of the forming tool and by realising the component geometry using suitable tool kinematics, significant cost reductions can be achieved. In this study, the region of the incremental sheet forming process-variable space, where successful forming of the grade 2 titanium can be anticipated, is identified throughout a process-mapping approach. The

established map will enable the development of resource efficient forming process-chains for titanium sheets.

Supervisor: Dr T Oosthuizen

Co-supervisor: Prof D Dimitrov

DEng

PEROLD, Willem Jacobus (Electronic Engineering)

Superconducting devices and nanosensors

This dissertation is a narrative of a research career spanning 34 years. Initially the focus was on software for high-voltage and microwave diode design. The focus shifted to high-speed superconducting devices and during a sabbatical at UC Berkeley superconducting circuits were developed and tested at 18 GHz, still the fastest voltage-state circuits on the planet. A device fabrication laboratory was established at Stellenbosch, where innovative Josephson junction fabrication techniques, such as laser-etching and AFM scratching were developed. Current research is focused on the development of nanotechnology point-of-care biosensors for rapid detection of bacterial and viral infections, such as TB and HIV.

Supervisor: Prof P Meyer

ANDER KWALIFIKASIES OTHER QUALIFICATIONS EZINYE IZINGQINI-MFUNDO

Fakulteit Teologie

Faculty of Theology

IFakhalthi yezeNkolo

BACCALAUREUS IN DIE TEOLOGIE (BTh)

BACHELOR OF THEOLOGY (BTh)

BARRY, Chanté Chelsea

ESTERHUIZEN, Werner Hugo

JOKA, Thando

KIM, Jean-One

MATHEBULA, Sindiswa Andiswa Prudence

PRESENT, Prudence Melanie

BACCALAUREUS DIVINITATIS (BDiv)

BACHELOR OF DIVINITY (BDiv)

BLORO, Zukile

MANABILE, Madimetsa Nelson

NAGRAADSE DIPLOMA IN TEOLOGIE

(NGDip (Teologie))

POSTGRADUATE DIPLOMA IN THEOLOGY

(PGDip (Theol))

BRAND, Rode

DAVID, Teresa Chateaia

MKIZE, Sandile

SEPTEMBER, Bianca

SEWAPA, Tebogo Molate

TITUS, Hailton Jones

NAGRAADSE DIPLOMA IN TEOLOGIE CUM LAUDE

(NGDip (Teologie) CUM LAUDE)

POSTGRADUATE DIPLOMA IN THEOLOGY

CUM LAUDE (PGDip (Theol) CUM LAUDE)

DORA, Tihitina Telemos

MASHALABA, Gringoe Thandile

MAGISTER IN DIE TEOLOGIE (MTh)

MASTER OF THEOLOGY (MTh)

ADONIS, Melany Marildia (Praktiese Teologie)

ANTHONY, Ishaya (Praktiese Teologie)

BEZUIDENHOUT, Johannes Marthinus (Praktiese Teologie:

Bedieningspraktyk)

BOONZAAIER, Michelle Rose (Praktiese Teologie)

BOTHA, Bianca (Ekklesiologie)

CHILONGOZI, Mwawi (Praktiese Teologie)

DIPPENAAR, Elaine (Ou Testament)

DOMBONG, John Nancwat (Missiologie)

HENRY, Neil (Praktiese Teologie: Bedieningspraktyk)

JANSE VAN VUREN, Johanna Isabella (Praktiese Teologie: Kliniese

Pastoraat)

KOORDOM, Donovan (Ou Testament)

LEE, Shin-Hyo (Praktiese Teologie)

MENTOR, Henry Raymond (Praktiese Teologie: Bedieningspraktyk)

THABEDE, Slindile Brilliant (Ou Testament)

VAN WYK, Attie (Praktiese Teologie)

ZEELIE, Stefan (Praktiese Teologie: Bedieningspraktyk)

**MAGISTER IN DIE TEOLOGIE CUM LAUDE
(MTh CUM LAUDE)**

**MASTER OF THEOLOGY CUM LAUDE
(MTh CUM LAUDE)**

HENDRIKS, Nathania (Praktiese Teologie)
KHOSA, Thomas (Praktiese Teologie: Bedieningspraktyk)
KIM, Kijoong (Sistematiese Teologie)
KOO, Bonsam (Ou Testament)
PRETORIUS, Richard Matthew (Sistematiese Teologie)
RUARK, Joel David (Ou Testament)
STOMS, Jay Nixon (Praktiese Teologie)
THERON, Marinus Cronje (Praktiese Teologie: Bedieningspraktyk)

**MAGISTER DIVINITATIS CUM LAUDE
(MDiv CUM LAUDE)**

MASTER OF DIVINITY CUM LAUDE (MDiv CUM LAUDE)
BESTER, Lourens Christoph (Kerklike Bediening)

Fakulteit Ingenieurswese

Faculty of Engineering

IFakhalthi yezobuNjineli

BACCALAUREUS IN DIE INGENIEURSWESE (BIng)

BACHELOR OF ENGINEERING (BEng)

AGENBAG, Gert Andries (Bedryfsingenieurswese)
BADENHORST, Ivan Petrus (Bedryfsingenieurswese)
BAILIE, Malcolm Theodore (Chemies)
BAMPORIKI, Toussaint (Bedryfsingenieurswese)
BARNARD, Johannes Jacobus (Bedryfsingenieurswese)
BASSON, Lourens Johannes Smith (Siviel)
BEHNKEN, Caitlin Taylor (Bedryfsingenieurswese)
BEZUIDENHOUT, Leri (Bedryfsingenieurswese)
BOOYENS, Ayan (Megatronies)
BOTHA, Ruan Theron (Bedryfsingenieurswese)
BUTHELEZI, Nokubonga Patience (Siviel)
CHIWAWA, Maxwell (Chemies)
COETZEE, Rossouw Ernst (Meganies)
COETZEE, Willem Petrus (Elektries en Elektronies)
COULSON, Nicholas Trevor Gerhard (Megatronies)
DANIELS, Abdullah (Siviel)
DARLEY WADDILOVE, Douglas Mark (Siviel)
DE JAGER, Dirk Jacobus Adriaan (Siviel)
DE VILLIERS, Barend Fredrik (Bedryfsingenieurswese)
DE VILLIERS, Ignatius Thomas (Elektries en Elektronies)
DE VILLIERS, Shaun (Elektries en Elektronies)
DURAND, Thomas Gerhardus (Elektries en Elektronies)
EBRAHIM, Deen (Meganies)
EGGERT, Andreas (Elektries en Elektronies)
ESTERHUYSE, Hendrik Grunder (Bedryfsingenieurswese)
EVANS, Rami (Siviel)
GORDIJN, Mark Robert (Megatronies)
GOUWS, Gert (Siviel)
GRAY, Christopher Patrick (Megatronies)
HENNING, Mieke (Bedryfsingenieurswese)
JAN, Muaz Ahmad (Meganies)

JANOODIEN, Zaid (Siviel)
KAGELER, Peter Graham (Megatronies)
KNOLL, De-Wet (Bedryfsingenieurswese)
KOOPMAN, Vincenzo Finlo Dack (Siviel)
LAKE, Kathryn (Chemies)
LEE, Timothy Reay (Bedryfsingenieurswese)
LLOYD, Alexander Michael (Megatronies)
MALINDI, Portia Tlaleng (Meganies)
MALLOY, Ian Martin (Chemies)
MASWANGANYI, Musa Ndzalama (Megatronies)
MENEZIES, Ryan Grant (Meganies)
MOHALI, Whelan Sergio (Megatronies)
MOYCE, Shane Alexander (Elektries en Elektronies)
MYNHARDT, Marcelle (Chemies)
MYNHARDT, Trinkla-Marie (Bedryfsingenieurswese)
NEL, Christian Pascal (Megatronies)
NELL, Andrew Steven (Megatronies)
NYATHI, Welcome (Elektries en Elektronies)
OBERHOLZER, Johannes Francois (Bedryfsingenieurswese)
OLIVIER, Anro Malan (Meganies)
PETERSON, Bjorn Sven (Bedryfsingenieurswese)
PICKARD, Johann Louis (Chemies)
RIPUNDA, Cheronline (Elektries en Elektronies)
RIST, Inge Monique (Chemies)
ROHRBECK, Alicia (Siviel)
ROUX, Pieter Gerhardus (Meganies)
SAAL, Luigi Amre (Siviel)
SALMON, Sherene Juandre (Elektries en Elektronies)
SCHOLLE, Paulo (Bedryfsingenieurswese)
SCHWARTZ, Michael (Meganies)
SITHOLE, Tinashe Blessing (Siviel)
SMITH, Hermanus (Siviel)
STEYN, Andre Joshua (Megatronies)
STOFBERG, Jacobus du Toit (Meganies)
TALJAARD, Jacques (Bedryfsingenieurswese)
TEIXEIRA, Antonio Juan-Luc (Megatronies)
TESTA, Misha (Bedryfsingenieurswese)
THERON, Johannes Petrus (Siviel)
THERON, Pieter Francois (Bedryfsingenieurswese)
THOMSON, Dane Neil (Siviel)
VAN AS, George Christiaan (Bedryfsingenieurswese)
VAN ASWEGEN, Lourens Andries Stephanus (Meganies)
VAN DER MERWE, Nicolaas Meiring (Megatronies)
VAN EEDEN, Christo (Megatronies)
VAN EEDEN, Renier Marcel (Meganies)
VAN HEERDEN, Hanlie (Bedryfsingenieurswese)
VAN JAARVELD, Suandri (Bedryfsingenieurswese)
VAN NIEKERK, Jacques (Meganies)
VAN ZANTEN, Alwyn Johan (Bedryfsingenieurswese)
VERSFELD, Ryno (Meganies)
VERSTER, Jake Sean (Meganies)
WALSH, Gerard Louis (Meganies)
WALTERS, Marisa (Bedryfsingenieurswese)
WEAVER, Michael John Samuel (Bedryfsingenieurswese)
WEBBER, Kate (Bedryfsingenieurswese)
WILKENS, Jan (Bedryfsingenieurswese)
WOLFAARDT, Johannes Cornelius (Bedryfsingenieurswese)

**BACCALAUREUS IN DIE INGENIEURSWESE
CUM LAUDE (BIng CUM LAUDE)**

**BACHELOR OF ENGINEERING CUM LAUDE
(BEng CUM LAUDE)**

NEL, Gerrit Stephanus (Bedryfsingenieurswese)

**NAGRAADSE DIPLOMA IN INGENIEURSBESTUUR
(NGDip (Ingbest))**

**POSTGRADUATE DIPLOMA IN ENGINEERING
MANAGEMENT (PGDip (Eng Management))**

FAKIER, Yacoob

**NAGRAADSE DIPLOMA IN DIE INGENIEURSWESE
(NGDip (Ingwese))**

**POSTGRADUATE DIPLOMA IN ENGINEERING
(PGDip (Engineering))**

LAGARDIEN, Naajidah

SCHURER, Maximilian Juan

MAGISTER IN DIE INGENIEURSWESE (MIng)

MASTER OF ENGINEERING (MEng)

ASQUITH, Joshua Steven (Chemiese ingenieurswese)

BARRY, Reginald Murray (Meganiese Ingenieurswese)

BOCK, Heinrich (Chemiese Ingenieurswese)

BOTHA, Bettina Elizabeth (Siviele Ingenieurswese)

BRINK, Johan Christopher (Siviele Ingenieurswese)

BRINK, Michael Phillippus (Bedryfsingenieurswese)

BWEMBYA, Emmanuel Mutale (Meganiese Ingenieurswese)

COETZEE, Jacobus Stephanus (Megatroniese Ingenieurswese)

COOMANS, Cornelius Johannes (Chemiese Ingenieurswese)

CORBETT, John-Henry (Megatroniese Ingenieurswese)

DEACON, Matthew Marc (Megatroniese Ingenieurswese)

DEELIE, Malcolm (Chemiese Ingenieurswese)

DELPORT, Lourens Daniel (Bedryfsingenieurswese)

EBRAHIM, Nuraan (Siviele Ingenieurswese)

ELLIS, David Rostin (Meganiese Ingenieurswese)

GIRDWOOD, Richard David (Bedryfsingenieurswese)

GOVA, Webster (Bedryfsingenieurswese)

GRAAFF, André Hendri (Meganiese Ingenieurswese)

GREEFF, Anton (Ingenieursbestuur)

GREYLING, Nanette (Chemiese Ingenieurswese)

GURA, Liberty (Chemiese Ingenieurswese)

HAGEDORN-HANSEN, Devon (Bedryfsingenieurswese)

HAVENGA, Pieter-Jan (Meganiese Ingenieurswese)

HAY, Michael Rhys (Siviele Ingenieurswese)

HENNING, Lizan (Bedryfsingenieurswese)

HERBST, Willem Jacobus (Chemiese Ingenieurswese)

HOKWANA, Anathi (Elektroniese Ingenieurswese)

HORN, Bartholomeus van Wyk (Elektriese Ingenieurswese)

JANSE VAN RENSBURG, Cornelius Johannes Theodorus (Siviele Ingenieurswese)

JIVAN, Shaneel (Meganiese Ingenieurswese)

JONES, Ian Courtney Fraser (Siviele Ingenieurswese)

KOCK, Macaera Preston (Meganiese Ingenieurswese)

KRIEL, Aadil (Siviele Ingenieurswese)

KRUGER, Anria (Megatroniese Ingenieurswese)

LEMMER, Kyle Duane (Ingenieursbestuur)

LOMBARD, Charles Henry Ochse (Meganiese Ingenieurswese)

MALINDA, Moses Joseph Kelvin (Siviele Ingenieurswese)

MANYELE, George (Siviele Ingenieurswese)

MARAIS, Jeannette (Meganiese Ingenieurswese)

MAREE, Patsy (Chemiese Ingenieurswese)

MAYBERY, Vernon Gregory Coyle (Siviele Ingenieurswese)

MBUKANI, Mwana Wa Kalaga (Elektriese Ingenieurswese)

MDZINISO, Brian Mercedes Mfundo (Siviele Ingenieurswese)

MERTS, Andre Jan (Elektroniese Ingenieurswese)

METCALF, Graham James (Chemiese Ingenieurswese)

MICHAU, Nicola (Bedryfsingenieurswese)

MKHALIPHI, Sandile Patrick (Elektroniese Ingenieurswese)

MKULISI, Sizwe Honest (Siviele Ingenieurswese)

MÜLLER, Regardt Ignatius (Elektroniese Ingenieurswese)

MULOL, Christian A-Nawej (Siviele Ingenieurswese)

NICKERSON, Brendon Mark (Meganiese Ingenieurswese)

NOLTE, Armand Louis (Megatroniese Ingenieurswese)

OLISH, Akas Dany (Siviele Ingenieurswese)

OLIVIER, Zen-Mari (Bedryfsingenieurswese)

PARUK, Haroon (Siviele Ingenieurswese)

PIUS, Moses Tuutaleni (Chemiese Ingenieurswese)

RAATS, Wernich (Elektroniese Ingenieurswese)

ROKITA, Piotr (Ingenieursbestuur)

SCHMITTINGER, Elianne (Meganiese Ingenieurswese)

SCHOLTZ, Carl (Siviele Ingenieurswese)

SKLAR-CHIK, Mark David (Bedryfsingenieurswese)

SMIT, Francis Viviers (Meganiese Ingenieurswese)

SMIT, Jason (Chemiese ingenieurswese)

STEENKAMP, Lukas Petrus (Bedryfsingenieurswese)

STRASHEIM, Emile Albert (Bedryfsingenieurswese)

TALJAARD, Henning Jacques (Siviele Ingenieurswese)

TAWINE, James Frans (Siviele Ingenieurswese)

TREDOUX, Nichilis (Siviele Ingenieurswese)

VAN DER MERWE, Carel Andries (Elektroniese Ingenieurswese)

VAN DER MERWE, Colette (Siviele Ingenieurswese)

VAN DER MERWE, Frans Hendrik (Siviele Ingenieurswese)

VAN EEDEN, Frans (Siviele Ingenieurswese)

VERNOOY, Carla (Ingenieursbestuur)

VILJOEN, Quintin (Siviele Ingenieurswese)

VISSER, Hermanus Johannes (Siviele Ingenieurswese)

WESSON, Heinrich (Elektroniese Ingenieurswese)

WILSON, Nathan (Bedryfsingenieurswese)

ZHENG, Andrew Xhiao (Megatroniese Ingenieurswese)

ZHUWAKI, Nigel Tatenda (Ingenieursbestuur)

**MAGISTER IN DIE INGENIEURSWESE CUM LAUDE
(MIng CUM LAUDE)**

**MASTER OF ENGINEERING CUM LAUDE
(MEng CUM LAUDE)**

ABRAHAMS, Taneha Mae (Meganiese Ingenieurswese)

ALBERTYN, Pierre Wouter (Ekstraktiewe Metallurgiese Ingenieurswese)

AUCAMP, Herman (Siviele Ingenieurswese)

AZANKPO, Severin (Meganiese Ingenieurswese)

BESTER, Hermanus Lambertus (Siviele Ingenieurswese)

BOTHA, Frederick Jacobus (Elektroniese Ingenieurswese)

BOTHA, Gert Hendrik Renier (Elektroniese Ingenieurswese)

BOTHA, Louisa (Ingenieursbestuur)
BRONKHORST, SJ (Siviele Ingenieurswese)
BRUWER, Frederick Johannes (Elektroniese Ingenieurswese)
BURGER, Leon (Chemiese ingenieurswese)
CHIU, Alexander (Elektroniese Ingenieurswese)
CLOETE, Andrew Hector (Elektroniese Ingenieurswese)
CUPERUS, Jacobus Louwrens (Meganiese Ingenieurswese)
DALL, Ernest Peter (Meganiese Ingenieurswese)
DE BEER, Mourits (Elektriese Ingenieurswese)
DE BRUIN, Andrew (Elektroniese Ingenieurswese)
DE WAAL, Rosca Johan Oscar (Meganiese Ingenieurswese)
DRENNAN, Michael Bryan (Siviele Ingenieurswese)
DU PLESSIS, Armand André (Elektriese Ingenieurswese)
DU PLESSIS, Carl (Bedryfsingenieurswese)
ERASMUS, Abram Stephanus (Elektriese Ingenieurswese)
FOURIE, Johannes (Siviele Ingenieurswese)
GELDENHUYS, Heinrich Jacques (Ingenieursbestuur)
GRIEBENOW, Margaretha Aletta (Siviele Ingenieurswese)
GROBBELAAR, Eben (Meganiese Ingenieurswese)
GWARA, Batsirai (Siviele Ingenieurswese)
HUGO, Gideon Lambertus (Elektroniese Ingenieurswese)
IOPPO, Piero Graziano (Elektroniese Ingenieurswese)
JOUBERT, Christiaan Johannes (Elektriese Ingenieurswese)
KRUGER, Ingé Christine (Bedryfsingenieurswese)
LAMPRECHT, Johannes Hendrik (Chemiese ingenieurswese)
LATEGAN, Luca (Elektriese Ingenieurswese)
LINGERVELDER, Deon (Bedryfsingenieurswese)
LÖTTER, Janneke (Bedryfsingenieurswese)
LOUW, Joachim Paul (Siviele Ingenieurswese)

MALAN, Pieter Jacobus (Elektroniese Ingenieurswese)
MATTHEE, Alexander (Elektriese Ingenieurswese)
MITCHELL, Joshua Cole (Elektriese Ingenieurswese)
NEL, Christiaan Ludolph Marais (Siviele Ingenieurswese)
NEMVUMONI, Fhatuwani Lesley (Siviele Ingenieurswese)
O'BRIEN, Jessica Edwina (Meganiese Ingenieurswese)
OBERHOLZER, Adelaide Emily (Elektroniese Ingenieurswese)
OOSTHUIZEN, Ann Cornelia (Bedryfsingenieurswese)
OOSTHUIZEN, Chiara (Ingenieursbestuur)
PIDAPARTHI, Arvind Sastry (Meganiese Ingenieurswese)
PETERS, Christian Dietrich (Meganiese Ingenieurswese)
POOLE, Ian Vincent (Meganiese Ingenieurswese)
SMITH, Sonja Almi Milé (Chemiese ingenieurswese)
STELZNER, Samuel George Eric (Bedryfsingenieurswese)
SWART, Benjamin Dawid (Elektriese Ingenieurswese)
SWART, Jasmin (Chemiese ingenieurswese)
TREURNICHT, Anton (Elektroniese Ingenieurswese)
VAN JAARSVELDT, Willem Johannes (Siviele Ingenieurswese)
VAN SCHALKWYK, Derrick (Siviele Ingenieurswese)
VAN TONDER, Geomarr (Elektroniese Ingenieurswese)
VAN ZYL, Hermanus Jacobus (Ingenieursbestuur)
VORSTER, Rianco (Siviele Ingenieurswese)

**MAGISTER IN DIE NATUURWETENSKAPPE IN
INGENIEURSWESE (MScIng)**

MASTER OF SCIENCE IN ENGINEERING (MScEng)

LEBOTSA, Phalane Sekina (Elektroniese Ingenieurswese)
VAN VELDEN, Wouter (Siviele Ingenieurswese)