RESEARCH PRODUCTIVITY 2020

Book and Book Chapter


Keynote Address, Tutorial and Invited Presentations


DHET Accredited Journal Articles


Non-DHET Accredited Journal Articles


Peer-Refereed Conference Proceedings


Other Research Output: Non-Peer Reviewed Conference Proceedings


Higher Degrees Graduated

Master of Engineering

Nkonyane, Mfanansibili Stanley, B.Tech, Electrical Engineering
Supervisor: Dr E E Ojo and Dr B Rigby.

Gwatidzo, Ngoni, B.Tech Electrical Engineering
Supervisor: Prof IE Davidson

Thakoordeen, R.R., B.Tech, Electrical Engineering
Dissertation: An Investigation into the Alternative Energy Solutions to Power Desalination Plants and the Storage of Energy using Graphene Supercapacitors Generated from Renewable Sources.
Supervisor: Dr. E.E. Ojo

Tshikomba, Salome Busisiwe Jiyane, B.Tech BSc (Hons) Electrical Engineering
Supervisor: Prof IE Davidson and Dr E.E. Ojo

Higher Degrees Graduated in other Institutions (UKZN)

Doctor of Philosophy (2020)

Singh, Hariram, BScEng, MScEng (UKZN) Electrical Engineering
Dissertation: Utilisation of Line Surge Arrestors to Improve Overhead EHV AC and DC Line Performance under Lightning Conditions
Supervisors: Professor IE Davidson

Master of Science in Engineering (2020)

Moodley, Denzil, BScEng (UKZN) Electrical Engineering
Dissertation: Evaluation of a Combined Heat and Power (CHP) Retrofit For Supplemental on-site Power Generation at ENGEN oil Refinery
Supervisor: Prof IE Davidson and Mr. K. Moodley
Higher Degrees under Examination

Doctor of Engineering

Gumede, Makhosonke, BTech, MEng, Electrical Engineering
Dissertation: The extraction of power and fresh water from the ocean off the coast of KZN utilizing ocean thermal energy conversion (OTEC) techniques (2015)
Supervisor: Prof P Naidoo and F. D’Almaine.

Buraimoh, Elutunji, BTech (LAUTECH), MScEng (OAU), Electrical Engineering
Supervisor: Prof IE Davidson

Master of Engineering

Leholo, Sempe, BTech, Electrical Engineering
Supervisor: Prof P A Owolawi and Mr. K.T. Akindeji

Sewnraain, Shikhar, BTech, Electrical Engineering
Supervisor: Dr. C. Onunka and Mr K.T. Akindeji

Joshi, Milan, BTech, Electrical Engineering
Dissertation: Load frequency control of a hydro dominating interconnected power system. (2019)
Supervisor: Dr G Sharma and Prof IE Davidson

Reddy, Rodney, BTech Electrical Engineering
Supervisor: Prof IE Davidson

Ndaba, Iren Sindi, BTech Electrical Engineering
Supervisor: Prof IE Davidson

Malanda, Sindisiwe Cindy, BTech, Electrical Engineering
Supervisor: Prof IE Davidson and Dr Grain Adam.

Chetty, Nelson, BTech, Electrical Engineering
Supervisor: Dr G Sharma and Prof IE Davidson

Masikane, Sboniso B, BTech, Electrical Engineering
Supervisor: Dr. G. Sharma and Mr. K.T. Akindeji
**Higher Degrees under Supervision**

**Doctor of Engineering**

**Adebiyi, Abayomi**, BEng (Hons), MEng, Electrical Engineering
Supervisor(s): Assoc. Professor I. Lazarus, Assoc. Professor A. Saha and **Dr E.E. Ojo**

**Dakora, Jonas Don-Yelee**, BTech (CPUT), MEng (DUT) Electrical Engineering
Supervisors: **Professor IE Davidson** and Dr C. Mulangu

**Akinyemi, Ayodeji Stephen**, OND, HND, PGD, MSc (UCT) Electrical Engineering
Dissertation: Voltage rise mitigation at the Point of Common Coupling (PCC) of Large Renewable Distributed Generation (RDG) and Distribution Network. (2019)
Supervisor(s): **Dr M. Kabeya** and **Prof IE Davidson**

**Madonsela, Bhekinkosi**, BTech MEng (DUT) Electrical Engineering
Supervisor: **Prof IE Davidson** and Dr C. Mulangu.

**Rampith, Viren**, BTech, MTech, Electrical Engineering
Supervisor: **Prof IE Davidson**

**Chetty, Vasudevan**, BTech, MScEng, Electrical Engineering
Dissertation: Planning a Smart High Voltage Power System to enabling a Smart City. (2020)
Supervisor: **Prof IE Davidson** and **Dr G Sharma**

**Kapidani, Nexhat**, BEng, MPhil, Electrical and Electronic Engineering
Dissertation: Intelligent use of maritime info-communication systems in developing environments. (2020)
Supervisor: Prof S. Bauk, Prof DS Ilcev and **Prof IE Davidson**

**Gwatidzo, Ngoni**, BTech, MEng, Electrical Engineering
Supervisor: **Prof IE Davidson**

**Doctor of Philosophy (UKZN)**

**Akindeji, Kayode Timothy**, BScEng, MScEng Electrical Engineering
Dissertation: Performance and Cost Benefit Analysis of University Campus Microgrid
Supervisors: Dr Remy Tiako and **Professor IE Davidson**
Master of Engineering

Loji, Nomhle, B Tech, Electrical Engineering
Dissertation: Evaluation of grid-scale battery energy storage system as an enabler of large-scale renewable energy integration (2017)
Supervisor: Prof IE Davidson and Mr. K.T. Akindeji

Goolam, Hoosen Nadneem, B Tech Electrical Engineering
Supervisor: Dr E.E. Ojo and Prof N.M. Ijumba

Nampoya, Crispin, B Tech, Electrical Engineering
Supervisor: Prof IE Davidson

Ntombela, Sibusiso Goodenough, B Tech, Electrical Engineering
Supervisor: Prof IE Davidson and Dr G Sharma

Khoza, Nkosinathi S E, B Tech, Electrical Engineering
Supervisor: Prof IE Davidson

Nsibande, Minenhle Errol, B Tech, Electrical Engineering
Supervisor: Prof IE Davidson

Mazibuko, Ntombenhle, B Tech, Electrical Engineering
Supervisor: Prof IE Davidson and Dr G Sharma

Khumalo, Nkosinathi Emmanuel, B Tech, Electrical Engineering
Dissertation: Optimal sizing and control of lithium-ion battery energy storage system to be used for maximum demand peak shaving, peak energy utilisation and peak energy export. (2018)
Supervisor: Prof IE Davidson

Ndlovu, Ntobeko, B Tech, Electrical Engineering
Supervisor: Prof IE Davidson

Lafeni, Sipho, B Tech, Electrical Engineering
Supervisor: Prof IE Davidson and Dr M Kabeya

Khumalo, Nkosinathi Emmanuel, B Tech, Electrical Engineering
Dissertation: Optimal sizing and control of lithium-ion battery energy storage system to be used for maximum demand peak shaving, peak energy utilisation and peak energy export. (2018)
Supervisor: Prof IE Davidson and Dr M. Kabeya

Zulu, Musawenkosi L, B Tech, Electrical Engineering
Supervisor: Dr E.E. Ojo

Bahara, R.K., B Tech, Electrical Engineering
Supervisor: Dr E.E. Ojo

Mtukushe, Namhla Faith, B Tech Electrical Engineering
Dissertation: The analytical study on the establishment of a tidal power plant in South Africa. (2019)
Supervisor: Dr E.E. Ojo

Mpana, Zukiswa, B Tech, Electrical Engineering
Supervisor: Prof IE Davidson and Dr Bruce Rigby

Shezi, Siphelele Brian, B Tech Electrical Engineering
Dissertation: The study of the upgrade and improvement of power electronics protection system for locomotives. (2019)
Supervisor: Dr E.E. Ojo

Moma, Christophe, B Tech Electrical Engineering
Dissertation: Modern power electronic technology for the grid integration of renewable energy sources. (2019)
Supervisor: Dr M. Kabeya and Prof IE Davidson

Mhlongo, Sanele P, B Tech, Electrical Engineering
Supervisor: Prof IE Davidson

Estrice, Milton, B Tech, Electrical Engineering
Dissertation: Investigating the mitigation technique of frequency control for load stability of interconnected power system. (2019)
Supervisor: Dr G. Sharma and Mr K.T. Akindeji

Ayar, Prenushka, B Tech Electrical Engineering
Dissertation: Investigation and Mitigation of Temporary Overvoltage caused by Filters, Correcting Harmonics Produced by Motor Drives. (2019)
Supervisor: Dr O. Akinrinde and Dr. E.E. Ojo

Hlatshwayo, Ntokozo Victor, B Tech, Electrical Engineering
Supervisor: Prof IE Davidson and Mr. Rathilall Sewsunker.

Pillay, Caleb Jordache, B Tech, Electrical Engineering
Supervisor: **Dr M. Kabeya** and **Prof IE Davidson**

**Nguefack, Louis, BTech, Electrical Engineering**
Supervisor: **Prof IE Davidson** and **Mr A. Adebiyi**

**Ntombela, Mlungisi Eric, BTech Electrical Engineering**
Dissertation: Algorithm for power losses and efficiency evaluation for power distribution systems. (2020)
Supervisor: **Dr M. Kabeya**

**Nel, Jacques J, BTech Electrical Engineering**
Dissertation: Designing off-grid hybrid renewable power generation system for rural electrification. (2020)
Supervisor: **Dr E.E. Ojo** and **Mr C. Leonake**

**Khumalo, Simanga Wonder, BTech Electrical Engineering**
Dissertation: Investigating the impact of induction motor starting techniques on power quality. (2020)
Supervisor: **Dr M. Kabeya** and **Dr B. Rigby**

**Buthelezi, Kwanelo M, BTech Electrical Engineering**
Supervisor: **Dr M. Kabeya** and **Dr B. Rigby**

**Magenuka, Kenneth Thand’uxolo K, BTech Electrical Engineering**
Dissertation: Kernel estimation modelling and optimization of hybrid power system for a typical South African rural area (2020).
Supervisor: **Dr M. Kabeya** and **Mr K.T. Akindeji**

**Mhaimbai, Nicky Kamwi, BTech, Electrical Engineering**
Supervisor: **Prof IE Davidson**

**Ndlela, Nomihla W, BTech, Electrical Engineering**
Supervisor: **Prof IE Davidson**

**Ntela, Simphiwe A, BTech, Electrical Engineering**
Supervisor: **Prof IE Davidson** and **Dr C Mulangu**

**Mtihiane, Surprise Bongani, BTech, Electrical Engineering**
Supervisor: **Prof IE Davidson** and **Mr E. Buraimoh**

**Mhlongo, Phumelele Bridgett, BTech, Electrical Engineering**
Supervisor: **Dr M. Kabeya** and **Mr E. Buraimoh**

**Mkhize, Mandisa Portia, BTech, Electrical Engineering**
Supervisor: Prof IE Davidson and Mr A.A. Adebii

Mulan, Steve Musans, BTech, Computer System Engineering
Dissertation: Optimal power sharing in a DC microgrid. (2020)
Supervisor: Dr N. Pillay, Prof IE Davidson and Mr. Rathilall Sewsunker.

Jiyane, Muziwenkosi, BTech, Electrical Engineering
Dissertation: Standalone DC microgrid energy optimization. (2020)
Supervisor: Prof IE Davidson and Mr. Rathilall Sewsunker.

Community Service Activities


[2] Conference Reviewer: Mr. K T Akindeji
- SAUPEC 2020

[3] Conference Reviewer: Professor IE Davidson
- South African Universities Power Engineering Conference/Robotics & Mechatronics/Pattern Recognition Association of SA (SAUPEC/RobMech/ PRASA)
- Clemson University Power System Engineering Conference.
- IEEE Power Africa 2020

- South African Universities Power Engineering Conference/Robotics & Mechatronics/Pattern Recognition Association of SA (SAUPEC/RobMech/ PRASA)

[5] Conference Reviewer: Dr M. Kabeya
- South African Universities Power Engineering Conference/Robotics & Mechatronics/Pattern Recognition Association of SA (SAUPEC/RobMech/ PRASA)

- International Journal of Renewable Energy Research (IJRER)

[7] Journal Reviewer: Professor IE Davidson
- IEEE Journal of Emerging and Selected Topics in Power Electronics
- IEEE Transactions (Power Delivery, Energy Conversion)
- IEEE Transactions (Power Electronics)
- IEEE Access
- Electric Power Systems Research Journal
- International Journal of Electrical Power and Energy Systems
- International Journal of Renewable Energy Research (IJRER)
- Frontiers in Energy
- Renewable Energy (Elsevier)
- Journal of Advanced Computational Intelligence and Intelligent Informatics (JACIII)
- Technology and Economics of Smart Grids and Sustainable Energy Journal
- Engineering Science and Technology: An International Journal
- International Journal of Green Energy
- International Journal of Ambient Energy
- Mathematical Problems in Engineering (Hindawi)

[8] Journal Reviewer: Dr M. Kabeya
- Energy Storage Journal

[9] Journal Reviewer: Dr G. Sharma
- Transactions on Electrical Energy System (Wiley)
- IEEE Transactions on Power System
- IET Generation Transmussion & Distribution
- Ain Shams Eng. Journal (Elsevier)
- International Journal of Emerging Electric Power Systems (De-Gruyter), International

- PhD, MSc Eng. Dissertation: University of KwaZulu-Natal.
- MEng Dissertation: Tshwane University of Technology.

- External examiner for Design Project III(MUT)

Research Grants
[1] Principal Investigator: Mr K.T. Akindeji: Eskom TESP Grant (Rural Rectification): R50 000.00
[2] Principal Investigator: Dr M. Kabeya: Eskom TESP Grant: R50 000.00
[3] Principal Investigator: Prof IE Davidson: Eskom TESP Grant (Smart Grids): R70 000.00
[4] Principal Investigator: Prof IE Davidson: Eskom TESP Grant (HVDC): R70 000.00
[5] Principal Investigator: Prof IE Davidson: Eskom TESP Grant (Centre for RTPPS): R70 000.00
[6] Project Leader / Principal Investigator: Prof IE Davidson: Research and Development Programmes in Space Science and Technology (Satellite Communication and Navigation), funded by the Department of Science and Technology (DST), South Africa. Project Grant: 2018 – 2019: R1 595 000.00
Honours, Awards and Recognitions

[1] **2020: Third Place for the Outstanding Conference Paper** - Received the *Third Place Outstanding Paper Award* for the technical paper: *E. Buraimoh* and *I.E. Davidson*, "Modelling and Assessment of the Fault Ride-Through Capabilities of Grid Supporting Inverter-Based Microgrids", Clemson University Power Systems Conference, March 10 - 13, Clemson, SC, USA, 2020


[3] **2020: Durban University of Technology Research Awards**