

Message from the Editorial Team

While South Africa has seen an influx of COVID-19 cases, we continue to urge everyone to take all necessary safety precautions in preventing the spread of the virus. Sunday, the 17th of May 2021, 1757 new cases were reported nationally. Thursday, the 20th of May 2021, 3641 new cases were recorded. This is an increase of 1884 new cases in 4 days. These statistics are a clear indication and warning to us all. Let us continue wearing masks, observe social distancing, avoid crowded spaces and always sanitise. The third wave is here with us in South Africa.

International Exchange Programme

The Chair of the Department of Electrical Power Engineering (EPE), Research Leader of the Centre of Excellence in Smart Grids, and Project Leader in DUT-DSI Space Science Centre, Prof. IE Davidson hosted two international Ph.D students to conduct their benchwork and experimental analysis in their respective research projects. The fundamental objective of **Engr. Abunike, Emmanuel Chiweta's** Doctoral thesis is the use of finite element technique to perform detailed analysis of switched reluctance motor. The intension is to improve the electromagnetic, thermal, and vibro-acoustic behaviour of the motor. **Engr. Anyanime Tim Umoette** conducted experimental studies on a 2.2kW 3-phase squirrel cage induction motor to validate the simulation results carried out on the induction motor. The objective of the experiments was to demonstrate the speed behavior of the machine under different loading condition.



From left to right: Engr. Emmanuel Chiweta Abunike, Prof. Innocent Davidson, Engr. Anyanime Tim Umoette (Photographer: Dr Elutunji Buraimoh)

Engr. Abunike, Emmanuel Chiweta (left) obtained the B.Eng and M.Eng degrees from the University of Nigeria Nsukka (UNN), Nigeria, and Michael Okpara University of Agriculture Umudike (MOUAU), Nigeria, in 2012 and 2017, respectively. He is currently a lecturer at the Department of Electrical and Electronic Engineering, MOUAU, Nigeria. He is a registered Ph.D. student at MOUAU, Nigeria. His thesis topic is “Finite element analysis of switched reluctance motor for enhanced performance”, under the supervision of Prof. Ogbonnaya Inya Okoro and Dr. Patrick Ifeanyi Obi. He completed his Ph.D. benchwork work at the Department of Electrical Power Engineering, Durban University of Technology, South Africa, under the supervision of Prof. IE Davidson, a Full Professor and Chair, EPE Department.

Engr. Anyanime Tim Umoette (right) is currently working in Akwa Ibom State University as an Academic staff and a Researcher. He obtained his first and second degrees in Electrical and Electronic Engineering from the University of PortHarcourt (Bachelor of Engineering (B.Eng.), and Masters of Engineering (M.Eng) from the University of Uyo, in Nigeria. He is presently doing his Ph.D. program in the Micheal Okpara University of Agriculture, Abia State, Nigeria, under the supervision of Prof. Ogbonnaya I. Okoro and Dr. Peter I. Obi. Benchwork on the Ph.D. project at Department of Electrical Power Engineering, Faculty of Engineering and Bult Environment at the Durban University of Technology in Durban, South Africa, under the supervision of Prof. Innocent E. Davidson. This initiative yielded joint-publications between DUT and Michael Okpara University of Agriculture, and advanced ENVISION2030 internationalization agenda of DUT Executive Management. Further collaborations and future exchange programs are in progress.

Research Grants

- [1] Principal Investigator/Research Leader: **Prof IE Davidson**: DSI-DUT Space Science Program: “Communications, Navigation & Surveillance and Navigation Systems (CNS) – Space Science Research”. Department of Science and Innovation, Republic of South Africa. Grant Amount: R3 204 750.00.
- [2] Co-Investigator: **Prof IE Davidson**: Royal Academy of Engineering, United Kingdom: “Enhancing the Role of Engineers in Translational Research and Entrepreneurship”, (2020-2021): Grant Amount: £200 000.00.
- [3] National Research Foundation Thuthuka Grant: **Dr. M Kabeya**: “Modern Power Electronics Technology for Grid Integration with Renewable Energy Sources”: Grant Amount: R150 000.00.
- [4] National Research Foundation Thuthuka Grant: **Mr Dwayne Reddy**: “Effects of Ion Doping on the Electron Transfer Layer of Perovskite Solar Cells”. (2021 – 2022): Grant Amount: R115 000.00.
- [5] Tertiary Education Support Program TESP Grant: **Dr. M Kabeya**: Grant Amount: R50 000.
- [6] Tertiary Education Support Program TESP Grant: **Mr. Akindeji**: Grant Amount: R90 000.
- [7] Tertiary Education Support Program TESP Grant: **Dr. Sharma** : Grant Amount: R50 000.
- [8] Tertiary Education Support Program TESP Grant: **Prof IE Davidson**: Grant Amount: R210 000.

Research Awards and Honors

- [1] Recipient of the award of “**Top Faculty Author**”, at the Durban University of Technology: **Prof IE Davidson** . 2020 DUT Annual Research Awards, Nov 2020.
- [2] Recipient of the award of “**Field Weighted Citation Impact (FWCI) Recognition**”, at the Durban University of Technology: **Dr. E Buraimoh**. 2020 DUT Annual Research Awards, Nov 2020.

Postgraduate Students Graduation

Degree of Doctor of Engineering

- [1] **Buraimoh, Elutunji**
Title of Thesis: *Modelling and Fault Ride-through of Grid Supporting Inverter-based Microgrid*
- [2] **Gumede, Makhosonke**
Title of Thesis: *The Extraction of Power and Fresh Water from the Ocean off the Coast KZN Utilizing Ocean Thermal Energy Conversion Techniques*

Degree of Master of Engineering

- [3] **Chetty, Dhanpal**
Title of Thesis: *Application of Optimal Control for Power Systems Considering Renewable Energy Technologies*
- [4] **Estrice, Milton Solomon**
Title of Thesis: *Design of Control Strategies for Frequency Regulation of PV-Thermal Interconnected Power System*
- [5] **Joshi, Milankumar Bharatbai**
Title of Thesis: *Load Frequency Control of a Hydro Dominating Interconnected Power System*
- [6] **Leholo, Sempe Thom**
Title of Thesis: *Modelling and Optimization of Hybrid Micro-grid System for LTE based Station*
- [7] **Malanda, Sindisiwe Cindy (Ms)**
Title of Thesis: *Transient Fault Analysis of a VSC-Based-Unit Multi-Terminal HVDC Scheme*
- [8] **Masikana, Sboniso Brutus**
Title of Thesis: *Voltage Stability in Distribution Network*
- [9] **Mtukushe, Namhla Faith (Ms)**
Title of Thesis: *The Analytical Study on the Establishment of a Tidal Power Plant in South Africa*
- [10] **Ndaba, Iren Sindi (Ms)**
Title of Thesis: *A Technical and Financial Analysis of Smart Prepaid Split Meter on Eskom Electric Distribution Network*
- [11] **Reddy, Rodney**
Title of Thesis: *Network Optimization with High Penetration of Roof-top Solar-PV*
- [12] **Sewnarain, Shikhar**
Title of Thesis: *Harnessing Tidal Energy for Electrical Power Generation in South Africa*

Book Chapter

- [1] **J. D. Dakora, I. E. Davidson, and G. Sharma**, "Conceptual Design and Analysis of Modern Space Solar Power Satellite and Rectenna Systems," in *The 1st International Conference on Maritime Education and Development: ICMED*: Springer Nature, p. 427.
- [2] **B. Madonsela, I.E. Davidson, and C. Mulangu**, "The Analysis of Global Navigation Satellite Systems (GNSS) and the Numerical Estimation of Multipath Propagation," in *The 1st International Conference on Maritime Education and Development: ICMED*: Springer Nature, p. 411.

Journal Articles

- [1] **E. Buraimoh, IE. Davidson, and F. Martinez-Rodrigo**, "Decentralized Fast Delayed Signal Cancellation Secondary Control for Low Voltage Ride-Through Application in Grid Supporting Grid Feeding Microgrid," *Frontiers in Energy Research*, vol. 9, p. 86, 2021. DOI:10.3389/fenrg.2021.643920
- [2] **G. Sharma, N. Krishnan, Y. Arya, and A. Panwar**, "Impact of ultracapacitor and redox flow battery with JAYA optimization for frequency stabilization in lined photovoltaic-thermal system," *International Transactions on Electrical Energy Systems*, p. e12883, 2021. <https://doi.org/10.1002/2050-7038.12883>
- [3] **Y. Arya,, N. Kumar, P. Dahiya, G. Sharma** "Cascade- λ D μ N controller design for AGC of thermal and hydro-thermal power systems integrated with renewable energy sources," *IET Renewable Power Generation*, vol. 15, no. 3, pp. 504-520, 2021. <https://doi.org/10.1049/rpg2.12061>
- [4] **Y. Arya, P. Dahiya, E. Çelik, G. Sharma, H. Gözde, and I. Nasiruddin**, "AGC performance amelioration in multi-area interconnected thermal and thermal-hydro-gas power systems using a novel controller," *Engineering Science and Technology, an International Journal*, vol. 24, no. 2, pp. 384-396, 2021.

EDITORS

Events and Announcements	Upcoming Conferences
<p>Departmental Research Committee (DRC) 04 June 2021 02 July 2021</p> <p>Faculty Research Committee (FRC) 17 May 2021 21 June 2021</p>	<p>9th AFRICON conference, 13-15 September 2021, Arusha, Tanzania <i>(Paper acceptance notification – 25 June 2021)</i></p> <p>IEEE PES & IAS Power Africa Conference, 23-27 August 2021 <i>(Author notification – 31 May 2021)</i></p> <p>NEIS Conference, 13 – 14 September 2021, Hamburg-Schmidt-University, Germany</p>



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