

Electrical Engineer
Prof. Dr. Ir. Ngalula Sandrine Mubenga, PE
Website: www.drmubenga.com Twitter: @NgalulaPE

Experienced Electrical Engineer with area of expertise in renewable energy systems, photovoltaic systems design and integration, energy management, project management, distribution planning & protection, and arc flash mitigation. Over 10 year experience in electrical engineering and holds a Professional Engineer license in Ohio since 2011. Designed/approved/interconnected 50MW of solar photovoltaic systems (see Fig1). Since 2011, Founder and CEO of SMIN Power Group, LLC, a solar developer. Helped manage an energy budget totaling \$65 million for the University of Toledo as Manager, Electrical Engineering in Facilities and Construction for 5 years, which resulted into saving \$5 million.

Since 2018, Assistant Professor in the department of Engineering Technology at the University of Toledo, Ohio. Research interests include battery energy storage, renewable energy systems, electric vehicles, and energy efficiency. Developed the Bilevel Equalizer and the fuel cell hybrid electric vehicle. Teaching experience at the University of Toledo includes Network Analysis, Embedded Systems Designs, and Digital Logic Fundamentals. Holds a record of externally funded grants and scholarships.

Senior member of the Institute of Electrical and Electronic Engineers (IEEE). Named 2018 Engineer of the Year, and 2010 Young Engineer of the Year by the IEEE Toledo Section. Founder and Past-Chair of the IEEE Toledo Graduate of the Last Decade Group-now known as young professional. Served as the General Conference Chair for the 2017 IEEE PES & IAS PowerAfrica Conference in Ghana, which raised \$21,000 and attracted attendees from 33 countries. Earned multiple awards and honors including being appointed by the as a Member of the Board of Directors for the Societe Nationale d' Electricite (SNEL), the national electric utility company in the Democratic Republic of the Congo.

Education / Registration

- Philosophy Doctorate degree in Electrical Engineering, GPA: 3.934/4.000, University of Toledo, Ohio – December 2017. Dissertation: “A Battery Management System for Large Li-ion Batteries with Bilevel Equalization”. Committee: Drs. Tom Stuart (Chair), Alam Mansoor, Richard Molyet, Mohsin Jamali, and Matthew Franchetti.
- Master of Science degree in Electrical Engineering with honors, GPA: 3.943/4.000, University of Toledo, Ohio, December 2008. Thesis: “ A Renewable Energy System for Fuel Cell Vehicles”. Earned the Most Outstanding Master Thesis Award in Electrical Engineering. Committee: Drs. Tom Stuart (Chair), Mohsin Jamali, Richard Molyet, and Salari.
- Bachelor of Science degree in Electrical Engineering, GPA: 3.573 /4.000, Cum Laude, University of Toledo, Ohio.
- Professional Engineer registered in Ohio, 2011.
- Speaks English, French, Swahili, Lingala, and Kikongo. Traveled to 14 countries.
- Certified as a Photovoltaic System Installer / Designer Apprentice, Owens Community College.
- Ohio Facility Construction Commission (OFCC) Higher Education Administration Certification, 2013.

Academic Experience

1. University of Toledo, Toledo, Ohio, USA (01/2018- Present) **Assistant Professor (Tenure-Track), Engineering Technology**

- Teach Electrical Engineering classes and labs, conducts research, advise undergraduate/graduate students, and serve on various committees. Courses include Digital Logic Fundamentals, Embedded Systems Design, Network Analysis, Research and Thesis. For more information, see p 6 -14.

Entrepreneurial Experience

1. SMIN Power Group, (09/2011-Present) **Founder and Chief Executive Officer**

- Founded SMIN Power Group LLC in the state of Ohio, USA in 2011. Led efforts from the business plan development to the state registration process.
- SMIN Power Group focuses on designing and installing renewable energy systems. It also provides energy management and power management services so that people can better their life.

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- Expanded presence in Africa, by opening a registered office in the Democratic Republic of the Congo, in 2013. Since then, efforts have been focused on introducing more photovoltaic systems in Africa.
- In 2017, SMIN Power Group was named Top 5 Innovators for bringing renewable energy in DRC by the Congo Na Paris magazine.
- Positioned SMIN Power Group as a leader in Science Technology Engineering and Mathematics (STEM) by creating a scholarship program to encourage students to study in the STEM fields.
- Directs global business operation, market penetration efforts and partnership strategies, which has resulted in successfully working with companies, schools, communities, media outlets, and individuals.
- Provides technical expertise in photovoltaic system design and integration, renewable energy systems, energy management, power distribution, sustainability, educational strategies and community outreach approaches.

Nonprofit Experience

2. STEM DRC Initiative, (2018-Present)

Founder and President

- Founded the nonprofit STEM DRC Initiative LLC in the state of Ohio, USA in 2018. Led efforts from the plan development to the state registration process and obtention of the 501©3 tax exemption status.
- Founded the nonprofit STEM DRC Initiative ASBL in Kinshasa, D.R. Congo.
- STEM DRC Initiative is a 501©3 nonprofit organization that promotes Science, Technology, Engineering and Math through research, education, and entrepreneurship for students in the D.R.Congo, the USA, and the diaspora. Since its creation, STEM DRC Initiative has directly impacted over 5.800 people through different activities. STEM DRC has provided close to 60 scholarships to students in the DRC, and has over 400 members from the STEM fields.
- Provides direction to the volunteer leadership team.
- Establishes strategic partnerships to advance the mission of STEM DRC and benefits members.
- Overseeing the construction efforts of the STEM DRC Initiative headquarters in Walungu, D.R.Congo.
- Initiated the Scholarship of excellence in STEM and the Excellence in STEM award to highlight the achievement of Congolese youth in STEM.
- Initiated a project to design and manufacture a ventilator in the DRC, in response to Covid19. Established strategic partnership between the members of STEM DRC Initiative, the University of Loyola- ICAM, the Marie Mutombo Hospital, the National Institute for Professional Preparation, E-SAS Com, and Xavier University of Loyola to implement the ventilateur project called " Respirateur RDC".

Selected Professional Experience

3. Societe Nationale d' Electricite, Kinshasa, R.D.Congo (07/2017-Present)

Board Member

- The Societe Nationale D'Electricite (SNEL) is the main electric utility company responsible for serving about 85 million in the Democratic Republic of the Congo.
- SNEL owns and operate electric facilities that provide power generation, transmission, and distribution of electric power and energy to 26 provinces. It has approximately 6,500 employees.
- Appointed by the President of the Democratic Republic of The Congo to serve as a member of the Board of Director in July 2017.
- Entrusted with the oversight of assets and resource of the Society National d'Electricite
- Reviewed strategic level plans and budget and made recommendations.

4. University of Toledo, Toledo, Ohio, USA (05/2012-06/2017)

Manager, Electrical Engineering

- Assisted in managing a budget totaling \$65 million dollars for campus utility use and 8 million square feet of campus infrastructure as the only Electrical Engineer in the department of Facilities and Construction.

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- Saved over \$5 million dollars in utility costs through various energy management projects.
- Generated revenue in excess of 200,000 dollars through energy efficiency rebate checks. Part of it funded the SEED scholarship to encourage student who promote sustainability on campus.
- One of three co-founders of the University of Toledo's Sustainability Energy Efficiency and Design (SEED) initiative.
- Managed the building automation team.
- Managed energy related and electrical engineering activities for University Facilities and Construction.
- Provided comprehensive electrical engineering services for the University including operations, capital improvement projects, new construction, and energy management. The focus of engineering activities were on sustainability, and energy management in current and future construction and maintenance.
- Managed the variable frequency drives program which was cited as a good example in the 2014 and 2015 State Efficiency Report for Ohio.
- Designer and Project Manager for \$ 2 million dollars Campus Energy Cost Reduction project (lighting phase) across over 30 buildings on all campuses in an effort to reduce energy consumption while keeping customer comfortable.
- Initiator for utility scale (250KW) fuel cell installation project with a potential donation worth \$1 million dollars ad partnership with the College of Engineering.
- Managed state certification and inspection program for over 112 boilers across all campuses.
- Managed university metering program (about 165 meters) which included hardware maintenance, communication network, data integration, and administration of two (2) real time websites.
- Assisted Director with community development, energy projects, student involvement and projects, energy website, and developing new and unique ways to reduce campus energy use or improve its efficiency.

5. SSOE Group, Toledo, Ohio, USA (12/2009-05/2012)
Electrical Engineer

American Municipal Power, Columbus, Ohio

- Designed a 4.2MW DC, 12.470KV solar field in Napoleon, Ohio per Fig.1. The installation consists of (17,140) mono-crystalline photovoltaic modules, (24) inverters, and (6) medium voltage transformers.
- Total project cost of 10 million dollar.
- Evaluated options for electrical interconnection to the City of Napoleon and provide information for the PUCO Application for Certification as an eligible Ohio Resource Generating facility.
- Prepared bidding documents and evaluate bids for equipment contract and electrical installation contract.

Medical College Company, Cleveland, Ohio

- Project Engineer for the electrical installation of one (1) new 100,000 PPH natural gas-fired package boiler and auxiliary equipment. Developed power, lighting, instrumentation, control, and field wiring for new installation. Developed interconnection wiring between the boiler control panel and the burner management system.
- Project Engineer for electrical installation of a new water treatment system.

OneEnergy Renewables, Portland, Oregon

- Initially OneEnergy Renewables required engineering assistance to support the submission of an interconnection application to PJM for two(2) photovoltaic (PV) array installations. The client was so satisfied with the work done that they came back with repeat business. A total of four (4) applications.
- 20MW, 3Ph, 69KV, (81,000) Solarworld 250 mono modules, PVPowered inverters (19.5 MW max)
- 20MW, 3Ph, 69KV, (81,000) Solarworld 250 mono modules, PVPowered inverters (19.5 MW max).
- 4MW, 3Ph, 12.470KV, (16,224) Solarworld 250 mono modules, PVPowered inverters (3.38MW max).
- 2MW, 3Ph, 12.470KV, (8,064) Solarword 250 mono modules, PVPowered invereters (1.82MW max).

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- Provided sealed single-line drawings for each of the PV installations depicting the installation from the inverter to the Point of Interconnection (POC) with the utility. Worked with PJM to determine appropriate forms to complete.
- Provided OneEnergy Renewables with information required to complete the Feasibility Study data online form and Attachment N form.

American Electric Power Cardinal Plant Units 1, 2 and 3, Brilliant, Ohio

- Reviewed AEP's arc flash calculations and determined the overall scope to successfully mitigate the incident energy levels greater than or equal to 37 calories / cm² mostly by using SEL 751A relays.
- Reviewed AEP's arc flash calculations and determined the overall scope to mitigate the circuit breakers that are under-rated with respect to short circuit current interrupting capacities, for those breakers where incident energy levels are greater than or equal to 37 calories / cm².
- Generated a written report containing proposed solutions to mitigate arc flash on a bus / circuit breaker basis, including proposed one-line diagram updates.
- Generated protective relay settings for (32) SEL 751A relays and programming using Easypower and AcSELEerator.

City of Hamilton, Hamilton, Ohio

- Developed relay settings for (3) new substations using AcSELEerator. Developed settings for approximately (66) SEL devices including SEL 351-7, 551C, 387, 311L, 351A relays and for the SEL 2032 Communication Processors. Coordinated relays and protective devices using Paladin DesignBase2.
- Developed a Microsoft Access based application called Circuit Tabs. Circuit Tabs is an application which generates various reports such as cable and termination schedule, raceway schedule, cable type list, and equipment list. Once the user has filled the data entry forms, Circuit Tabs calculates the total number of cables and the total cross-sectional area of cables for each raceway. It then selects the appropriate raceway size based on the National Electrical Code. Circuit Tabs also allows the user to overwrite raceway sizes. It automatically shows the circuits that share the same multi-conductor cable, all the circuits that are in a specific raceway, and the route for each circuit.

Ohio Veterans Home, Sandusky, Ohio

- Designed the electrical system for new mechanical room in HVAC System Upgrade, Veteran's Hall project. The electrical system included 480V distribution panel and feeders, variable frequency drives, motor starters, emergency lights and lighting. Performed load calculations and equipment sizing. Visited the site. Gave directions to the CAD operator for the electrical drawings.
- Developed electrical specifications using MasterSpec 2004 format. Developed cost estimate for the electrical system. Reviewed electrical contractor shop drawings and cost estimate for change orders.

City of Dover, Dover, Ohio

- Liaison between the North American Electric Reliability Corporation and customers (cities). The
- Mission of NERC is to ensure the reliability of the North American Bulk-Power System by holding entities accountable for compliance with mandatory NERC Reliability Standards and acting as a catalyst for positive change within the industry.
- Developed and maintained checklist for North American Electric Reliability Corporation (NERC) documents.
- Wrote and/or updated NERC policies/procedures for the city of Dover.
- Completed pre-audit documents for the NERC audit.
- Sized capacitor banks for power factor correction of feeders.
- Performed arc flash study for the entire city of Dover, Ohio and issued recommendations to mitigate arc flash.
- Performed protective device coordination study and issued recommendations.
- Performed relay coordination for new recloser at Dover.

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Power & Energy Group Internal Auditor (ISO 9001-2008)

- Conducted quarterly audits, per the corporate audit schedule, prepared audit reports and submitted before the quarterly Quality System Steering Committee (QSSC) meeting dates.
- Assisted other staff members and answered any questions or concerns they may have about the QS policies and procedures and compliance requirements
- Supported PM's within the SBU/Branch office, helping them as needed with issues involving QS compliance
- Coordinated with SBU Quality System representative (QSR) to determine audit schedule and projects to be audited in the group.
- Conducted audit(s), prepared the audit report and discussed any concerns or observations that require attention, with the SBU QSR.
- Provided list of any issues that may require corporate wide attention to the SBU QSR for her/him to present in the quarterly QSSC meeting.

4. Orbital Technical Solutions, LLC, Toledo, Ohio, USA, (10/2008- 12/2009 Merged with SSOE)
Electrical Engineer

American Municipal Power, Ohio

- Supported AMP for installation of satellite-based SCADA communication system across 21 sites in the US. Documented progress and posted documents on the project FTP site.
- Conducted site surveys. Issued field trip reports and survey forms. Designed communication system integration for each site. Issued detailed scope of work including an equipment list. Co-wrote weekly update for the AMP / OTS team. Supervised electrical contractor during installation. Developed as-built instruction manual. Sketched drawings for each installation. Supervised the CAD operator to produce the drawings from sketches.
- Supported AMP in resolving communication issues with four meters. Investigated problem meter sites to determine cause of communication problems. Issued field trip reports and survey forms. Issued recommendations to test / replace failed equipment.

Consumers Energy, Erie, Michigan

- Supported the upgrade to a distributed control system. Compiled list of analog and digital inputs / outputs for the distributed control system.
- Maintained drawing requests and indexes. Generated loop drawings for various electrical equipment. Double-checked shop drawings.

6. FirstEnergy Corporation / Toledo Edison, Toledo, Ohio(02/2006-12/2006)
Assistant Engineer

- FirstEnergy Corp is an electric utility headquartered in Akron, Ohio. Its subsidiaries and affiliates are involved in the distribution, transmission, and generation of electricity, as well as energy management and other energy-related services. It has 15,617 (2017) employees and generated a revenue of 14.56 billion USD in 2016. FirstEnergy is made up of 10 regulated distribution companies serving 6 millions customers and operating a large infrastructure of more than 269,000 miles.
- Completed circuit analysis for local substation area and developed plan for capacity relief.
- Created circuit models and reconfigured nine feeders to relieve possible overloads on four substation transformers.
- Assisted engineer in field checking 181 transformer installations to verify AM / FM accuracy.
- Issued work request to initiate transformer change outs. Reviewed and processed distributed generation applications (solar and wind) ensuring that the new installation met First Energy protection requirements.
- Developed switch out configurations for substation transformer outages.

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7. Advanced Distributed Generation, LLC, Toledo, Ohio, USA (01/2005-02/2006)

Photovoltaic Systems Designer/Integrator Apprentice

- Designed or / and installed photovoltaic (PV) systems in the Toledo area.
- Performed engineering calculations for alternative energy system on DC and AC current.
- Developed design sketches, material list and estimated cost of PV system.
- Integrated power generation system and electrical components including inverter, DC and AC disconnect and combiner box.

8. General Electric Consumer and Industrial, Fort Wayne, Indiana (09/2002-05/2004)

Cooperative Education Student

- Supported the GE Motors Sales Force (33 members) and assumed co-leadership roles for customer productivity project.
- Coordinated major customer product teardown with potential savings of \$15 million per year.
- Developed and established a customer Dashboard process for Commercial AC Business. Automated data collection process for customer inventory. Improved and simplified data collection tool to allow global plants access.
- Researched market opportunity in states that promote energy conservation for highly efficient 58mm ECM motor retrofit.
- Dynamometer tested 270 production pilot run motors for stator flux interference, which led to a design improvement and reduced the failure rate by 50%.
- Participated in a training class on regulatory agency approval process for Underwriter Laboratory (UL).
- Performed the competitive analysis teardown of more than 17 motors.
- Improved communication skills with global teams when working on global transition project (China and Mexico).
- Maintained commercial AC motor sample flow by tracking 109 samples through design, build and test phases. Led HHJ fan cover supplier approval with productivity of \$30,000.00.
- Assisted application engineers with quality, cost out and improvement projects through completion. Supported the US (Taylor Street plant) to Mexico (Juarez, CASA plant) motor transition projects. Led meetings with the plant in Mexico and the customer to insure corrective action of oil leak issue.

Teaching Experience

1. University of Toledo, Toledo, Ohio, USA (Spring 2018- Present)

Assistant Professor (Tenure Track), Engineering Technology

Teaching Load Fall 2018 (Total: 81 students)

- Digital Logic Fundamentals- EET2210:001 - 4 credit hours - 40 students
- Digital Logic Fundamentals Lab- EET2210:002 - 2 contact hours - 20 students
- Digital Logic Fundamentals Lab - EET2210:003 - 2 contact hours - 20 students
- Digital Systems Design - EET3350:001 - 4 credit hours - 41 students
- Digital Systems Design Lab- EET3350:002 - 2 contact hours - 16 students
- Digital Systems Design Lab- EET3350:003 - 2 contact hours - 16 students
- Digital Systems Design Lab- EET3350:004 - 2 contact hours - 9 students

Teaching Load Spring 2018 (Total: 40 students)

- Network Analysis- EET3250:001- 3 credit hours - 25 students
- Embedded Systems Design- EET3350:001- 4 credit hours- 15 students
- Embedded Systems Design Lab- EET3350:002- 2 contact hours - 15 students

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Teaching Load Spring 2019 (Total: 40 students)

- Network Analysis- EET3250:001 - 3 credit hours - 25 students
- Embedded Systems Design- EET3350:001 - 4 credit hours - 15 students
- Embedded Systems Design Lab- EET3350:002 - 2 contact hours - 15 students

Teaching Load Fall 2019 (Total: 64 students)

- Digital Logic Fundamentals- EET2210:001 - 4 credit hours - 32 students
- Digital Logic Fundamentals Lab- EET2210:002 - 2 contact hours - 16 students
- Digital Logic Fundamentals Lab - EET2210:003 - 2 contact hours - 16 students
- Digital Systems Design - EET3350:001- 4 credit hours - 32 students
- Digital Systems Design Lab- EET3350:002 - 2 contact hours - 16 students
- Digital Systems Design Lab- EET3350:003 - 2 contact hours - 16 students

Teaching Load Spring 2020 (Total: 59 students)

- Network Analysis- EET3250:001 - 3 credit hours - 33 students
- Embedded Systems Design- EET3350:001 - 4 credit hours - 26 students
- Embedded Systems Design Lab- EET3350:002 - 2 contact hours - 26 students

2. Principal Advisor

Graduate students: Kripa Sherma (Masters- graduated), Bolwatito Salami (Masters)

3. Technical Advisor (Spring 2018)

Senior Technology Capstone project: “Alternative Charging Energy”

Design Team: Ashley Wilson, Jarrett Brayer, Luke Fournier, Josh Grzecki, Patrick Molnar, Ian Murphy.

The team design and built the alternative charging energy (ACE) which is a portable power inverter that runs off inexpensive, easily-sourced power tool batteries. ACE converts 36 volts DC to 120volt AC pure sine wave.

4. Mentoring of Teaching Assistant

Graduate students: Noor Ahmad Hazari (PhD), Zeinab Zoghi (Masters)

Noor won the Fall 2018 Outstanding Teaching Assistant Award.

5. Project Initiator and Client Advisor (Fall 2013)

M.I.M.E Senior Design Project: “Fuel Cell Installation”

Faculty Advisers: Dr. Nagi Naganathan and Dr. Matthew Franchetti

Design Team: Brian Hoyt, Michael Manzagol, James McGuire, and Christopher Roloson

This team determined whether it is economically feasible to install a molten carbon fuel cell (MCFC) to supply electricity and heat to The University of Toledo campus. I initiated this project, worked the idea with the City of Westerville, and convinced them to be willing to donate their \$1,000,000 fuel cell pending results from the feasibility study. I also obtained the buy in from the COE Dean and the F&C VP (Chuck Lehnert).

6. Teacher Assistant (01/2007-10/2008)

Supervised and graded undergraduate lab sessions and/or coursework for the following

- Energy Conversion - EECS3460
- Energy Conversion Lab - EECS3480
- Electronics 1 - EECS3400
- Electric Machines Modeling and Conversion Lab - EECS4290
- Digital Signal Processing – EECS 4380/5380 (37 graduate and undergraduate students) - 2007

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7. Graduate Research Assistant (01/2007-10/2008)

- Demonstrated the feasibility of integrating alternative energy technology for the hydrogen economy. The research was financed by the Ohio Office of Development.
- Designed, developed, and tested a hybrid fuel cell / battery system which increased the driving range of an electric vehicle by 183% using hydrogen.
- The sponsor, Kronosport was looking into commercializing the hybrid system.
- Developed a hydrogen generating and filling station that is powered by a solar array. Managed all the aspects of site preparation, safety considerations, emergency action plan, and implementation.

8. University of Toledo, EIT Department Ohio, USA (2001-2005)

Computer Lab Assistant

- Assisted students with various computer applications on windows and mac computers (Outlook, Word, Excel, PowerPoint, Corel, MiniTab, Mac OS X, Windows XP etc).
- Assisted students with UTAD account creations, email creation, printer issues internet web browsing using Mozilla, explorer or safari browser.

9. Fort Wayne, Indiana, USA (2002)

Engineer for a day Volunteer Teacher

- As part of a group of 6 volunteers, taught a 5th grade elementary class how to make an electric motor paper clip, magnet and a battery.

10. Junior Achievement, Van Wert Elementary School, Ohio, USA (2002)

6th Grade Volunteer Teacher

- Taught a 6th grade class of about 18 students the JA Global Marketplace which provides practical information on global economy, what makes trade work and how trade affects student's lives. It was designed to align with academic content from the Partnership for 21 Century Skills in world history, geography and social studies. The JA Global Marketplace module consisted of six (6) lessons of 45min.

11. University of Toledo, Ohio, USA (2000-2001)

Volunteer School Visit Program

- Taught at various schools in the Toledo area about culture and languages from DRC.
- Individual visit to Gesu Catholic School Kindergarten class in 2003. The lesson lasted about 50min.
- Individual visit to Rossford High School class to teach French. The lesson lasted about 50min.
- Group visit to Rogers High School during International Day festival to share the culture from DRC.

Grants

1. Principal Investigator -Dr. Ngalula Mubenga
National Science Foundation – Improving Undergraduate Student Engagement, Submitted, **Pending, External.**
2. Principal Investigator -Dr. Ngalula Mubenga
Johnson and Johnson STEM2D, Submitted, **Pending, External.**
3. Principal Investigator -Dr. Ngalula Mubenga
“A Low Cost Hybrid Equalizer for Large Lithium Ion Batteries”, Ralph E. Powe Junior Faculty Enhancement Award through the Oak Ridge Associated Universities, possible \$10,000, **Pending, External.**

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4. Principal Investigator -Dr. Ngalula Mubenga
“A Bilevel Equalizer with Higher Reliability and Lower Cost ”, University of Toledo Research Award Fellowship , possible \$20,000 **Pending, Internal.**
5. Co-investigator-Dr. Ngalula Mubenga Principal investigator -Dr. Tom Stuart
“ENG2019029 - A Higher Performance Bilevel Equalizer for Lithium Ion Batteries 083018”, Rocket Fuel fund, August 2018. \$25,000, Jan. 2019, **Awarded, External.**
6. Co-investigator-Dr. Ngalula Mubenga, Principal investigator -Dr. Tom Stuart
“A Low Cost Hybrid Equalizer for Lithium Ion Batteries”, LG Chem, Submitted, **Rejected, External.**
7. Principal investigator -Dr. Tom Stuart, Co-investigator-Dr. Ngalula Mubenga
“A Low Cost Cell Equalizer to Increase the Lifetime of Large Lithium Ion Batteries”, ARPA-E Department of Energy FAO# DE-FOA-0001858, **Discouraged, External.**
8. Principal Investigator- Dr. Tom Stuart
Entrepreneurial Lead: Ngalula Mubenga
Entrepreneurial Mentor: Ngalula Mubenga, Kelly Jezierski
“A Battery Management System for Large Li-ion Batteries.” ICorps@Ohio, May 2016, \$15,000, **Awarded, External.**
9. IEEE Toledo Section Travel Grant for presenting paper at the 2015 IEEE international Conference on Renewable Energy Research and Applications, Palermo, Italy, \$1,000, November 2015, **Awarded, Internal.**

Scholarships

1. NSBE General Electric Lloyd Trotter African American Forum Scholarship
2. Technical Society of Toledo Honorary Engineers Week Scholarship
3. Robert W. Heyn Engineering Scholarship
4. Harold A Wott -IEEE Toledo Section Scholarship
5. Golden Key International Honour Society Scholarship
6. University of Toledo International Alumni Affiliate Scholarship
7. Observatory of Conflicts for Peace in Great Lakes Africa Scholarship

Honors and Awards

1. Appointed by the President of the Democratic Republic of Congo as a Directeur General of the newly created Electricity Sector Regulation Authority (ARE) - July 2020.
2. Thought leader during the Foresight Day event organized by the African Union and Afrochampions initiative. This was the first-time Africa’s integration day was celebrated - July 2020.
3. Keynote Speaker at the first University of Toledo College of Engineering Town Hall. The online event was hosted by Michael Toole, Dean of the College of Engineering and attended by about 100 alumni, staff and faculty of the University of Toledo - June 2020.

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4. Elevated to Senior Member of the Institute of Electrical and Electronics Engineers (IEEE). Realization of this grade requires extensive experience and reflects professional maturity and documented achievements of significance. Only 14% of IEEE Power & Energy Society members and only 11% of IEEE members have the distinction of being a Senior member - June 25, 2020.
5. Appointed as IEEE Power and Energy Society(PES) Women in Power (WiP) representative for Central Africa - January 2019.
6. Appointed as IEEE Smart Village Director of Business Development-DRC - December 2019
7. Appointed as Chair of the IEEE PES Congo Scholarship Plus - December 2019
8. Invited speaker at the TedX Montrouge “ Etincelles”, Paris, France - November 2019
9. 2019 Achievement Award by the Congolese Community of Columbus Ohio, Columbus, Ohio - June 2019
10. 2019 Innovative Technology Achievement Award by the Congolese Business Roundtable and Chamber of Commerce, Washington DC, USA - April 2019
11. 2018 Engineer of the Year Award by the Institute of Electrical and Electronics Engineers (IEEE) - Toledo Section, Toledo, Ohio, USA - November 15, 2018
12. 2018 IEEE Certificate of Appreciation in grateful recognition of 10 years of service as an IEEE member, Toledo, Ohio, USA - November 15, 2018
13. 2018-2019 Co-op Hall of Fame by the World Association of Cooperative Education - September 22, 2018 <https://www.waceinc.org/coophof/hall2019/pg5.html>
14. Featured as “2018 Women Killin’it in Sustainability” , Natalie Colarossi, The University Network <https://www.tun.com/blog/women-killin-it-sustainability-research/>
15. 2018 First Place Best Poster Award at the Institute of Electrical and Electronics Engineer National Aerospace and Electronics Conference (IEEE NAECON2018), Dayton, OH, USA - July 2018 <http://sites.ieee.org/naecon-2018/grand-challenge/>
16. 2018 Design News 10 of the Most Important Black Female Engineers , USA –March 5, 2018 <https://www.designnews.com/electronics-test/10-most-important-black-woman-engineers>
17. 2017 Continental Award for Manufacturing and Engineering Sector - Africa Most Influential Women in Business by CEO Magazine based in South Africa - November 2017
18. 2017 Regional Award Award for Manufacturing and Engineering Sector - Africa Most Influential Women in Business by CEO Magazine based in South Africa - October 2017 https://issuu.com/ceoglobal/docs/miw_20regional_20digital_20magazine
19. 2017 Country Award for Manufacturing and Engineering Sector - Africa Most Influential Women in Business by CEO Magazine based in South Africa - October 2017
20. Appointed by the President of the Democratic Republic of Congo as a Member of the Board of Directors at the Societe Nationale d’Electricite (SNEL), the national electric utility company - July 2017
21. Nominee for the 2017 Clean Energy Education & Empowerment Award by C3E initiative a program from the USA Department of Energy in collaboration with MIT Energy Initiative and Stanford Precourt Institute for Energy, USA - March 2017
22. Nominee for the 2016 Most Influential African Women in Business and Government by CEO Mag based in South Africa - December 2016.

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23. 2016 ICorps@Ohio, Team 20-Battery Management University of Toledo, served as Entrepreneurial Mentor and Entrepreneurial Lead. Helped earn \$15,000 research grant - *July 2016*
24. Named one of 40 under 40 by Optimum magazine for fuel cell vehicle research and for founding SMIN Power Group a renewable energy business in DRC, D.R.Congo – 2014.
25. 1.2016 Leja Bulela Certificate of Appreciation for Outstanding Presentation Atlanta, Georgia, USA - July 2013.
26. 2012 Institute of Electrical and Electronics Engineers (IEEE) Certificate of Appreciation for Notable Services and Contributions - June 2012.
27. 2010 IEEE Toledo Section Young Engineer of the Year - November 18, 2010.
28. 2009 Congolese Hero Award, by the Congolese Development Center of Massachusetts in grateful recognition of outstanding community contribution. 2009
29. 2009 Nkoyi Merit Award, by the Congolese Community of the Greater Washington DC Metro Area in recognition of outstanding professional achievements in Electrical Engineering - 2009.
30. University of Toledo, Electrical Engineering and Computer Science Dept. Most Outstanding Thesis Award - November 2008.
31. University of Toledo International Student of the Month.
32. Inducted in the Golden Key International Honour Society - Per invitation only, for seniors and juniors in the top 15% of their class - Fall 2003.
33. Dean's List - Fall 2000, Fall 2001, Spring 2002, Spring 2003, Fall 2003, Spring 2005, Fall 2005.
34. General Electric Co-op Recognition Award for Outstanding Service - Fall 2002, Summer 2003, Spring 2004.
35. International Students Association's Certificate of Achievement- Fall 2001, Spring 2002.
36. National Society of Black Engineers 'Torchbearer Certificate of Achievement - Spring 2002.
37. First Place of the UT American Language Institute (A.L.I) 'Poetry and Essay Contests - Spring 2000.

Leadership & Community Service

January 2020	1. Appointed as IEEE Power and Energy Society(PES) Women in Power (WiP) representative for Central Africa.
December 2019	2. Appointed as IEEE Smart Village Director of Business Development-DRC - December 2019.
December 2019	3. Appointed as Chair of the IEEE PES Congo Scholarship Plus- December 2019.
November 9, 2019	4. Invited speaker at the TedX Montrouge "Etincelles", Paris, France- November 2019.
October 8, 2019	5. Invited presentation "Promoting STEM in Africa" at the University of Toledo Department of Sociology & anthropology Fall 2019 brownbag series across campus and around the world: interdisciplinary dialogue on international issues.
October 3, 2019	6. Invited speaker at the University of Toledo World Languages and Culture roundtable "Languages mean business."

Electrical Engineer
Prof. Dr. Ir. Ngalula Sandrine Mubenga, PE
 Website: www.drmubenga.com Twitter: @NgalulaPE

March 28, 2019	7. Invited speaker to present research at the IEEE Toledo Section Dinner. Event will be held at the University of Toledo Brady Engineering Innovation Center. 1PDH offered to attendees.
February 9, 2019	8. Invited to conduct workshop at the Girl Power Event organized by Imagination Station, Toledo, Ohio. Girl Power is a STEM career day for girls. This program gives young women in our community the opportunity to meet and learn from women in the STEM fields. This event offers a special EXTREME demonstration from Imagination Station, special activities prepared by STEM professionals and the opportunity to explore the science center.
August 5-10, 2018	9. 2018 Energy for Development in a Carbon Constrained World Working Meeting (EDC2018) Organized by the Carnegie Innovation Center at Khavli Royal Society international Center, UK. Per invitation only.
March 29, 2018- Present	10. University of Toledo HUT Haiti Solar Power Project.
March 5, 2018- March 9, 2018	11. University of Toledo Scholars Institute Program- Spring 2018 cohort.
July 2017- Present	12. Appointed by the President of the Democratic Republic of Congo as Member of the Board of Directors at the Societe Nationale d' Electricite (SNEL), the national electric utility company - <i>July 13, 2017</i> . http://mediacongo.net/article-actualite-28458.html
September 2016- August 2017	13. General Conference Chair for 2017 IEEE PES PowerAfrica Conference in Ghana. Under my leadership, we raised \$21,000, received 201 submissions, accepted 104 papers, 228 attendees from 33 countries. http://sites.ieee.org/powerafrica/ See 6/28/17 article by Ghana News Agency titled "Energy Minister urges Africa Leaders to commit to Electrification." http://www.ghananewsagency.org/economics/energy-minister-urges-african-leaders-to-commit-to-electrification-118911
2016	14. Association for the Advancement of Sustainability in Higher Education (AASHE) 2016 Conference Reviewer.
2014-Present	15. 2015 Institute of Electrical and Electronics Engineers (IEEE) Power and Energy Society (PES) General Meeting System Economics Subcommittee.
2011-Present	16. Professional Engineer registered in Ohio.
2011-2012	17. National Society of Professional Engineers- Member.
2012-2017	18. University of Toledo Sustainability Energy Efficiency and Design Initiative - Co-founder and member.
2010-2012	19. Toledo IEEE GOLD Affinity Group - Starter and Chair.
2010-Present	20. IEEE Women in Engineering - Member.
2010-Present	21. IEEE Toledo Section–Member and Past Executive Council Member.
2006-2007	22. University of Toledo Electrical Engineering and Computer Science (EECS) Department Chair Search Committee - Member.
2008	23.EECS Student Council - Graduate Student Representative.
2005	24.Green Energy Ohio - Member.

Electrical Engineer
Prof. Dr. Ir. Ngalula Sandrine Mubenga, PE
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Fall 2003 - Present	25. Golden Key International Honour Society - Member.
August 2000 - 2004	26. National Society of Black Engineers.
August 2000 - 2004	27. African People's Association - Vice President, President.
August 2000 - 2005	28. International Student Association - Representative; Member.
September 2002 - December 2002	29. Junior Achievement - 6th Grade Teacher in Van Wert, Ohio.
August 2000 - February 2001	30. Community Service through School Visits (Rossford high school, Gesu, Rogers high school etc).
February 2001- April 2001	31. Volunteer Computer Lab Assistant at the Toledo Public Library-Sanger Branch Library.

Peer-Reviewed Publications

1. Ngalula Mubenga, "A Renewable Energy System for Fuel Cell Vehicles", Master Thesis, University of Toledo, Ohio, 12/2008.
2. Ngalula Mubenga, "A Battery Management System for Large Li-ion Batteries with Bilevel Equalization", Dissertation, University of Toledo, 12/2017.
3. Ngalula Sandrine Mubenga and Thomas Stuart, "A Case Study on the Hybridization of an Electric Vehicle and the Development of a Solar Powered Hydrogen Generating Station", 2011 IEEE Power Engineering Society General Meeting, Paper#2011GM0558, Detroit, Michigan USA, 07/25/2011.
<http://ieeexplore.ieee.org/document/6039198/>
4. Ngalula Mubenga, "Grid Connected solar photovoltaics in Island States: Challenges, Opportunities and Waste Management", Paper#381, IEEE International Conference on Renewable Energy Research and Applications Conference, Palermo, Italy, 11/25/2015.
[http://ieeexplore.ieee.org/xpl/articleDetails.jsp?arnumber=7418625&filter=AND\(p_Publication_Number:7405753\)](http://ieeexplore.ieee.org/xpl/articleDetails.jsp?arnumber=7418625&filter=AND(p_Publication_Number:7405753))
5. Ngalula Sandrine Mubenga, Zachary Linkous, and Thomas Stuart, "A Bilevel Equalizer for Large Lithium Ion Batteries", Batteries, vol.3, no.4, article no. 39, published by MDPI AG, Basel, Switzerland, Dec.7, 2017. <http://www.mdpi.com/2313-0105/3/4/39>
6. Ngalula Sandrine Mubenga and Thomas Stuart, "A Low Cost Hybrid Equalizer for Lithium Ion BESS ", 2018 IEEE Clemson University Power Systems Conference (IEEE PSC18), Clemson, SC, Sep. 5, 2018.
7. Ngalula Sandrine Mubenga and Thomas Stuart, "A Bilevel Equalizer for Lithium Ion Batteries", IEEE 2018 National Aerospace and Electronics Conference (NAECON 2018), Dayton, OH, USA, October 2018.
8. Mubenga, N.S.; Sharma, K.; Stuart, T. "A Bilevel Equalizer to Boost the Capacity of Second Life Li Ion Batteries". Batteries 2019, 5, 55. published by MDPI AG, Basel, Switzerland, Aug. 1, 2019.
<https://www.mdpi.com/2313-0105/5/3/55/htm>

Selected Publications, Presentations, and Interviews.

1. "Series and Parallel Hybridization of Electric Vehicles by Means of Fuel Cell Integration and Development of Hydrogen Generating Station Powered by a Photovoltaic Array", Mustapha Barakat, Ngalula Mubenga and Thomas Stuart, poster presented at 2008 Ohio Fuel Cell Coalition Symposium, Cleveland, Ohio, USA, 5/2008.

Electrical Engineer
Prof. Dr. Ir. Ngalula Sandrine Mubenga, PE
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2. "Utility Vehicles for the Hydrogen Economy", Thomas Stuart and Ngalula Sandrine Mubenga, Final Report to Ohio Department of Development, Toledo Ohio USA, 7/2010.
3. Presented a seminar on relay protection SEL PROT400 to approximately 10 attendees consisting of Managers and peer Electrical Engineers, Toledo Ohio USA, 2011.
4. Presented a brown bag lunch on "A Case Study on the Hybridization of an Electric Vehicle and the Development of a Solar Powered Hydrogen Generating Station" to approximately 6 peer Electrical Engineers, Toledo, Ohio, USA, 2011.
5. Guest speaker at the SSOE Women Leadership Roundtable, approximately 12 attendees senior level and higher, Toledo, Ohio, USA, 2012.
6. "Overview of Renewable Energy Projects" Ngalula Sandrine Mubenga, presentation at the Leja Bulela 20th Anniversary Conference, Atlanta, Georgia, USA, 7/2013.
7. Special guest on the TV show "Un Homme, Un Concept" hosted by Elysée Odia on CongowebTV, Kinshasa D.R.Congo, 7/26/2013.
8. Special guest on the TV show "Jeunesse et Emploi" hosted by Okono on RTNC2, Kinshasa, D.R.Congo, 7/26/2013.
9. Special guest on the TV show "Expertise Scientifique" hosted by Symon Lelo on RTNC2, Kinshasa, D.R.Congo, 7/29/2013.
10. Guest appearance on the TV show "Bluntely" hosted by on RTNC2, Kinshasa, D.R.Congo, 7/27/2013.
11. "UT Students and City of Westerville Promoting Clean Technology" by Ngalula Sandrine Mubenga, PE, MSEE, University of Toledo Sustainability Energy Efficiency and Design (SEED) Initiative blog, 11/25/2013. <http://journals.utoledo.edu/seed/2013/11/25/ut-students-and-city-of-westerville-promoting-cleantechnology/>
12. "Building Automation Team Saved UT 1.4Million Dollars in FY14" by Ngalula Sandrine Mubenga, PE, MSEE, University of Toledo SEED Initiative blog, 8/10/214. <http://journals.utoledo.edu/seed/2014/10/20/building-automation-team-saved-ut-1-4million-in-fy14/>
13. "New Energy Dashboard Showing Real Time Energy Use!" by Ngalula Mubenga, PE, MSEE, University of Toledo, SEED Initiative blog, 4/21/2015. <http://journals.utoledo.edu/seed/2015/06/01/new-energy-dashboard-showing-ut-real-time-energy-use/>
14. Guest appearance on France24 TV News, France, segment during COP21, commented on decision to allocate \$2billion dollars for Africa transition towards green energy future, 12/2/2015. <http://www.sminpowergroup.com/resources/media/>
15. Invited as a Panel speaker at the European Parliament for two events during Africa Week Conference. Will speak during "Africa in the heart of a globalized world" and "Women Empowerment Forum" web-streamed events, Brussels, Belgium, 4/4 –4/11/2016.
16. Keynote speaker at the Midwest Renewable Energy Association "27th Energy Fair", Wisconsin, USA, 6/19/2016. <https://www.theenergyfair.org/2016/03/08/6865/>

Electrical Engineer
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17. **Forbes Afrique** Interview “Sandrine Mubenga, la spécialiste en Génie Electrique” by Patrick Ndungindi, 8/18/2016. http://www.forbesafrique.com/Sandrine-Mubenga-la-specialiste-en-genie-electrique_a3850.html
18. Keynote Speaker at “ 2nd Makutano Sultani Business Meeting”, Kinshasa, DRC, 9/18/2016.
19. Interview with Kin Event TV channel, Dem. Rep. of the Congo. <https://www.youtube.com/watch?v=104FH6OnHWc>
20. Interview with Makutano, Dem. Rep. of the Congo <https://www.youtube.com/watch?v=z74g6P2VWjM>
21. Interview by CNBC Africa, Dem. Rep. of the Congo “ SMIN Power Group Boss speaks of firms DRC Business amid political uncertainty”, 10/6/2016. <http://www.cnbcfrance.com/video/?bctid=5159305131001>
22. Presenter at the ICorps@Ohio Showcase, Columbus, Ohio, USA October 21, 2016. <https://youtu.be/lcQ9fSIKRwc> & <https://icorpsohio.org/events/>
23. Speaker at Institute of Electrical and Electronics Engineers (IEEE) Toledo Section Dinner and Presentation, presented “Grid Connected Solar Photovoltaic”, Rossford, Ohio, USA 11/3/2016. <http://ewh.ieee.org/r4/toledo/>
24. Interview by Economico.cd, Dem. Rep. of the Congo “Le Ghana Reflechit a Electrifier l’Afrique”, February 9, 2017. <http://www.economico.cd/2017/02/09/power-africa-2017-ghana-reflechit-a-electrifier-lafrique/>
25. Interview by Economico.cd, Dem. Rep. of the Congo “Sandrine Mubenga Lufungulo: Et si on Electrifierait l’Afrique?”, May 26, 2017. <http://www.economico.cd/2017/05/26/sandrine-mubenga-electrifier-afrique/>
26. “Lowering the Cost of Energy Storage for E/HV and Grid Applications Using the Bilevel Equalizer for Large Li-ion Batteries.” Invited Presentation at The Advanced Design & Manufacturing Expo, Cleveland, Ohio, USA. March 7, 2018. <http://schedule.admcleveland.com/speaker/mubenga-phd-pe-dr-ngalula-sadrine/49072>
27. Interview by Design News, USA: “New Battery Management Technology Could Boost Range and Longevity of Big Packs “, Charles Murray, February 20, 2018. <https://www.designnews.com/electronics-test/new-battery.../111735579058280>
28. Interview by UTNews, USA: “UT Engineer Creates Solution to Cheaper Longer Lasting Battery Packs”, Christine Billau , March 6th, 2018. http://utnews.utoledo.edu/index.php/03_06_2018/ut-engineer-creates-solution-to-cheaper-longer-lasting-battery-packs
29. Interview by WTOL TV channel, USA: “ UT Professor brush with Death Inspires Energy Storage Invention”, Victoria Idoni, March 9, 2018. <http://www.wtol.com/story/37691956/ut-professors-brush-with-death-inspires-energy-storage-invention>
30. Interview by the Toledo Blade, USA : “University of Toledo engineer finds power from near death experience”, Jay Skebba, March 10, 2018. Article and video available online at <http://www.toledoblade.com/Technology/2018/03/10/University-of-Toledo-engineer-finds-power-from-near-death-experience-literally.html>

Electrical Engineer
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31. Interview by Agence d'Information d'Afrique Central , Congo Brazza “ Energie Electrique: Sandrine Mubenga invente une nouvelle technologie revolutionnaire » Patrick Ndungini, March 13, 2018. <http://www.adiac-congo.com/content/energie-electrique-sandrine-mubenga-invente-une-nouvelle-technologie-revolutionnaire-80588>
32. Interview by 13 ABC TV Channel, USA “ Near Death Experience Leads UT researcher to her Life's Work”, Lissa Guyton, March 15, 2018. <http://www.13abc.com/content/news/UT-professor--477013543.html>
33. Interview from The University Network's, USA: « Near Death Experience Inspires Hybrid Technology for Cheaper Longer Lasting Batteries,” Jack Schroeder March 17, 2018. <https://www.tun.com/blog/hybrid-technology-for-cheaper-longer-lasting-batteries/>
34. Interview by NBC24 TV Channel, USA: “UT Researchers Develop New energy Storage Solutions,” Karaline Cohen, March 27, 2018. <http://nbc24.com/news/local/ut-researchers-develop-new-energy-storage-solution>
35. Interview by Africanshapers “USA Sandrine Mubenga laureate du prix ingenieur de l'annee,” Patrick Ndungini, November 20, 2018. <https://africanshapers.com/usa-sandrine-ngalula-mubenga-laureate-du-prix-de-lingenieur-de-lannee/>
36. Interview by Voice of America- Africa, USA “Afrotech show” April 3, 2019. <https://www.youtube.com/watch?v=mu8Jr8JAed4>
37. Interview by Jeune Afrique,” Sandrine Mubenga, genie electrique” Special RDC Edition, no 3063, p 120-121, 22-28 September, 2019.
38. News Release by University of Toledo, “UTOLEDO ELECTRICAL ENGINEER LEADING CHARGE TO BUILD VENTILATORS IN THE CONGO”, Christine Billau, May 14, 2020. <http://media.utoledo.edu/2020/05/14/utoledo-electrical-engineer-leading-charge-to-build-ventilators-in-the-congo/>
39. Interview by The Next Einstein Forum, “Is Africa ready to take advantage of the energy transition to come? Dr. Sandrine Mubenga gives her point of view”, June 30, 2020. <https://nef.org/lafrique-est-elle-prete-a-tirer-profit-de-la-transition-energetique-dans-un-contexte-de-4ir/>



Fig 1:N. Sandrine Mubenga in front of the 4.2 MW solar field she designed for the City of Napoleon, Ohio.