

## MOHAMED TAMASAS ELRAIS

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### EDUCATION

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- Ph.D. in Electrical Engineering, University of Central Florida. Aug 2019 – present
- GPA 4.00 on a scale of 4.00.
  - Ph.D. Candidate.
- The Intensive English Program, University of Washington. Sep 2015 – Aug 2016
- Outstanding Student.
- M.Sc. in Electrical & Electronic Engineering, University of Benghazi, GPA 3.91/4. June 2013
- Thesis Title: *Evaluation of different modulation techniques for a multilevel inverter based on multicarrier level shifted P.W.M.* Validated hardware and software using experimental setup and Matlab/Simulink.
- B.Sc. in Electrical & Electronic Engineering, University of Benghazi, GPA 3.6/4. July 2007
- Graduation research project: *Controlled rectifier with improved power factor.* Validated hardware and software using experimental setup and Matlab/Simulink.

### RESEARCH & TEACHING EXPERIENCE

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University of Central Florida, Department of Electrical and Computer Engineering Aug 2019 – present

**Job title:** Graduate Research Assistant

- Doing literature reviews to identify problems and limitations of the existing solutions in Power Electronics and doing research accordingly to find solutions.
- Implementing the solutions by analyzing, designing, developing, prototyping, and testing innovative power converters that overcome the limitations of the exciting ones.
- Work on writing grant proposals and filing patents for the developed technology.
- Sharing our findings through peer-reviewed publications.

University of Central Florida, Department of Electrical and Computer Engineering Aug 2019 – present

**Job title:** Graduate Teaching Assistant

- Assisting faculty members with classroom instruction, exams, and assessing students' performance.
- Preparing presentations for lectures and delivering them in class and virtually.
- Conducting discussion classes and helping students build problem-solving skills.
- Grading Homeworks, Quizzes, and Exams.
- Providing students with timely feedback to aid in their development.
- Built experience using Canvas.
- Writing course assessment's reports at the end of the semesters.

University of Benghazi, Department of Electrical and Electronic Engineering.

Oct 2017 – Jun 2019

**Job title:** Faculty Member

Jun 2013 – Aug 2015

- Conducted research and published papers in the field of Electrical & Electronic Engineering, with an emphasis on Power Electronics
- Served as a primary teacher and taught the following undergraduate courses:
  - Electromechanical Energy Conversion I, Third year course.
  - Circuit theory I, Second year course.
  - Circuit theory II, Second year course.
  - Power Electronics Fourth year course.
  - Basic Electrical Lab. I, Second year course.
  - Basic Electrical Lab. II, Second year course.
  - Measurement Lab, Third year course.
- Assessed students' performance.
- Applied and developed new teaching methodologies.
- Supervised laboratory experiments.
- Conducted discussion groups.
- Supervised 4th Year Projects in field of the Power Electronics. This includes giving the research guidelines, advising the students throughout the whole research activities, reviewing students' written work, evaluating students' performance, supervising and helping students in their projects' lab experiments, writing reports about students' progress.

University of Benghazi, Department of Electrical and Electronic Engineering.

Jan 2009 – Jun 2013

**Job title:** Graduate Teaching Assistant

- Taught tutorials for large classes (50-70 students) in Electromechanical Energy Conversion I, Power Electronics, Circuit Theory I, and Power System Analyses I,
- Supervised and helped students to conduct the experiments in the Basic Electrical Lab. I&II, Power Electronics lab, and Measurement Lab
- Held office hours and assisted students.

## ***INDUSTRY EXPERIENCE***

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General Electrical Company Of Libya (GECOL),  
Benghazi Regional Control Centre (BRCC), Benghazi, Libya

Mar 2009 – Jun 2013

**Job title:** Electrical Dispatcher Engineer

- Controlled and monitored the electrical transmission system of the eastern area of the Libyan electrical grid.
- I had taken part in regaining the electricity two times after blackouts in the Eastern Libyan Public Network.
- Load shedding when electricity demand is greater than maximum power generation.
- Prepared, schedule and issued switching orders to route electrical currents around areas that needed maintenance or repair.
- Managed the generation outputs according to the grid requirements.
- Worked with power plant operators to troubleshoot electricity generation issues.
- Taken emergency actions when transformer or transmission line failed, and routed current around affected areas.

## **COMMUNITY SERVICE**

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- Volunteered as a mentor in the Intensive English Program at the University of Washington. Jun 20 - Aug 19, 2016
- Volunteered at the Libyan Society of Cancer Patient Friends 2012 – 2015
- Volunteered for the Supreme Committee for the municipal elections in Benghazi in the first election in the country. Jun 6, 2012

## **LANGUAGES**

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- Arabic: Native speaker.
- English: Fluent and experienced using English for workplace conversation, professional presentations and communication, and academic correspondence.

## **RESEARCH INTERESTS**

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**Main:** Power Electronics and its applications in renewable energy systems and transportation.

**Current:** Design and control of multiport power converters for photovoltaic and battery integration to the grid, multilevel power inverters, and electrical vehicles (EV) chargers, all based on GaN and SiC devices.

## **SKILLS**

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Power Electronics, experienced with lab equipment such as oscilloscopes, along with soldering and debugging skills. PCB design, Schematic drawing and layouts, PCB assembly, Altium Designer, Gate Drives, MATLAB, Simulink, PSIM, C/ C++, Microcontroller, Arduino, Pspice, LTSpice, Multisim, LabVIEW, Power Systems, Excellent communication, and presentation skills. Strong analytical and problem-solving skills.

## **AFFILIATIONS**

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- The Florida Power Electronic Center Lab at the University of Central Florida August 2019 – present
- Member of Washington Yacht Club May 2016 – July 2017
- IEEE member 2012 – present
- One of the Libyan national team of windsurfing 2004 – 2015
- Member of Benghazi Sailing Club 1999 – present

## **HONORS AND AWARDS**

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- An outstanding student at the International and English Language Program at the University of Washington, Winter and Spring quarters 2016.
- Ministry of Higher Education Scholarship, July 2014.
- First prize winner of the advanced referee's session hosted by the Libyan General Federation of Sail and marine sports in Benghazi Sailing Club in coordination with the International Federation of Sail, April 2010.
- First prize winner of the Libyan championship for windsurfing, July 2008.

## **PENDING PATENT**

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- Mohamed Tamasas Elrais and Issa Batarseh, Ph.D. "A GaN-BASED MULTIPORT MULTILEVEL CONVERTER /INVERTER."

## **SELECTED GRADUATE COURSES**

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- Power Electronics.
- Semiconductor Material & Device Characterization.
- Discrete Time & Computer Control.
- Advanced Electronics Instrumentation.
- Generalized Theory of Electrical Machines.
- Power Systems Control & Stability.
- Industrial & Domestic Distribution Systems.
- Power System Analysis.

## **PUBLICATIONS**

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- **M. T. Elrais** and I. Batarseh, "A GaN Based Four-Port Flying Capacitor Multilevel Converter," *2021 IEEE Energy Conversion Congress and Exposition (ECCE)*, Vancouver, BC, Canada, Oct. 2021, pp. 2480-2486, doi: 10.1109/ECCE47101.2021.9595748.
- **M. T. Elrais** and I. Batarseh, "Design and Experimental Study of a GaN-based Three-Port Multilevel Inverter," *IECON 2021 - 47th Annual Conference of the IEEE Industrial Electronics Society*, Toronto, ON, Canada, Oct 2021, pp. 1-6, doi: 10.1109/IECON48115.2021.9589232.
- Md Safayatullah, Reza Rezaii, **M. T. Elrais** and I. Batarseh, "Review of Control Methods in Grid-Connected PV and Energy Storage System," *2021 IEEE Energy Conversion Congress and Exposition (ECCE)*, Vancouver, BC, Canada, Oct. 2021, pp. 951-958, doi: 10.1109/ECCE47101.2021.9596022.
- Fahad Alaql, Reza Rezaii, Sahin Gullu, **M. T. Elrais** and I. Batarseh, "A Switchable Rectifier-based LLC Resonant Converter for Photovoltaic Applications," *2021 IEEE Energy Conversion Congress and Exposition (ECCE)*, Vancouver, BC, Canada, Oct. 2021, pp. 2093-2098, doi: 10.1109/ECCE47101.2021.9595746.
- S. Ghosh, M. Safayatullah, **M. T. Elrais** and I. Batarseh, "A Novel Four-port LLC Converter for Dual PV and Battery Integration, " *IECON 2021 – 47th Annual Conference of the IEEE Industrial Electronics Society*, 2021, pp. 1-6, doi: 10.1109/IECON48115.2021.9589562.
- Mawia Elgazzar, Maha Eljahmy, **Mohamed Elrais**, and Ahmed Hammouda, "Simulation and Practical Implementation of PV Solar Energy Conversion System" *In Proceedings of the 7th International Conference on Engineering & MIS 2021 (ICEMIS'21)*. Association for Computing Machinery, New York, NY, USA, Article 80, 1–7. doi: 10.1145/3492547.3492665.
- N. Farkash, A. Ramdan, S. Alsahly and **M. T. Elrais**, "Comparison of Three Modulation Techniques for Single Phase Half Bridge 5-Level Diode Clamped Inverter Based on Level Shifted PWM," *2020 11th*

*International Renewable Energy Congress (IREC)*, Hammamet, Tunisia, 2020, pp. 1-6, doi: 10.1109/IREC48820.2020.9310399.

- Rafik Gebreil, Taha Elferjani, Salem Borghed, Ahmed Hammada, **Mohamed Tamasas Elrais**, Muhanad Albarassi, and Rima Elzwawi, "Practical and simulation implementation of Bi-directional DC/DC converter controlled by ARDUINO using MATLAB-SIMULINK. *In Proceedings of the 6th International Conference on Engineering & MIS 2020 (ICEMIS'20)*. Association for Computing Machinery, New York, NY, USA, Article 38, 1–7.
- Hammada, M. Buamud, **ME Tamasas**, A. Mohamed, A Khalil, M Nasr, S Khan, "Experimental verification and simulation of two stages positive output cascade boost converter super-lift DC/DC Luo-converter," *International Conference on Engineering Technologies and Applied Sciences (ICETAS), 2017 4th IEEE Conference*, Bahrain , Nov 2017, pp 1-7, doi: 10.1109/ICETAS.2017.8277883.
- **M. E. Tamasas**, M. Saleh, M. Shaker and A. Hammada, "Comparison of Different Third Harmonic Injected PWM Strategies For 5-level Diode Clamped Inverter," *Power and Energy Conference at Illinois (PECI), 2017 IEEE*, Illinois, Urbana-Champaign, February 2017, pp 1–6, doi: 10.1109/PECI.2017.7935718.
- **M. Tamasas**, M. Saleh, M. Shaker and A. Hammada, "Evaluation of modulation techniques for 5-level inverter based on multicarrier level shift PWM," *Mediterranean Electrotechnical Conference (MELECON), 2014 17th IEEE*, Beirut, Lebanon, April 2014, pp. 17-23, doi: 10.1109/MELCON.2014.6820499.
- Hammada, M. Buamud, M. Nasr and **M. Tamasas**, "Estimation of advanced DC/DC Luo-converters based on Energy factor and sub-sequential parameters," *Energy Conference (ENERGYCON), 2014 IEEE International*, Dubrovnik, Croatia, May 2014, pp. 209 – 215, doi: 10.1109/ENERGYCON.2014.6850430.
- Hammada, M. Buamud, M. Nasr and **M. Tamasas**, "Experimental Verification and Simulation of an Elementary of positive output voltage lift DC/DC Luo-converter," *Energy Conference (ENERGYCON), 2014 IEEE International*, Dubrovnik , Croatia, May 2014, pp. 202 – 208, doi: 10.1109/ENERGYCON.2014.6850429.