

Akrem Mohamed Aljehaimi

B.Sc., M.Eng., Ph.D.
Senior Lecturer
Electrical and Electronic Engineering Department, Misurata University
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PROFILE

- Proven background. Delivering in a stressful and deadline-oriented environment
- Mentoring and leading research projects, a good team player, talented problem solver
- 4 years of working experience in the control of electric machines; eg. vector control, nonlinear control, adaptive control, parameters estimation, and in power electronic converters (two-level and multilevel)
- Great working experience with different software: Matlab (Coding and Simulink), PSIM, and Finite Element Analysis
- Effective communication and presentation skills: TA and lab demonstrator for 4 plus years and a presenter of conference papers
- 5 plus years of research experience in Multidisciplinary fields with 8 IEEE journal and conference papers

EDUCATION

- Ph.D. in Electrical Engineering** 2014-2018
Concordia University, Montreal, Canada
Supervisor: Prof. Pragasen Pillay
Thesis: A Rotor Flux Linkage Estimator and Operating Envelopes of a Variable-Flux IPM Synchronous Machine
- M.Eng. in Electrical Engineering** 2010-2012
Concordia University, Montreal, Canada
Relevant courses: Power Electronics I&II, Computer-Aided Analysis for Power Electronic Systems, Hybrid Electric Vehicle, Advanced Electric Machines and Drives, and Renewable Energy Systems
- B.Sc. in Electrical Engineering** 2002-2007
Misurata University, Misurata, Libya
Supervisor: Prof. Faraj Berba
Thesis: Harmonics in Power Systems; analysis and mitigation

PROFESSIONAL EXPERIENCE

Senior Lecturer

Engineering Faculty, Misurata University, Misurata Libya

Dec 2018-present

COURSES I HAVE THOUGHT:

- Controlled Electric Drives
- Electric Machines I (DC Machines)
- Electric Machines III (AC Machines)

RESEARCH INTERESTS:

- Control of Electric Vehicles
- Modeling and Analysis of Renewable Energy Systems (Solar and Wind).
- Stand-Alone Solar Energy Systems.
- Power Electronic Converters for Grid-Connected Solar Systems.

Research Associate

PEER Group, Concordia University, Montreal, Canada

May 2018-Nov. 2018

RESEARCH INTERESTS AND AREAS OF EXPERTISE:

- Control of electrical machines; e.g. vector control, nonlinear control, and adaptive control
- Power electronic converters, two-level and multilevel
- The effect of multilevel converters on the core losses of electrical machines
- Design and calibration of test benches to characterize the electrical machines
- Building power electronic converters such as two-level and three-level inverters and two-level active front-end rectifiers

Research Assistant

PEER Group, Concordia University, Montreal, Canada

Jan. 2014-April 2018

- Characterization of specially designed permanent magnet synchronous motors for automotive application
- In-lab designing and building of a 5 kW controlled electric drive system for a variable-flux permanent magnet synchronous motor

- Designing, building, and controlling of a three-phase active front-end rectifier for regenerative braking of a variable-flux permanent magnet synchronous motor
- Designing and tuning of a nonlinear active filter for extracting the back emf harmonics in motoring mode
- In-lab building and testing of 15 kW two- and three-level inverters for core loss comparison
- Good laboratorial experience with those three real-time simulators: Opal-RT, dSPACE, and DSP
- Installation and calibration of torque transducers for static and dynamic torque measurement of permanent magnet and synchronous reluctance machines
- Shaft-mounting and calibration of absolute encoders for real-time control purpose of synchronous motors
- Writing technical papers for international conferences and journals in power electronics, electric machines, and drives

Teaching Assistant and Lab Demonstrator

Concordia University, Montreal, Canada

2014- 2018

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| • Tutor for Renewable Energy (ELEC437) | Winter term 2018 |
| • Lab demonstrator for Power Electronics (ELEC433) | Fall term 2017 |
| • Lab demonstrator for Electrical machines (ELEC331) | Winter term 2017 |
| • Tutor for Applied Advanced Calculus (ENGR233) | Winter term 2017 |
| • Lab demonstrator for Power Electronics (ELEC433) | Fall term 2016 |
| • Tutor for Fundamental Electric Circuits (ELEC273) | Fall term 2016 |
| • Tutor for Applied Advanced Calculus (ENGR233) | Fall term 2016 |
| • Tutor for Applied Advanced Calculus (ENGR233) | Summer term 2014 |

Technical Support Agent

Teleperformance Canada, Montreal, Canada

Provides technical support service over the phone to Apple CPU customers

Jan. 2013 – June 2013

AWARDS

Concordia University Accelerator Award (\$5000 CAD)	2018
Concordia University Conference and Exposition Award (\$1000 CAD)	2017
ITEC2017 Conference student-travel scholarship, from IEEE- Power Electronics Society (TC4: Vehicle and Transportation Systems), Chicago, USA (\$750 USD)	2017

COMPUTER SKILLS

Electrical engineering software: MATLAB, Simulink, PSIM, RETScreen

Finite element software: JMAG

General software: Microsoft office

SOCIETY AND COMMITTEE MEMBERSHIPS

Regular Reviewer in the IEEE Transaction on Industry Application

Regular Reviewer in the IEEE Transaction on Transportation Electrification

Reviewer for IEEE Conferences including PEDES and ITEC

IEEE member

PUBLICATIONS

Journal Papers

1. **Akrem Mohamed Aljehaimi** and Pragasen Pillay, "Novel Flux Linkage Estimation Algorithm for a Variable Flux PMSM," *IEEE Transactions on Industry Applications*, vol. 54, no. 3, p. 2319-2335, May/June 2018. DOI: 10.1109/TIA.2018.2794338.
2. **Akrem Mohamed Aljehaimi** and Pragasen Pillay, "Operating Envelopes of the Variable Flux Machine with Positive Reluctance Torque," *Accepted for publication in IEEE Transactions on Transportation Electrification*, 18 Apr. 2018. DOI: 10.1109/TTE.2018.2828385.
3. **Akrem Mohamed Aljehaimi** and Pragasen Pillay, "Braking a Variable Flux-Intensifying IPMSM in Minimal Time," *Accepted for publication in IEEE Transactions on Transportation Electrification*, 17 Aug. 2018. DOI: 10.1109/TTE.2018.2865908.
4. Lesedi Masisi, Maged Ibrahim, John Wanjiku, **Akrem Mohamed Aljehaimi**, and Pragasen Pillay, "The Effect of Two- and Three-Level Inverters on the Core Loss of a Synchronous Reluctance Machine (SynRM)," vol. 52, no. 5, p. 3805-3813, Sept./Oct. 2016. DOI: 10.1109/TIA.2016.2569400.

Conference Papers

5. **Akrem Mohamed Aljehaimi** and Pragasen Pillay, "Online rotor flux linkage estimation for a variable flux interior permanent magnet synchronous machine operating at different flux density levels," in *IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES)*, Trivandrum, 14-17 Dec. 2016. DOI: 10.1109/PEDES.2016.7914310.
6. **Akrem Mohamed Aljehaimi** and Pragasen Pillay, "Torque and power improvement for a variable flux permanent magnet synchronous machine," in *IEEE Transportation Electrification Conference and Expo (ITEC)*, Chicago, 22-24 June 2017. DOI: 10.1109/ITEC.2017.7993308.
7. **Akrem Mohamed Aljehaimi** and Pragasen Pillay, "Closed-loop magnetization-state controller for variable-flux interior permanent magnet synchronous machine," in *IEEE Energy Conversion Congress and Exposition (ECCE)*, Baltimore, 29 Sept.-3 Oct. 2019, DOI: 10.1109/ECCE.2019.8913196.
8. Bigyan Basnet, **Akrem Mohamed Aljehaimi** and Pragasen Pillay, "Effect of Magnetization Pulse Width on the Back EMF of a Variable Flux Machine and on Inverter Sizing," in the *45th Annual Conference of the IEEE Industrial Electronics Society (IECON)*, Lisbon, 14-17 Oct. 2019, DOI: 10.1109/IECON.2019.8927414.

PRACTICAL PROJECTS:

1. "A Stand-Alone Solar Energy System Supplying the Electrical Engineering Department Office at Misurata University," A Capstone Project, which I am supervising, currently is going on and will be presented in Winter 2019/2020.
2. "A Stand-Alone Wind Energy System Supplying Home Appliances," This project was a part of Renewable Energy Course conducted by Dr. Akrem Mohamed Aljehaimi at Concordia University in Canada during Master's Studies, 2012.
3. "Design and Control of Uninterruptable Power Supply," This project was a part of Power Electronics II course conducted by Dr. Akrem Aljehaimi at Concordia University in Canada during Master's Studies, 2012.
4. "Speed Control of Permanent Magnet Synchronous Machine Using Hysteresis Current Control Pulse Width Modulation," This project was a part of Controlled Electric Drive course conducted by Dr. Akrem Mohamed Aljehaimi at Concordia University in Canada during Master's Studies, 2011.
5. "Harmonics in Power System: Analysis and Mitigation," Graduation Project for the Bachelor Degree in Electrical Engineering, Misurata University, 2007

REFERENCES AVAILABLE UPON REQUEST