

Walid Morsi Ibrahim, PhD, PEng

Associate Professor, Department of Electrical, Computer and Software Engineering, Faculty of Engineering and Applied Science at University of Ontario Institute of Technology

Oshawa, ON, CA

Safeguarding Canada's electrical power grid operation from the threat of a natural disaster or cyberattack

Description

Canada's aging electrical power grid was designed to power homes, businesses and industry, long before electric vehicles hit the road. Over the past decade, a major shift in the electric power distribution grid has seen renewable energy and the electrification of the transportation sector, including cars, trucks, buses and trains, emerge. The demand to establish an electric vehicle charging infrastructure and energy storage systems has raised concerns over electrical grid sustainability and security. Dr. Walid Morsi Ibrahim, PhD, is an Associate Professor in the Department of Electrical and Computer Engineering in the Faculty of Engineering and Applied Science at UOIT. His latest research aims to address critical issues of resiliency and cyber security within the electrical power grid. Awarded by the Canada Foundation for Innovation, Dr. Morsi's research will explore ways to safeguard Canada's electrical grid operation in the event of a natural disaster or cyberattack.

An expert in smart grid design and analysis, his robust research agenda focuses on the smooth integration of renewable energy and transportation electrification into the electrical power grid to help reduce greenhouse gas emissions. Situated in Canada's energy hub, Dr. Morsi joined UOIT in 2010 as an Assistant Professor. He has collaborated on the development of UOIT's unique Smart Grid specialization for third-year students in the Electrical Engineering undergraduate program.

Dr. Morsi is an Adjunct Professor in the Department of Electrical and Computer Engineering at the University of Waterloo. In 2016, he was named Senior Member of the Institute of Electrical and Electronics Engineers (IEEE) for his contributions to the advancement of power systems and smart grid technology. He has received numerous awards for his work including Best Paper Award, IEEE International Symposium on Power Electronics for Distributed Generation Systems.

Inspired by engineering design, he earned both his Bachelor of Science and Master of Applied Science in Electrical Engineering from Suez Canal University in Ismailia, Egypt. He moved to Canada and completed his Doctorate in Electrical Engineering at Dalhousie University in Halifax, Nova Scotia in 2009, at a time when interest in power systems and smart grid technology was gaining ground. Dr. Morsi was previously appointed Assistant Professor, Electrical and Computer Engineering Department, at the University of New Brunswick in Fredericton, New Brunswick.

Industry Expertise

Cleantech, Education/Learning, Electrical Engineering, Energy, Industrial Automation, Program Development, Renewables and Environmental, Research, Security, Transportation/Trucking/Railroad

Topics

Automation, Protection and Management of Power Systems , Smart Grid Operation Management and Control, Smart Grid Design, and Analysis, Signal Processing and Data Analytics of Power Systems, Transportation Electrification

Affiliations

Institute of Electrical and Electronic Engineers (IEEE), IEEE Power Engineering Society, Professional Engineers Ontario, Ontario Society of Professional Engineers

Past Talks

Impact of Second-Generation Plug-In Battery Electric Vehicles on the Aging of Distribution Transformers Considering TOU Prices
IEEE Power and Energy Society General Meeting

Smart Grid Research
IEEE Research Showcase

Understanding Power Quality in Smart Grids
10th IEEE International Conference for Upcoming Engineers

Education

Dalhousie University
PhD Electrical Engineering

Suez Canal University
MSc Electrical Engineering

Suez Canal University
BSc Electrical Engineering

Accomplishments

Outstanding Master's Thesis Award, UOIT
Under the supervision of Dr. Morsi, Jessie Michael Gillis, Master of Applied Science in Electrical and Computer Engineering student received the 2017 Outstanding Master's Thesis Award for his thesis entitled: Time-Frequency Analysis Techniques for Non-Intrusive Load Monitoring.

Senior Member, Institute of Electrical and Electronics Engineers
Dr. Morsi was appointed to this role for his contributions to advancing the field.

Poster Award, 9th Annual Design Exhibition, UOIT

Dr. Morsi and his students received this award for their poster entitled: Intelligent Energy Monitoring System Design for Smart Homes.

Adjunct Professor, Department of Electrical and Computer Engineering, University of Waterloo

In this role, Dr. Morsi collaborates on research projects and supervises student research.

Poster Award, 6th Annual Design Exhibition, UOIT

Dr. Morsi and his students received this award for their poster entitled: Solar Generation Tracking System.

Centre of Learning and Teaching Award, UOIT

Dr. Morsi received this award for Improvement in Teaching Scores.

Best Paper Award, IEEE International Symposium on Power Electronics for Distributed Generation Systems

Dr. Morsi received this award for his paper entitled: A New Islanding Detection Approach Using Wavelet Packet Transform for Wind-based Distributed Generation.

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