

# **Sheldon S. Williamson, PhD**

**Canada Research Chair in Electric Energy Storage Systems for Transportation Electrification, and Associate Professor, Faculty of Engineering and Applied Science at University of Ontario Institute of Technology**

Oshawa, ON, CA

Leading novel research to shift Canada's transportation industry to smart electric energy storage systems and fast-charging infrastructures

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## **Description**

To keep pace with Canada's ambitious goal to reduce greenhouse gas emissions by 30 per cent below 2005 levels by 2030, the automotive industry aims to provide affordable and reliable electric vehicles as an optimized, sustainable transportation solution for personal and mass transit. Yet, the driving range of an electric vehicle is still curbed by the charge of its battery pack. At best, Lithium-ion batteries for electric vehicles currently provide a 300- to 350-kilometre driving range on a single charge, and cost three to four times more than gas-powered vehicles.

Sheldon S. Williamson, PhD, Canada Research Chair in Electric Energy Storage Systems for Transportation Electrification, and Associate Professor in the Department of Electrical, Computer and Software Engineering in the Faculty of Engineering and Applied Science, is leading groundbreaking research to extend the overall lifecycle of Lithium-ion batteries in electric vehicles using novel power electronic converter management systems. He is also focused on creating wireless and plugged fast-charging infrastructures for convenient use. Notably, he is spearheading development of the world's first method for charging electric vehicles using solar power and he aims to establish a first-of-its-kind Advanced Storage Systems and Electric Transportation (ASSET) Laboratory, featuring a solar charging station, at UOIT. Motivated to shift Canada's transportation system from fossil fuels to renewables, his research also explores electrifying mass transit using ultracapacitors.

Since joining UOIT in July 2014, Dr. Williamson has been the Founder and Director of the Smart Transportation Electrification and Energy Research (STEER) group. Previously, he was an Associate Professor in the Department of Electrical and Computer Engineering at Concordia University in Montreal. He received his Bachelor of Engineering in Electrical Engineering with high distinction from the University of Mumbai in India in 1999. In 2002, he earned his Master of Science and his Doctorate in 2006, both in Electrical Engineering, specializing in Automotive Power Electronics and Motor Drives from the Illinois Institute of Technology.

Noted author and co-author of over 150 papers, and several books and book chapters on electric transportation and energy storage systems, Dr. Williamson has garnered several Best Paper Awards. He is a Senior Member of IEEE and a distinguished lecturer of the IEEE Vehicular Technology Society.

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## **Industry Expertise**

Automotive, Consumer Electronics, Education/Learning, Electrical Engineering, Energy, Machinery, Manufacturing, Renewables and Environmental, Research, Transportation/Trucking/Railroad

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## **Topics**

Batteries, Energy Storage Systems, Electric Vehicles, Transportation, Power Electronics, Motor Drives , Electric Machines, Renewable Energy Systems, Charging , Energy Harvesting

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## **Affiliations**

Institute of Electrical and Electronics Engineers (IEEE), Professional Engineers Ontario

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## **Past Talks**

**Real-World Power Electronic Solutions for Smart (Universal) Plugged and Wireless Electric Vehicle Charging Infrastructures**

IEEE Applied Power Electronics Conference and Exposition

**Advanced Electric Energy Storage Systems and Smart Fast Charging for Future Electric Mass Transit Applications**

IEEE International Electric Vehicle Conference 2014

**Future Prospects of Power Electronic Converters for Electric Energy Storage, Energy Management, and Peak Power Applications**

2014 IEEE Canada Electric Power and Energy Conference

**Smart Energy Storage Solutions and Peak Power Management for Electric Mass Transit Transportation**

The 40th Annual Conference of the IEEE Industrial Electronics Society

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## **Education**

**Illinois Institute of Technology**

PhD Electrical Engineering

**Illinois Institute of Technology**

MS Automotive Power Electronics and Motor Drives

**University of Mumbai**

BE Electrical Engineering

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## **Accomplishments**

**Senior Member, IEEE**

Appointed Senior Member of IEEE for making significant contributions to the field of electric transportation.

### **Distinguished Lecturer of the IEEE Vehicular Technology Society**

The IEEE Vehicular Technology Society deals with land, airborne and maritime mobile services; portable commercial and citizen's communications services; vehicular electrotechnology, equipment and systems of the automotive industry; traction power, signals, communications and control systems for mass transit and railroads.

### **Associate Editor, IEEE Transactions and Journals**

Dr. Williamson is the Associate Editor of the IEEE Transactions of Power Electronics, IEEE Transactions on Industrial Electronics, IEEE Transactions on Transportation Electrification, and the IEEE Journal of Emerging and Selected Topics in Power Electronics.

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