



# ELECTRICAL + COMPUTER STORIES

FROM THE ELECTRICAL + COMPUTER ENGINEERING  
DEPARTMENT • MARQUETTE UNIVERSITY • JUNE 2019



## THE INFLUENCE OF PROFESSOR DEMERDASH

BY GLENDA OWOR

Dr. Demerdash currently serves as Professor of Electrical and Computer Engineering at Marquette University. He is also a Life-Fellow of the IEEE (Institute of Electrical and Electronic Engineers). He earned a B.Sc.E.E. degree from Cairo University, and M.S.E.E. and Ph.D. degrees from University of Pittsburgh.

Later, he worked as a Development Engineer at Westinghouse Electric Corporation before earning the

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"I DON'T  
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-Dr. Demerdash

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title of Professor from several universities such as Virginia Polytechnic Institute and State University in Virginia and Clarkson University in Potsdam, New York. He has since 1994 served as Professor at Marquette University, where he has been for 25 years. He continues to enrich the department with incredible knowledge in the fields of electric machines and drives.

Dr. Demerdash's personal accomplishments include being awarded the 1999 IEEE Nikola Tesla Technical Field Award, as well as achieving the status of Fellow of IEEE in 1990 and Life-Fellow of IEEE in 2009.



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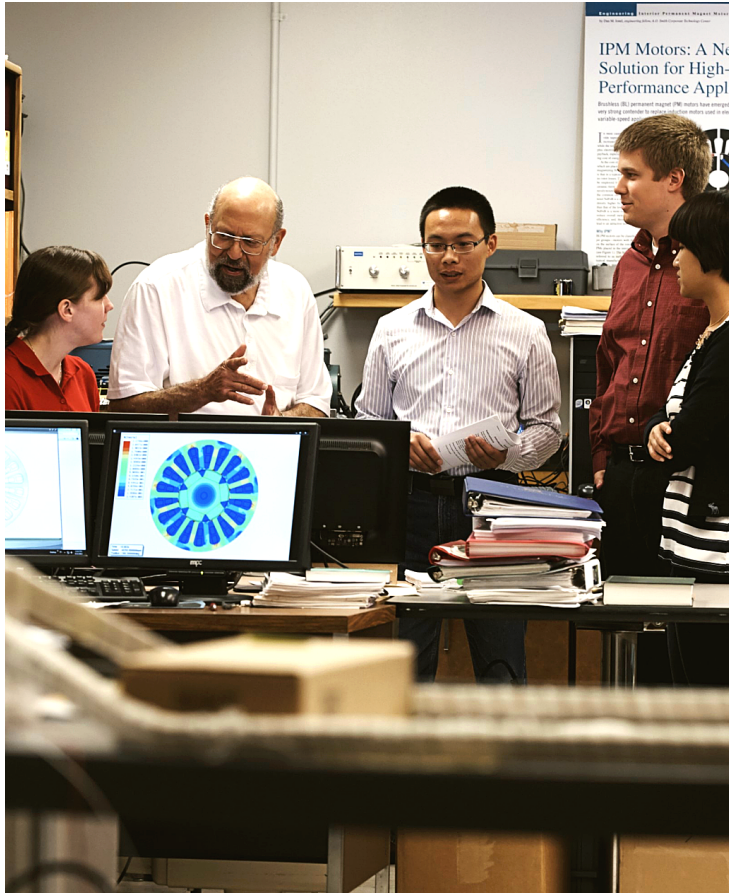
The Nikola Tesla Technical Field Award, in particular, is a distinct honor in the field of electrical engineering. It is only given out to a single recipient each year by IEEE for outstanding contributions to the generation and utilization of electric power. Each recipient is hand-picked by the IEEE Board of Directors.

**"Dr. Demerdash's renowned expertise in the field of electric machines and drive system design has only helped his popularity."**

Dr. Demerdash's innovation, leadership and commitment to this field is evidenced by his achievement of this significant honor.







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However, Dr. Demerdash is not simply the kind of Professor who keeps his work to himself. He is incredibly generous with his time, using it to pour into students and help mold them into independent and capable leaders. Dr. Demerdash calls this his 'passion'. "I don't know what I would do if I wasn't teaching," Dr. Demerdash says.

In fact, Professor Demerdash prides himself on reading each line of his students' dissertations, even taking time outside the office to connect with students over their work. "I used to invite my students over for dinner," Demerdash says. "My wife became used to me asking her to make another plate for the student." When Dr. Demerdash reviews his students' papers, he takes his time.

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One student puts it this way: 'Dr. Demerdash bleeds on these dissertations', meaning that his red marks on their papers are plentiful, and at the end of the day, reveal his in-depth care for his students' success. This involved style has paid off.

**"Dr. Demerdash bleeds on these dissertations."**

Every single dissertation Dr. Demerdash has supervised has led to three or four IEEE transactions. We will discuss some of these award-winning research papers here. To start, several of his students at Marquette have won IEEE Prize Paper Awards with the help of his mentorship.



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The first of these was co-authored by Dr. Ahmed Sayed-Ahmed and Dr. Behrooz Mirafzal. The paper is titled "Fault-Tolerant Technique for  $\Delta$ -Connected AC-Motor Drives". (Cited 78 times, June 11, 2019) This paper focuses on crafting fault-tolerant technique for induction machines, by mitigating torque pulsations and ultimately optimizing efficiency of the machines. The paper, as well as its authors, have reached success. The first example is Dr. Ahmed Sayed-Ahmed, who works as a Principal Engineer at Rockwell Automation.

The second is Dr. Behrooz Mirafzal, who serves as Associate Professor of Electrical and Computer Engineering at Kansas State University.



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The second IEEE Prize Paper from students at Marquette is called "Calculation of Magnet Losses in Concentrated-Winding Permanent Magnet Synchronous Machines Using a Computationally Efficient - Finite Element Method." (Cited 31 times, June 11, 2019)

**"Student leaders in the field of electric machines are known to flock to Dr. Demerdash."**

This paper was co-authored by Dr. Peng Zhang, Dr. Gennadi Y. Sizov and Dr. Jiangbiao He, with Dr. Demerdash as their mentoring author.





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The goal of the paper is to calculate magnet losses in concentrated-winding permanent magnet synchronous machines, in order to improve energy efficiency in these machines.

Once again, the students that have joined Dr. Demerdash in this research have been incredibly successful. For example, Dr. Zhang currently works as a Principle Engineer at General Motors in Research and Development, while Dr. Gennadi Y. Sizov, works at Rockwell Automation as a Project Motor Development Engineer. The last co-author, Dr. Jiangbiao He, serves as Assistant Professor of Electrical and Computer Engineering at the University of Kentucky.

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Dr. Jiangbiao He also recently won the 2019 IEEE-Industry Application Systems (IAS) Andrew W. Smith Outstanding Young Member Achievement Award.

The final and most recent IEEE Prize Paper won by Dr. Demerdash and his advisees is entitled, "Computationally Efficient Strand Eddy Current Loss Calculation in Electric Machines." (Cited 8 times, June 11, 2019) This paper is currently scheduled for print in the July-August 2019 Issue of the IEEE Industry Applications Transactions. Dr. Alireza Fatemi lead-authored this paper, with Dr. Demerdash as the mentoring author.

**"Dr. Demerdash has a sincere passion for mentorship and development."**

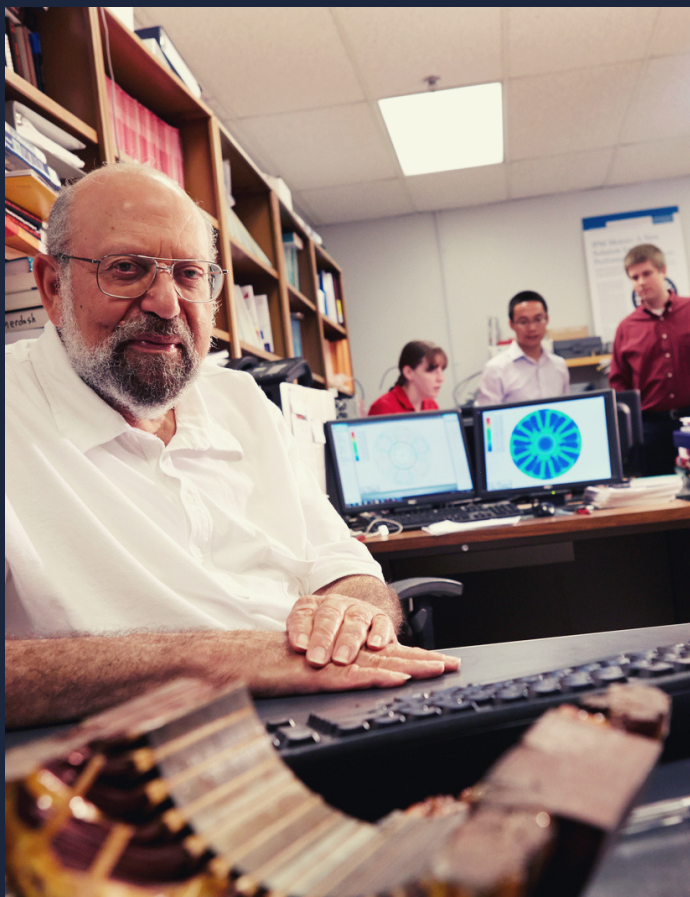
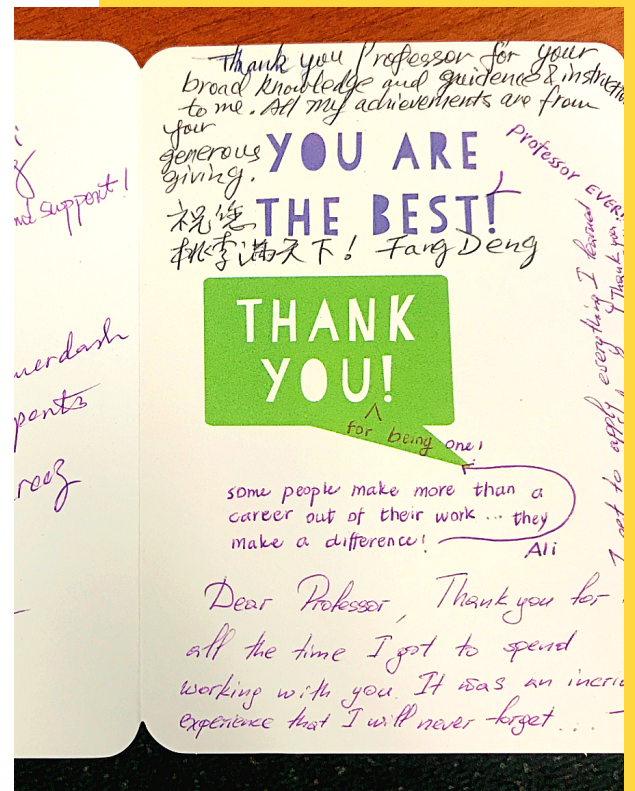




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It focuses on loss calculation in electric machines in order to optimize energy efficiency. In yet another instance, Dr. Demerdash's close mentorship over Dr. Fatemi's life has paid dividends. This is evidenced by Dr. Alireza Fatemi's current position. He serves as an Electric Machines, Power Electronics, and Energy Systems Research Engineer in Research and Development at General Motors.

This level of scholarship and skill can be found at many colleges, but what sets Dr. Demerdash and several other Marquette professors apart is their commitment to the individual student. Dr. Demerdash has a sincere passion for mentorship and development for each of his students.



## THE INFLUENCE OF PROFESSOR DEMERDASH

Additionally, Dr. Demerdash's renowned expertise in the field of electric machines and drive system design has only helped his popularity.

**"Dr. Demerdash's efforts have resulted in successful engineers, winsome leaders... and life-long mentorships."**

Student leaders in the field of electric machines are known to flock to Dr. Demerdash specifically; to learn from his sophisticated research findings and methodology in the field. Dr. Demerdash's efforts have resulted in successful engineers, winsome leaders in their respective fields and perhaps most importantly, life-long mentorships between Dr. Demerdash and those he has reached. These collaborative mentorships continue to this day.