Short Biography

Prof. Toliyat received the B.S, degree from Sharif University of Technology, Tehran, Iran in 1982, the M.S. degree from West Virginia University, Morgantown, WV in 1986, and the Ph.D. degree from University of Wisconsin-Madison, Madison, WI in 1991, all in electrical engineering. Following receipt of the Ph.D. degree, he joined the faculty of Ferdowsi University of Mashhad, Mashhad, Iran as an Assistant Professor of Electrical Engineering. In March 1994 he joined the Department of Electrical and Computer Engineering, Texas A&M University where he is currently Raytheon endowed professor of electrical engineering.

Dr. Toliyat has received the prestigious **Nikola Tesla Field Award** for "outstanding contributions to the design, analysis and control of fault-tolerant multiphase electric machines" from IEEE in 2014, the Cyrill Veinott Award in Electromechanical Energy Conversion from the IEEE Power Engineering Society in 2004, Patent and Innovation Award from Texas A&M University System Office of Technology Commercialization's in 2020, 2018, 2016 and 2007, TEES Faculty Fellow Award in 2006, Distinguished Teaching Award in 2003, E.D. Brockett Professorship Award in 2002, Eugene Webb Faculty Fellow Award in 2000, and Texas A&M Select Young Investigator Award in 1999. He has also received the Space Act Award from NASA in 1999, and the Schlumberger Foundation Technical Awards in 2001 and 2000.

Prof. Toliyat work is highly cited by his colleagues more than 26,000 times and has an H-index of 78. Dr. Toliyat was an Editor of IEEE Transactions on Energy Conversion. He was Chair of the IEEE-IAS Industrial Power Conversion Systems Department of IEEE-IAS, and is a member of Sigma Xi. He is a fellow of the IEEE, the recipient of the 2008 Industrial Electronics Society Electric Machines Committee Second Best Paper Award as well as the recipient of the IEEE Power Engineering Society Prize Paper Awards in 1996 and 2006, and IEEE Industry Applications Society Transactions Third Prize Paper Award and Second Prize Paper Award in 2006 and 2016, respectively. His main research interests and experience include analysis and design of electrical machines, variable speed drives for traction and propulsion applications, fault diagnosis of electric machinery, and magnetic gear integrated electric machines. Prof. Toliyat has supervised more than 120 graduate students, post docs, and research engineers. He has published over 510 technical papers, presented more than 99 invited lectures all over the world, and has 34 issued and pending US patents. He is the author of 11 books and book chapters including DSP-Based Electromechanical Motion Control, CRC Press, 2003, the co-editor of Handbook of Electric Motors - 2nd Edition, Marcel Dekker, 2004, and the co-author of Electric Machines – Modeling, Condition Monitoring, and Fault Diagnosis, CRC Press, Florida, 2013.

He was the General Chair of the 2005 IEEE International Electric Machines and Drives Conference in San Antonio, Texas. Dr. Toliyat is a Professional Engineer in the State of Texas.

Resume

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Patents, Patent Applications and Patent Disclosures:

1. Methods and Apparatus for Medium-Voltage Electronic Power Conversion, **H.A. Toliyat**, and M. Moosavi, **United States Patent No.: 10,998,825**, May 4, 2021.
2. Method and Apparatus for Compact Axial Field Magnetically Geared Machines, **H.A. Toliyat**, M. Johnson, and M. Gardner, **United States Patent No. 10,476,349 B2**, Nov. 11, 2019.
3. Sparse and Ultra-Sparse Partial Resonant Converters, **H.A. Toliyat**, and M. Amirabadi, **United States Patent No.: 9,543,853 B2**, Jan. 10, 2017.
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5. DC Capacitors-Less Power Converters, **H.A. Toliyat**, and M. Amirabadi, **United States Patent No.: 8,988,900 B2,** Mar. 24, 2015.
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7. Multiphase Induction Motor Drive System and Method, **H.A. Toliyat**, R. Shi, H. Xu, **United States Patent No.: 6,426,605 B1**, July 30, 2002.
8. Methods and Apparatus for Medium-Voltage Electronic Power Conversion, **H.A. Toliyat**, and M. Moosavi, **United States Patent Application No.: US 2019/0252989 A1**, Aug. 15, 2019.
9. Method and Apparatus for Compact Axial Field Magnetically Geared Machines, **H.A. Toliyat**, M. Johnson, and M. Gardner, **International Application WO 2017/062654 A1**, April 13, 2017.
10. System and Method for Controlling Multiphase Electric Motors, **H.A. Toliyat**, M. Hajiaghajani, V. Sundaram, Y. Deshpande, M.M. Rahimian, and N. Nzeocha, **United States Patent Application No.: 2015/0270747 A1**, Sep. 24, 2015.
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30. Condition Monitoring and Fault Diagnosis of Electric Motors and Generators Apparatus and Methods, **H.A. Toliyat**, and B. Akin, TAMUS 2495, Feb. 22, 2007.

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33. Fault Tolerant Permanent Magnet Motor Drives with High Specific Torque, **H.A. Toliyat**, L. Parsa, 2093TEES04, November 2003.
34. A Multiphase Synchronous Reluctance Motor Drive with High Specific Torque, **H.A. Toliyat**, and R. Shi, TAMUS 1589, April 2000.
35. A Four-quadrant Soft-switched Brushless Permanent Magnet Motor Drive and Method, **H.A. Toliyat**, J.C. Moreira, S. Waikar, and M.S. Arefeen, TAMUS 1567, March 2000.

Books:

1. **Electric Machines – Modeling, Condition Monitoring, and Fault Diagnosis**, H.A. Toliyat, S. Nandi, S. Choi, and H. Meshgin-Kelk, CRC Press, Florida, 2013, 272 pages.
2. **DSP-Based Electromechanical Motion Control**, H.A. Toliyat, S. Campbell, CRC Press, Florida, 2003, 344 pages.
3. **Handbook of Electric Motors**, H.A. Toliyat, G. Kliman, 2nd Edition, Marcel Dekker, New York, 2004, 805 pages.
4. **Electric Machines – Modeling, Condition Monitoring, and Fault Diagnosis**, H.A. Toliyat, S. Nandi, S. Choi, and H. Meshgin-Kelk, CRC Press, in Chinese, 2015.

Books Chapters:

5. Contributor to Compendium on Electromagnetic Analysis, Editor: Y. Sozer, World Scientific, 2020, pp. 389-420.
6. Contributor to Power Electronic Converters and Systems – Frontiers and applications, Edited by A.M. Trzynadlowski, IET Press, 2016, pp. 75-110.
7. Contributor to Power Electronics for Renewable Energy Systems, Transportation and Industrial Applications, H. Abu-Rub et al., Wiley & Sons, 2014, pp. 107-135.
8. Contributor to the Third Edition of: Power Electronics Handbook", Muhammad H. Rashid, Butterworth-Hinemann Publishing, 2011, pp. 1155-1176.
9. Contributor to the Second Edition of: Power Electronics Handbook", Muhammad H. Rashid, Academic Press, 2006.
10. Contributor to "The Power Electronics Handbook", Timothy L. Skvarenina, Editor-in-chief, CRC Press, 2002.
11. Contributor to "Comprehensive Dictionary of Electrical Engineering", Phillip Laplante, Editor-in-chief, CRC Press, 1999.

Professional Interests:

1. Electric and Hybrid Electric Vehicles
2. Motors and generators, high speed, medium voltage, etc.

3. Auxiliary power generators
4. Condition monitoring and fault diagnosis of electric machinery
5. Sensors and Sensorless electric motor drive and spindle motors
6. Submersible motors and downhole equipment.
7. Magnetic gears
8. DSP-based power electronics systems
9. Novel electric machines for different applications
10. Electromechanical energy storage systems
11. Uninterruptible power supplies (UPS)
12. Power supplies
13. Power converters for electric machines including multilevel converters.
14. Distributed Energy Systems; Wind Mills, Microturbine, Solar
15. Smart Grids and their components
16. Active power filters for power systems network
17. Fuel cell operated electric motor drives

Educational Background:

Ph.D. in Electrical Engineering with specialization in Industrial Drives, Electrical Machines, Power Electronics, Power Systems and Control.

Ph.D. Dissertation: Analysis of Concentrated Winding Induction and Reluctance Motors for Adjustable Speed Drive Applications, University of Wisconsin-Madison, Madison, Wisconsin, USA; May 19, 1991

M.S. in Electrical Engineering
M.S. Thesis: Damping of Natural Mechanical Oscillations Using DC Modulation in a Multiterminal AC/DC System, West Virginia University, Morgantown, West Virginia, USA; May 1986

B.S. in Electrical Engineering
Sharif University of Technology, Tehran, Iran; May 1982

Teaching:

I stress the use of interdisciplinary ideas in my teaching. Rather than teaching students to specialize in a narrow area, I try to provide valuable perspective on how ideas relate with concepts students have already seen in other classes. With these interdisciplinary goals in mind, I have purposely taught courses in two different areas within my department: power electronics, and electric machinery. I have developed and taught three new courses in the area of electromechanical motion devices. These are:

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