

## 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 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 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.

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 the 2006 IEEE Industry Applications Society Transactions Third Prize Paper Award. 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 sensorless variable speed drives. Prof. Toliyat has supervised more than 80 graduate students, post docs, and research engineers. He has published over 420 technical papers, presented more than 80 invited lectures all over the world, and has 15 issued and pending US patents. He is the author of DSP-Based Electromechanical Motion Control, CRC Press, 2003, the co-editor of Handbook of Electric Motors - 2<sup>nd</sup> 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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**Residence:**

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College Station, TX 77845  
Phone: (979) 690-6908

**Residency Status:**

US Citizen

**Professional Engineer in the State of Texas, P.E. # 97974**

**Patents:**

1. 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.
2. A Low-Cost Brushless DC Motor Drive with Improved Power Factor, **H.A. Toliyat**, and T. Gopalarathnam, United States Patent No.: 7,049,786, May 23, 2006.
3. A New Motor Drive Technology for Downhole ESPs Applications, **H.A. Toliyat**, Y. Deshpande, V. Sundaram and M. Rahimian (TAMU), M. Hajiaghajani, , and N. Nzeocha (Chevron), U.S. Provisional Patent Application., Nov. 2013.
4. DC Capacitors-Less Power Converters Apparatus and Method, **H.A. Toliyat**, and M. Amirabadi, TAMUS 3282, Nov. 2, 2010, U.S. Provisional Patent Application Serial No 61/493,210, June 3, 2011.
5. Ultra-Sparse Partial Resonant AC-Link Inverter, **H.A. Toliyat**, and M. Amirabadi, TAMUS 3762, Dec. 3, 2012, Provisional Patent Application No.: 61/831,446, June 5, 2013.
6. Permanent Magnet Motor Full Speed Range Control Method and Apparatus, **H.A. Toliyat**, L. Hao, and L. Parsa, TAMUS 1984, January 2003, U.S. Provisional Patent Application Serial No. 60/542,770, Filing Date: February 6, 2004.
7. System, Apparatus and Method for Driving a Permanent Magnet Motor, **H.A. Toliyat**, R. Khopkar, S.M. Madani, M. Hajiaghajani, TAMUS 2143, May 2004, U.S. Provisional Patent Application Serial No 60/575,928.
8. High-Frequency-Link Power Converter Topologies with soft-switching Operation, **H.A. Toliyat**, and H. Keyhani, TAMUS 3974, January 30, 2014.
9. Damper Windings for the Magnetic Gear, **H.A. Toliyat**, and N. Frank, TAMUS 3279, Oct. 27, 2010.
10. Condition Monitoring and Fault Diagnosis of Electric Motors and Generators Apparatus and Methods, **H.A. Toliyat**, and B. Akin, TAMUS 2495, Feb. 22, 2007.
11. An Integrated Alternator/Active Filter for Wind Power Applications, **H.A. Toliyat**, M.T. Abolhassani, TAMUS2376, April 2006.
12. Current Source Inverter with Simple Commutation Method and Apparatus, **H.A. Toliyat**, and S. Kwak, TAMUS 2130, April 2004.

13. Fault Tolerant Permanent Magnet Motor Drives with High Specific Torque, **H.A. Toliyat**, L. Parsa, 2093TEES04, November 2003.
14. A Multiphase Synchronous Reluctance Motor Drive with High Specific Torque, **H.A. Toliyat**, and R. Shi, TAMUS 1589, April 2000.
15. 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 - Chinese version is scheduled for publication in 2015.
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.

**Books Chapters:**

4. Contributor to the Third Edition of: "Power Electronics Handbook", Muhammad H. Rashid, Butterworth-Hinemann Publishing, 2011.
5. Contributor to the Second Edition of: "Power Electronics Handbook", Muhammad H. Rashid, Academic Press, 2006.
6. Contributor to "The Power Electronics Handbook", Timothy L. Skvarenina, Editor-in-chief, CRC Press, 2002.
7. Contributor to "Comprehensive Dictionary of Electrical Engineering", Phillip Laplante, Editor-in-chief, CRC Press, 1999.

**Professional Interests:**

1. Consulting in related fields and serving as an expert witness
2. Uninterruptible power supplies (UPS)
3. Power supplies
4. Power converters for electric machines including multilevel converters.
5. Distributed Energy Systems; Wind Mills, Microturbine, Solar
6. Smart Grids and their components
7. Motors and generators, high speed, medium voltage, etc.
8. Auxiliary power generators
9. Submersible motors and downhole equipment.
10. Sensors and Sensorless electric motor drive and spindle motors
11. DSP-based power electronics systems

12. Novel electric machines for different applications
13. Condition monitoring and fault diagnosis of electric machinery
14. Electric and Hybrid Electric Vehicles
15. Electromechanical energy storage systems
16. Active power filters for power systems network
17. Magnetic gears
18. 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 four new courses in the area of electromechanical motion devices. These are:

1. **ECEN 611 General Theory of Electromechanical Motion Devices, 3 credits**
2. **ECEN 612 Computer Aided Design of Electromechanical Motion Devices, 3 credits**
3. **ECEN 442 DSP-Based Electromechanical Motion Control, 3 credits**
4. **ECEN 689 Advanced DSP-Based Electromechanical Motion Control, 3 credits**

August 2003- Present

Professor of Electrical & Computer Engineering,

Teaching undergraduate and graduate courses and performing research in Power Electronics and Electric Machinery, Texas A&M University, College Station, TX.

August 2000- August 2003

Associate Professor of Electrical Engineering

January 1995- August 2000

Assistant Professor, of Electrical Engineering

March 1994- December 1994

Visiting Assistant Professor, Teaching Power Electronics and Electric Machines and performing research in the related fields, Texas A&M University, College Station, TX.

September 1991 - January 1994

Assistant Professor, Electrical Machines, Teaching Power Electronics, Modern Control courses at Graduate and Senior Undergraduate levels, conducting research in the related fields, developed two graduate courses in the area of electrical machinery and power electronics, Ferdowsi University of Mashhad, Mashhad, Iran.

September 1990 - December 1990

Teaching Assistant, ECE 504, "Electric Machine & Drive System Laboratory", 2-3 credits, senior/graduate course, UW-Madison, Madison, WI, USA

June 1990 - August 1990

Teaching Assistant, ECE 306, "Linear active Circuits Laboratory", 1 credit, UW-Madison.

January 1990 - May 1990

Lecturer, ECE 511, "Analysis and Control of Synchronous Machines", 3 credits, senior/graduate course, UW-Madison.

September 1987 - December 1989

Lecturer, ECE 375, "Electrical Engineering Laboratory II", UW Madison.

September 1979 - June 1980

Teaching Assistant of Electrical Measurement Laboratory, Sharif University of Technology, Tehran, Iran.

**Industrial Experience:**

January 1991 - May 1991

General Motors Corporation, Electro-Motive Division, LA Grange, IL, USA

Worked on the EMD research project on the design of a concentrated winding machine for a DC locomotive traction alternator.

June 1989 - September 1989

Allen-Bradley Company, Motion Control Division, Milwaukee, WI, USA

Worked on the improvement of a new product called: "High Performance AC Drive, Bulletin 1336".

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