

## Resume of Steven B. Leeb

Office Address: MIT Room 10-069, Cambridge, MA 02139, (617) 253-9360

### Education:

Ph.D. degree, Massachusetts Institute of Technology, 1993  
E.E. degree, Massachusetts Institute of Technology, 1990  
S.M. degree, Massachusetts Institute of Technology, 1989  
S.B. degree, Massachusetts Institute of Technology, 1987

### Experience:

MacVicar Professor of Electrical Engineering and Computer Science and Mechanical Engineering, Massachusetts Institute of Technology 2005 – Present  
(Classes taught include: Feedback Control Systems, Signals and Systems, Circuits, Advanced Mechatronics Project Laboratory, Fields and Forces, Introduction to Power Systems, Motor Design)  
Associate Professor of Electrical Engineering, Massachusetts Institute of Technology 1997 – June 2005  
Assistant Professor of Electrical Engineering, Massachusetts Institute of Technology 1993—1997  
Lieutenant, U.S. Air Force Reserve, Wright Research and Development Center, Microelectronics Branch (part time) 1987—1991

### Honors:

AT&T New Ventures Grant 1993  
MIT Leader's for Manufacturing Program Junior Faculty Fellow 1993—1996  
Spira Teaching Award 1996  
Bose Teaching Award 1997  
Edgerton Faculty Award 1998  
Technology Review's TR100 Outstanding Young Innovator 1999  
IEEE Outstanding Young Power Electronics Engineer 1999  
R&D 100 Award, 2000  
IEEE Senior Member, 2001  
R&D 100 Award, 2002  
MIT MacVicar Fellow, 2004  
Eta Kappa Nu EECS Undergraduate Teaching Award, 2006  
IEEE Fellow, 2007

### Short Biography:

Steven B. Leeb received his Bachelor of Science, Master of Science, Electrical Engineer, and Doctoral degrees from the Massachusetts Institute of Technology in 1987, 1989, 1990, and 1993, respectively. He has been a member on the M.I.T. faculty in the Department of Electrical Engineering and Computer Science since 1993. He currently serves as MacVicar Fellow and Professor of Electrical Engineering and Computer Science in the Laboratory for Electromagnetic and Electronic Systems. In his capacity as a Professor at M.I.T, he is concerned with the design, development, and maintenance processes for all kinds of machinery with electrical actuators, sensors, or power electronic drives. He is the author or co-author of over 80 publications and 13 US Patents in the fields of electromechanics and power electronics.

### Sample Publications:

1. Shaw, S.R., S.B. Leeb, "Identification of Induction Motor Parameters from Transient Stator Current Measurements," *IEEE Transactions on Industrial Electronics*, Volume 46, No. 1, February 1999, pp. 139-149.
2. Shaw, S.R., R.F. Lepard, S.B. Leeb, and C.R. Laughman, "A Power Quality Prediction System," *IEEE Transactions on Industrial Electronics*, Volume 47, No. 3, June 2000, pp. 511-517.
3. Jackson, D.K., S.B. Leeb, S.R. Shaw, "Adaptive Control of Power Electronic Drives for Servomechanical Systems," *IEEE Transactions on Power Electronics*, Volume 15, No. 6, November 2000, pp. 1045-1055.
4. Burke, D.T., S.B. Leeb, R.T. Hinman, E.C. Lupton, J. Burke, J.C. Schneider, B. Ahangar, K. Simpson, E.A.K. Mayer, "Using Talking Lights to Assist Brain-Injured Patients with Daily Inpatient Therapeutic Schedule," *The Journal of Head Trauma Rehabilitation*, Volume 16, No. 3, June 2001, pp. 284-291.
5. Shaw, S.R., D. Luo, L.K. Norford, S.B. Leeb, "Detection of HVAC Faults via Electrical Load Monitoring," *International Journal of HVAC&R Research*, Volume 8, No. 1, January 2002, pp.13-40.
6. Luo, D., L.K. Norford, S.R. Shaw, S.B. Leeb, "Monitoring HVAC Equipment Electrical Loads from a Centralized Location Methods and Field Test Results," *ASHRAE Transactions*, Volume 108, Part 1, January 2002.
7. Jackson, D.K., S.B. Leeb, "A Digitally Controlled Amplifier with Ripple Cancellation," *IEEE Transactions on Power Electronics, Special Issue on Digital Control*, Volume 18, Number 1, Part 2, January 2003, pp. 486-494.
8. Shaw, S.R., M. Keppler, S.B. Leeb, "Pre-Estimation for Better Initial Guesses," *IEEE Transactions on Instrumentation and Measurement*, Volume 53, No. 3, June 2004, pp. 762-769.
9. Lee, K.D., S.B. Leeb, L.K. Norford, P. Armstrong, J. Holloway and S.R. Shaw,

- “Estimation of Variable Speed Drive Power Consumption from Harmonic Content,” *IEEE Transactions on Energy Conversion*, Volume 20, No. 3, September 2005, pp. 566-574.
10. Armstrong, P.R. C.R. Laughman, S.B. Leeb, and L.K. Norford, “Detection of Rooftop Cooling Unit Faults Based on Electrical Measurements,” *International Journal of HVAC&R Research*, Volume 12, No. 1, January 2006, pp.151-176.
  11. Armstrong, P.R., S.B. Leeb, L.K. Norford, “Control with Building Mass – Part 1: Thermal Response Model,” *ASHRAE Transactions*, Volume 112, Part 1, 2006.
  12. Armstrong, P.R., S.B. Leeb, L.K. Norford, “Control with Building Mass – Part 2: Simulation,” *ASHRAE Transactions*, Volume 112, Part 1, 2006.
  13. Zhu, T., S.R. Shaw, S.B. Leeb, “Transient Recognition Control for Hybrid Fuel Cell Systems,” *IEEE Transactions on Energy Conversion*, Volume 21, No. 1, March 2006, pp. 195-201.
  14. Rodriguez, J.I., S.B. Leeb, “A Multilevel Inverter Topology for Inductively Coupled Power Transfer,” *IEEE Transactions on Power Electronics*, Volume 21, No. 6, November 2006, pp. 1607-1617.
  15. Mitchell, G.R., R.W. Cox, J. Paris, S.B. Leeb, “Shipboard Fluid System Diagnostic Indicators Using Non-Intrusive Load,” *Naval Engineer’s Journal*, Volume 119, No. 1, November, 2007.
  16. Shaw, S.R., S.B. Leeb, L.K. Norford, R.W. Cox, “Nonintrusive Load Monitoring and Diagnostics in Power Systems,” *IEEE Transactions on Instrumentation and Measurement*, Volume 57, No. 7, July 2008, pp. 1445-1454.
  17. Wichakool, W., A. Avestruz, R.W. Cox, S.B. Leeb, “Modeling and Estimating Current Harmonics of Variable Electronic Loads,” *IEEE Transactions on Power Electronics, Special Issue*, Volume 24, No. 12, December, 2009, pp. 2803-2811.
  18. Proper, E., Cox, R., Leeb, S., Douglas, K., Paris, J., Wichakool, W., Foulks, L., Jones, R., Branch, P., Fuller, A., Leghorn, J., Elkins, G., “Field Demonstration of a Real-Time Non-Intrusive Monitoring System for Condition-Based Maintenance,” *Electric Ship Design Symposium*, National Harbor, Maryland, February 2009.
  19. Paris, J., Remscrim, Z., Douglas, K., Leeb, S., et. al., “Scalability of Non-Intrusive Load Monitoring for Shipboard Applications,” ASNE Day 2009, National Harbor, Maryland, April, 2009. \*\*
  20. Laughman, C.R., Leeb, S.B., Norford, L.K., Shaw, S.R., Armstrong, P.R., “A Two-Step Method for Estimating the Parameters of Induction Machine Models,” *IEEE Energy Conversion Conference and Exposition*, San Jose, CA, September 2009. \*\*
  21. Clifford, Z., Cooley, J., Avestruz, A., Remscrim, Z., Vickery, D., Leeb, S.B., “A Retrofit 60 Hz Current Sensor for Non-intrusive Power Monitoring at the Circuit Breaker,” *Applied Power Electronics Conference*, Palm Springs, CA, February, 2010.

22. Orji, U., Remscrim, Z., Laughman, C., Leeb, S.B., Wichakool, W., Schantz, C., Cox, R., Paris, J., Kirtley, J.L., Norford, L.K., "Fault Detection and Diagnostics for Non-Intrusive Monitoring using Motor Harmonics," *Applied Power Electronics Conference*, Palm Springs, CA, February, 2010.
23. Remscrim, Z., Paris, J., Leeb, S.B., Shaw, S.R., Neuman, S., Schantz, C., Muller, S., Page, S., "FPGA-Based Spectral Envelope Preprocessor for Power Monitoring and Control," *Applied Power Electronics Conference*, Palm Springs, CA, February, 2010.
24. Wichakool, W, Paris, J., Avestruz, A., Leeb, S.B., "High-resolution Physically-windowed Sensors for Power Electronics Applications," *Applied Power Electronics Conference*, Palm Springs, CA, February, 2010.
25. Cooley, J.J., Seger, E., Leeb, S.B., Shaw, S., "Characterization of a 5 kW Solid Oxide Fuel Cell Stack Using Power Electronic Excitation," *Applied Power Electronics Conference*, Palm Springs, CA, February, 2010.
26. Cooley, J.J., Vickery, D., Avestruz, A., Englehart, A., Paris, J., Leeb, S.B., "Solid-State Lamp with Integral Occupancy Sensor," *Applied Power Electronics Conference*, Palm Springs, CA, February, 2010.
27. Leeb, S., Kirtley, J.L. Wichakool, W., Remscrim, Z., Tidd, C., Goshorn, A., Thomas, K., Cox, R., Chaney, R, "How Much DC Power is Necessary?," ASNE Day 2010, Crystal City, Arlington, VA, April 2010.