Patrick L. Chapman

Associate Professor
University of Illinois at Urbana-Champaign
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Education		
Degree	**University**	**Year**
Ph.D., Electrical Engineering	Purdue University	2000
M.S., Electrical Engineering	University of Missouri-Rolla	1997
B.S., Electrical Engineering (with Honors)	University of Missouri-Rolla	1996

Employment		
Position	**Employer**	**Year**
Associate Professor (with tenure)	University of Illinois at Urbana-Champaign (UIUC)	2007-
Assistant Professor	UIUC	2001-2007
Visiting Assistant Professor	UIUC	2000-2001
Part-Time and Major Consulting Activities		
Chief Technology Officer, Treasurer	SmartSpark Energy Systems, Inc. (SSES)	2003-
Director	SSES	2003-2007
Consultant	Magna-Power Electronics	2005
Engineer	P.C. Krause and Associates	1995-2000

Awards and Recognition		
Award	**Granted by**	**Year**
Distinguished Young Alumnus Award	Miner Alumni Association (University of Missour-Rolla)	2009
Technology Transfer Award	Champaign County Economic Development Center	2009
Richard M. Bass Outstanding Young Power Electronics Engineer	Institute of Electrical and Electronics Engineers (IEEE) Power Electronics Society (PELS)	2006
Young Investigator Award	Office of Naval Research (ONR)	2005
CAREER Award	National Science Foundation (NSF)	2002
Grainger Associate	Grainger Foundation	2002-

Publications Overview		
Type	**Publication**	**Articles**
Journal	*IEEE Transactions on Power Electronics*, on *Energy Conversion*, on *Industrial Electronics*, on *Circuits and Systems*, and several others	35
Conference	Many IEEE and other conferences, including *APEC*, *PESC*, *IAS*, *INTELEC*, *VPPC*, etc.	72

Intellectual Property	U.S. Patents	2
Other	Magazines, newsletters, presentations, technical reports, etc.	~20

Professional Interests	
Research	Power electronics, electric machines and drives, solar power, wind energy, energy harvesting, power on chip, simulation, design optimization
Teaching	Power electronics, machines, drives, renewable energy, circuits
Service	Journal editing, IEEE conferences and committees, NSF and other government review panels, community outreach, student team projects
Economic Development	Startup company, intellectual property development, energy efficiency

Student Advising	
Post-docs	1
Ph.D.	7 graduated, 3 matriculating
Master of Science	14 graduated, 5 matriculating
Undergraduate	16-20 mentees
Undergraduate Research	2 senior theses, many research assistants
Team Projects	Co-advised IEEE Future Energy Challenge (2003), Advised Department of Energy (DOE) Solar Decathlon (2007, 2009).

Funded Research		
Instrument	**Agencies**	**Total Funding**
Grants	NSF, ONR, Illinois Clean Energy Community Foundation, Illinois Department of Transportation	~$2.1M
Contracts	DOE, California Energy Commission, INI Power Systems, Intel, SSES, Odyssian Technologies, Northrop Grumman Space Technologies (NGST), Motorola, Silverstein Properties	~$1.0M
Gifts	NGST, Advanced Analogic Technologies, Texas Instruments, UIUC Power Affiliates Program	~$100k
Endowments	Associate Director Grainger Center for Electric Machines and Electromechanics	~$100k/yr

Professional Service		
Activity	**Affiliation**	**Years**
Editor-in-Chief	*IEEE Transactions on Power Electronics* (Letters)	2006-2007
Editor	*IEEE Transactions on Energy Conversion*	2007-
Associate Editor	*IEEE Transactions on Power Electronics*	2003-2005
Guest Associate Editor	*IEEE Transactions on Industrial Electronics*	2008-2009

Program Chair	*IEEE Computers in Power Electronics Workshop*	2004
Assistant Program Chair	*IEEE Applied Power Electronics Conference* (APEC)	2008-2009
Publications Chair	APEC	2006-2008
Publications Chair	IEEE Electric Ship Technologies Symposium	2005, 2007
At-Large Member	IEEE PELS Administrative Committee	2006-
Branch Counselor	IEEE Student Branch, UIUC	2007-
Panelist	NSF proposal panels	2003, 2004, 2006, 2008
Panelist	United States Department of Agriculture (USDA) small business proposal panels	2004, 2005, 2007
Panel Manager	USDA small business proposal panels	2008-2009
Member	UIUC ECE Power and Energy, Curriculum, Graduate, and Fellowship Committees; UIUC College of Engineering Energy Subcommittee	At various times, 2000-

Journal Publications

1. P.L. Chapman, S.D. Sudhoff, "Multiple Reference Frame Analysis of Non-sinusoidal Brushless DC Drives," SAE Transactions, Vol. 107, Section 1, 1998, pp. 145-153.
2. J. L. Tichenor, P. L. Chapman, S. D. Sudhoff, R. Budzinski, "Analysis of Generically Configured PSC Induction Machines," IEEE Transactions on Energy Conversion, v14, n1, pp. 108-114, March 1999.
3. P. L. Chapman, S. D. Sudhoff, C. A. Whitcomb, "Multiple Reference Frame Analysis of Non-sinusoidal Brushless DC Drives," IEEE Transactions on Energy Conversion, v14, n3, pp. 440-446, September 1999.
4. P. L. Chapman, S. D. Sudhoff, C. A. Whitcomb, "Optimal Control Strategies for Non-Sinusoidal Permanent-Magnet Synchronous Machine Drives," IEEE Transactions on Energy Conversion, v14, n4, pp. 1043-1050, December 1999.
5. P. L. Chapman, S. D. Sudhoff, "A Multiple Reference Frame Synchronous Estimator/Regulator," IEEE Transactions on Energy Conversion, v15, n2, pp. 197-202, June 2000.
6. P. L. Chapman, S. D. Sudhoff, "Design and Precise Realization of Optimized Current Waveforms for an 8/6 Switched Reluctance Motor Drive," IEEE Transactions on Power Electronics, Vol. 17, No. 1, pp. 76-83, January 2002.
7. S. D. Sudhoff, D. Aliprantis, B.T. Kuhn, P. L. Chapman, "An Advanced Induction Machine Model for Predicting Inverter-Machine Interaction," IEEE Transactions on Energy Conversion, Vol. 17, No. 2, pp. 203-210, June 2002.
8. S. D. Sudhoff, B. T. Kuhn, D. Aliprantis, and P. L. Chapman, "Experimental Characterization Procedure for Use with an Advanced Induction Machine Model," IEEE Transactions on Energy Conversion, vol. 18, no. 1, pp. 48-56, March 2003.

9. J. Zou, C. Liu, D. Trainor, J. Chen, J. Schutt-Aine, and P. L. Chapman, "Development of Three-Dimensional Inductors Using Plastic Deformation Magnetic Assembly (PDMA)," IEEE Transactions on Microwave Theory and Techniques, vol. 51, no. 4, pp. 1067-1075, April 2003.
10. B. G. Dobbs and P. L. Chapman, "A multiple-input dc-dc converter," IEEE Power Electronics Letters, vol. 1, no. 1, pp. 6-9, March 2003.
11. A. Kwasinski, P. T. Krein, and P. L. Chapman, "Time Domain Comparison of Pulse-Width Modulation Schemes," accepted to IEEE Power Electronics Letters, vol. 1, no. 3, pp. 64-68, September 2003.
12. A.P. Wu and P. L. Chapman, "Simple Expressions for Optimal Current Waveforms for Permanent-Magnet Synchronous Machine Drives," IEEE Transactions on Energy Conversion, vol. 20, no. 1, pp. 151-157, 2005.
13. J. Kimball, T.L. Flowers, P.L. Chapman, "Issues with low-input-voltage boost converter design," IEEE Power Electronics Letters, vol. 2, no. 3, pp. 96-99, September 2004.
14. R. Balog, Z. Sorchini, J.W. Kimball, P.L. Chapman, P.T. Krein, "Modern Labarotory Based Education for Power Electronics and Electric Machines," IEEE Transactions on Power Systems, vol. 20, no. 2, pp. 538-547, May 2005.
15. S. Musunuri, P. L. Chapman, J. Zou, and C. Liu, "Design Issues for Monolithic Dc-Dc Converters," IEEE Transactions on Power Electronics, vol. 20, no. 3, pp. 639-649, May 2005.
16. J. D. Owens and P. L. Chapman, "Automatic generation of accurate low-order models for magnetic devices," IEEE Transactions on Power Electronics, vol. 20, no. 4, pp. 732-742, July 2005.
17. T. Esram, P.L. Chapman, "Comparison of photovoltaic array maximum power point tracking methods," IEEE Transactions on Energy Conversion, vol. 22, no. 2, pp. 439-449, June 2007.
18. J.R. Wells, B.M. Nee, P.L. Chapman, P.T. Krein, "Harmonic elimination control: a more general formulation and new solutions," IEEE Transactions on Power Electronics, vol. 20, no. 6, pp. 1337-1345, Nov. 2005.
19. N. Benavides, P.L. Chapman, "Power budgeting of a multiple-input buck-boost converter," IEEE Transactions on Power Electronics, vol. 20, no. 6, pp. 1303-1309, Nov. 2005.
20. S. Musunuri, P.L. Chapman, "Improvement of light-load efficiency using width-switching scheme for CMOS transistors," IEEE Power Electronics Letters, vol. 3, no. 3, pp. 105-110, Sept. 2005.
21. T. Esram, J.W. Kimball, P.T. Krein, P.L. Chapman, P. Midya, "Dynamic Maximum Power Point Tracking of Photovoltaic Arrays with Ripple Correlation Control," IEEE Transactions on Power Electronics, in press.
22. L. Qu and P.L. Chapman, "Extraction of low-order non-linear inductor models from a high-order physics-based representation," IEEE Transactions on Power Electronics, vol. 21, no. 3, pp. 813-817, May 2005.
23. S.J. Hong, P.L. Chapman, P.T. Krein, and K. Kim, "Selective-area growth and fabrication of recessed-gate GaN MESFET using plasma-assisted molecular beam epitaxy," Journal of Physica Status Solidi (a), vol. 203, no. 7, pp. 1872-1875, May 2006.
24. A. Davoudi, J. Jatskevich, and P.L. Chapman, "A simple method of introducing conduction losses for average modeling of switched-inductor cells," Electronics Letters, vol. 42, no. 21, pp. 1246-1247, October 2006.
25. J.R. Wells, X. Geng, P.L. Chapman, P.T. Krein, and B.M. Nee, "Modulation-based harmonic elimination," IEEE Transactions on Power Electronics, vol. 22, no. 1, pp. 336-339, January 2007.

26. A. Davoudi, J. Jatskevich, and P. L. Chapman, â€œAveraged modeling of switched-inductor cells considering conduction losses in discontinuous mode,â€ IET Electric Power Applications, vol. 1, pp. 402-406, May 2007.
27. A. Davoudi, P.L. Chapman, and J. Jatskevich, "State-space average-value modeling of capacitor-based switching stages: including conduction losses," Electronics Letters, vol. 43, no. 16, pp. 893-895, August 2008.
28. A. Davoudi, J. Jatskevich, P.L. Chapman, and A. Khaligh, "Averaged-switch modeling of fourth-order PWM dc-dc converters considering conduction losses in discontinuous mode," IEEE Transactions on Power Electronics, vol. 22, no. 6, pp. 2410-2415, Nov. 2007.
29. J.R. Wells, A. Khaligh, P.L. Chapman, and P.T. Krein, "Theoretical considerations for generalized selective harmonic control," IEEE Transactions on Power Electronics, in press.
30. N. Benavides and P.L. Chapman, "Mass-optimal design methodology for dc-dc converters in low-power, portable fuel cell applications," IEEE Transactions on Power Electronics, vol. 23, no. 3, pp. 1545-1555, May 2008.
31. A. Khaligh, P.L. Chapman, J.R. Wells, and P.T. Krein, "Dead-time distortion in generalized selective harmonic control," IEEE Transactions on Power Electronics, vol. 23, no. 3, pp. 1511-1517, May 2008.
32. H.-C. Seo, S.J. Hong, H.-I. Cho, J.-H. Lee, P.L. Chapman, and K. Kim, "Formation of low-resistance ohmic contact by damage-proof selective-area growth of single-crystal n+-GaN using plasma assisted molecular beam epitaxy (PAMBE)", Journal of Electronic Materials, Vol. 37, pp. 635-640, 2008.
33. N. Benavides and P.L. Chapman, "Modeling the effect of voltage ripple on the power output of photovoltaic modules," IEEE Transactions on Industrial Electronics, vol. 55, no. 7, pp. 2638-2643, July 2008.
34. A. Davoudi, Jatskevich, and P.L. Chapman, "Computer-aided dynamic characterization of fourth-order PWM dc-dc converters," IEEE Transactions on Circuits and Systems II: Express Briefs, vol. 55, no. 10, pp. 1021-1025, October, 2008.
35. H.-C. Seo, P.L. Chapman, H.-I. Cho, J.-H. Lee, and K. Kim, "Ti-based nonalloyed metal contacts for Al_0.15Ga_0.85N/GaN high electron mobility transistors using regrown n+-GaN by plasma assisted molecular beam epitaxy," Applied Physics Letters, 93 (102102), 2008.

Articles in Refereed Conferences

1. P.L. Chapman, S.D. Sudhoff, “Multiple Reference Frame Analysis of Non-sinusoidal Brushless DC Drives,” Proceedings of the SAE Aerospace Power Systems Conference, P-322, 1998, pp. 173-182.
2. P. L. Chapman, S. D. Sudhoff, C. A. Whitcomb, “Multiple Reference Frame Based Optimal Control of Surface-Mounted Brushless DC Drives,” Proceedings of the Naval Symposium on Electric Machines, pp. 115-124. 1998.
3. P. L. Chapman, S. D. Sudhoff, “Optimal Control of Permanent-Magnet AC Drives with a Novel Multiple Reference Frame Synchronous Estimator/Regulator,” Proceedings of the 34th IEEE Industry Applications Society Annual Meeting, pp. 2567-2573, 1999.
4. S. D. Sudhoff, P. L. Chapman, B. T. Kuhn, D. Aliprantis, “Experimental Characterization of an Advanced Induction Machine Model,” 3rd Naval Symposium on Electric Machinery, December 2000.

5. S. D. Sudhoff, P. L. Chapman, B. T. Kuhn, “An Advanced Induction Machine Model For High Frequency Drive Analysis,” 3rd Naval Symposium on Electric Machinery, December 2000.
6. P. L. Chapman, S. D. Sudhoff, “Formulation and Implementation of Optimized Current Waveforms for an 8/6 Switched Reluctance Machine,” 3rd Naval Symposium on Electric Machinery, December 2000.
7. P. L. Chapman, S. D. Sudhoff, “Optimized Waveform Control for an 8/6 Switched Reluctance Motor Drive,” 2001 IEEE Applied Power Electronics Conference, pp. 1096-1102, March 2001.
8. S. D. Sudhoff, B.T. Kuhn, P. L. Chapman, D. Aliprantis, “An Advanced Induction Machine Model For Predicting Machine Converter Interaction,” IEEE Power Electronics Specialists Conference, pp. 1096-1102, June 2001.
9. P. L. Chapman, P. T. Krein, “Micromotor Technology: Electric Drive Designer’s Perspective” presented at the 36th IEEE Industry Applications Society Annual Meeting, pp. 1978-1983, October 2001.
10. J. R. Wells, P. L. Chapman, P. T. Krein, T. Walls, "Linear Induction Machine Design for Instructional Lab Development," Electrical Manufacturing and Coil Winding Conference at the EIC/EMCW-2001 Expo, pp. 319-322, Octrober 2001.
11. P. L. Chapman, S. D. Sudhoff, "Dynamic Lossy Inductor Model for Power Converter Simulation," 2002 IEEE Applied Power Electronics Conference, pp. 137-143.
12. J. R. ells, P. L. Chapman, P. T. Krein, "Development of an Open-Frame Linear Machine for Instructional Laboratories," 2002 IEEE Power Electronics Specialists Conference, pp. 479-482.
13. S. Musunuri, P. L. Chapman, "Optimization Issues for Fully-Integrated CMOS DC-DC Converters," 2002 IEEE Industry Applications Society Annual Conference, pp. 2405-2410.
14. C. Park, P. L. Chapman, S. H. Rhee, S. J. Hong, X. Zhang, P. T. Krein, K. Kim, "GaN Switching Power Device Growth by Plasma Assisted Molecular Beam Epitaxy," 2002 IEEE Industry Applications Society Conference, pp. 576-579.
15. J. Owens, P.L. Chapman, "Reduced Finite Element Analysis for Magnetic Devices," Proceedings of the 2002 Electrical Manufacturers and Coil Winders Annual Conference.
16. P. L. Chapman and P. T. Krein, "Motor Re-Rating for Traction Applications: Field Weakening Revisited," 2003 IEEE International Electric Machines and Drives Conference, pp. 1388-1391.
17. J. R. Wells, P. L. Chapman, and P. T. Krein, "Applications of Ripple Correlation Control of Electric Machinery," 2003 IEEE International Electric Machines and Drives Conference, pp. 1498-1503.
18. J. D. Owens and P. L. Chapman, "Reduced FEA-Based State-Space Model of Stationary Magnetic Devices," 2003 IEEE Power Electronics Specialists Conference, pp. 265-271.
19. J. R. Wells, P. L. Chapman, and P. T. Krein, "Fundamental Aspects of Ripple Correlation Control of Electric Machinery," 2003 IEEE Power Electronics Specialists' Conference, 1659-1663.
20. S. Musunuri, P. L. Chapman, J. Zou, and C. Liu, "Inductor Design for Monolithic DC/DC Converters," 2003 IEEE Power Electronics Specialists' Conference, pp. 227-232.
21. A. P. Wu and P. L. Chapman, "Cancellation of Torque Ripple due to Nonidealities of Permanent Magnet Synchronous Machine Drives," 2003 Power Electronics Specialists Conference, pp. 256-261.
22. S. Musunuri and P. L. Chapman, "Monolithic DC-DC Converter with Multi-layer Spiral Inductor," Proceedings of 2003 IEEE Industry Applications Society Annual Conference, pp. 1270-1275.

23. J. R. Wells, B. Nee, M. Amrhein, P. T. Krein, and P. L. Chapman, "Low-Cost Single-Phase Powered Induction Motor Drive for Residential Applications," Proceedings of 2004 Applied Power Electronics Conference, pp. 1579-1583.
24. T. L. Flowers and P. L. Chapman, "Issues with low input voltage boost converter design," IEEE Power Electronics Specialists Conference, 2004, pp. 2152 - 2156.
25. P. Niu, P. L. Chapman, R. Riemer, and X. Zhang, "Evaluation of motions and actuation methods for biomechanical energy harvesting," IEEE Power Electronics Specialists Conference, 2004, pp. 2100 - 2106.
26. J. R. Wells, B. Nee, P. L. Chapman, and P. T. Krein, "Optimal harmonic elimination control," IEEE Power Electronics Specialists Conference, 2004, pp. 4214 - 4219.
27. S. Musunuri, P. L. Chapman, J. Zou, and C. Liu, "Design and Fabrication of PDMA Inductors for Fully Integrated Power Converters," IEEE Power Electronics Specialists Conference, 2004, pp. 4460 - 4466.
28. J. W. Kimball and P. L. Chapman, "Lowering conduction losses with a parallel MOSFET-IGBT combination," 2004 IEEE Industry Applications Society Annual Meeting, 2004, pp. 1233-1237.
29. L. Qu, P.L. Chapman, "A Trajectory Piecewise-Linear Approach to Model Order Reduction for Nonlinear Stationary Magnetic Devices," 2004 IEEE Workshop on Computers in Power Electronics, pp. 15-19.
30. N. Benavides, P.L. Chapman, "Object-oriented modeling of a multiple-input multiple-output flyback converter in Dymola," 2004 IEEE Workshop on Computers in Power Electronics, pp. 156-160.
31. P.L. Chapman, "Multi-resolution switched system modeling," 2004 IEEE Workshop on Computers in Power Electronics, pp. 167-172.
32. J. Byoun, P.L. Chapman, "Central power management unit as portable power management architecture based on true digital control," 2004 IEEE Workshop on Computers in Power Electronics, pp. 69-73.
33. R.S. Balog, Z. Sorchini, J.W. Kimball, P.L. Chapman, P.T. Krein, and P.W. Sauer "Blue-box approach to power electronics and machines laboratories," IEEE Power Engineering Society General Meeting, June 2005, pp. 962-970.
34. P.L. Chapman, "Efficiency issues in variable-capacitance micromotors," 2005 IEEE International Electric Machines and Drives Conference, May 2005, pp. 1122-1129. (Invited)
35. J.R. Wells, P.L. Chapman, P.T. Krein, "Generalization of Selective Harmonic Control/Elimination," 2005 IEEE Power Electronics Specialists Conference, June 2005, pp. 1358-1363.
36. N. Benavides, T. Esram, P.L. Chapman, "Ripple correlation control of a multiple-input buck-boost converter," 2005 IEEE Power Electronics Specialists Conference, June 2005, pp. 160-164.
37. S. Musunuri, P.L. Chapman, "Optimization of high-width CMOS transistors for low-power dc-dc converter applications," 2005 IEEE Power Electronics Specialists Conference, June 2005, pp. 2151-2157.
38. S. Musunuri, P.L. Chapman, "Design of low power monolithic dc-dc buck converter with integrated inductor," 2005 IEEE Power Electronics Specialists Conference, June 2005, pp. 1773-1779.
39. S. J. Hong, P.L. Chapman, P.T. Krein, and K. Kim “Selective-area growth and fabrication of recessed-gate MESFET using plasma-assisted molecular beam epitaxy.” 6th International Conference on Nitride Semiconductors, Bremen, Germany, August 28, 2005.

40. L. Qu and P.L. Chapman, "Extraction of dynamic low-order non-linear inductor models based on steady state solutions," 2006 IEEE Power Electronics Specialists Conference, 2006.
41. P. Niu and P.L. Chapman, "Design and performance of linear biomechanical energy conversion devices," 2006 IEEE Power Electronics Specialists Conference, 2006.
42. J.R. Wells, P.L. Chapman, and P.T. Krein, "Theoretical considerations for selective harmonic control," 2006 IEEE Power Electronics Specialists Conference, 2006.
43. P.L. Chapman, "Some perspectives regarding integrated electric drives," 3rd AUS Symposium on Mechatronics, American University of Sharjah, United Arab Emirates, April 18-20, 2006. (Invited)
44. L. Qu and P.L. Chapman, "Toward a system for automatic extraction of low-order models for magnetic devices," in 2006 IEEE Computers in Power Electronics Workshop, pp. 193-198.
45. A. Davoudi, J. Jatskevich, and P.L. Chapman, "Considering source dynamics in computer-aided parametric average-value modeling of PWM converters," in IEEE Computers in Power Electronics Workshop, pp. 270-274.
46. A. Kwasinki, W.W. Weaver, P.L. Chapman, P.T. Krein, "Telecommunications Power Plant Damage Assessment Caused by Hurricane Katrina – Site Survey and Follow-Up Results," in 2006 IEEE International Telecommunications Energy Conference, in press.
47. A. Davoudi, J. Jatskevich, and P.L. Chapman, "Computer-aided average-value modeling of fourth-order pwm dc-dc converters," in 2007 International Symposium on Circuits and Systems, pp. 793-796.
48. A. Davoudi, L. Qu, and P.L. Chapman, "Summary of recent work on reduction techniques applied to electromechanical modeling," 2007 IEEE Electric Ship Technologies Symposium, pp. 363-370.
49. A. Davoudi, J. Jatskevich, and P.L. Chapman, "Parametric average-value modeling of multiple-input buck converters," in Proceedings of the 2007 Canadian Conference on Electrical and Computer Engineering, pp. 990-993.
50. N.D. Benavides and P.L. Chapman, "Boost converter with a reconfigurable inductor for photovoltaic power processing," in 2007 IEEE Power Electronics Specialists Conference, pp. 1695-1700.
51. A. Davoudi and P.L. Chapman, "Eddy current modeling with order reduction in dynamic magnetic equivalent circuits," in 2007 IEEE Power Electronics Specialists Conference, pp. 2069-2074.
52. L. Qu and P.L. Chapman, "Extraction of dynamic, low-order models for magnetic devices based on finite element analysis with hysteresis," in 2007 IEEE Power Electronics Specialists Conference, pp. 2082-2088.
53. A. Davoudi, J. Jatskevich, P.L. Chapman, "Computer-aided average value modeling of peak current-mode controlled dc-dc converters considering parasitics," in 2007 IEEE Power Electronics Specialists Conference, pp. 2135-2139.
54. A. Khaligh, P.L. Chapman, A. Davoudi, and J. Jatskevich, "Realization of parasitics in the stability of dc-dc converters loaded by constant-power loads in discontinuous conduction mode," 2007 IEEE Vehicle Power and Propulsion Conference, pp. 31-35.
55. A. Khaligh, A.P. Friedl, P.L. Chapman, and A. Emadi, "Anticipatory control of Voltage Regulator Modules," 2007 IEEE Industrial Electronics Society Annual Conference, pp. 1542-1547.
56. J.S. Popovics, G. Gallo, M.D. Shelton, and P.L. Chapman, "A magnetic sensing approach to characterize corrosion in reinforced concrete," in Proceedings of the SPIE - The International

Society for Optical Engineering, v 6529 part 1, Sensors and Smart Structures Technologies for Civil, Mechanical, and Aerospace Systems 2007, 2007, pp. 65291A-1-65291A-7.

57. H.-C. Seo, P.L. Chapman, P.T. Krein, K. Kim, "Non-Alloyed Ohmic Contact Using Selective-Area Growth by Plasma-Assisted Molecular Beam Epitaxy", the 49th Electronic Materials Conference, June, 2007, Notre Dame, USA
58. A. Davoudi and P.L. Chapman, "A general framework for automated physics-based reduced-order modeling of electromechanical systems," 2007 Summer Computer Simulation Conference, pp. 221-228.
59. H.-C. Seo, P.L. Chapman, P.T. Krein, J.-H. Lee, and K. Kim, "DC Performance of High-Power GaN FET Devices with Non-Alloyed Ohmic Contacts Fabricated by PAMBE-Based Selective-Area Growth", the 7th International Conference of Nitride Semiconductors (ICNS-7), Sept. 2007, Las Vegas, USA
60. A. Davoudi, A. Khaligh, and P.L. Chapman, "Low-Order Dynamic Magnetic Equivalent Circuits of Saturated Steel Laminations," 2007 IEEE Vehicle Power and Propulsion Conference, pp. 725-729.
61. B. Nee and P.L. Chapman, "Integrated filter elements in electric drives," 2007 IEEE Vehicular Power and Propulsion Conference, pp. 148-153.
62. G. Gallo, J. Popovic, M.S. Johnson, and P.L. Chapman, "Passive and active corrosion sensing for metals using magnetic sensors," in Proceedings of SPIE - The International Society for Optical Engineering, v 6935, Health Monitoring of Structural and Biological Systems, 2008, pp. 69350U-1-69350U-6.
63. A. Khaligh and P.L. Chapman, "Reduction of Output Capacitance in Dc-Dc Converters using Anticipated Load Transients," IEEE 2008 Applied Power Electronics Conference, pp. 818-823.
64. P. Niu, P.L. Chapman, L. DiBerardino, and E.T. Hsiao-Weckler, "Design and optimization of a biomechanical energy harvesting device," in 2008 IEEE Power Electronics Specialists Conference, pp. 4062-4069.
65. A. Davoudi, P.L. Chapman, and J. Jatskevich, "Nonlinear order reduction in dynamic magnetic equivalent circuits of electromechanic actuators : incorporating relative motion and back EMF," in 20087 IEEE Power Electronics Specialists Conference, pp. 3992-3995.
66. Y. Chen, A. Davoudi, and P.L. Chapman, "Multifrequency modeling of a multiple-input dc-dc converter," in 2008 IEEE Power Electronics Specialists Conference, pp. 4604-4610.
67. L. Qu and P.L. Chapman, "Extraction of dynamic low-order models for multiwinding magnetic devices based on finite element analysis," in 2008 IEEE Power Electronics Specialists Conference, pp. 4611-4616.
68. A. Davoudi, P.L. Chapman, and J. Jatskevich, "Multi-resolution simulation of PWM dc-dc converters," Accepted in IEEE International Telecommunications Energy Conference (INTELEC '08), February 2008.
69. S. Chiniforoosh, P. Alaeinovin, A. Davoudi, J. Jatskevich, and P.L. Chapman, “Numerical average-value modeling of a micro wind turbine generator system,” IEEE International Telecommunications Energy Conference (INTELEC’08), February 2008.
70. A. Davoudi, A. Bazzi, and P.L. Chapman, "Application of Synergetic Control Theory to Non-Sinusoidal PMSMs via Multiple Reference Frame Theory," in 2008 IEEE Industrial Application Society Annual Conference, in press.
71. P. Alaeinovin, S. Chiniforoosh, A. Davoudi, J. Jatskevich, and P.L. Chapman, "Average-Value Modeling of Automotive Alternator-Rectifier Systems," in 2008 IEEE Industrial Application Society Annual Conference, in press.

72. P.T. Krein, R. Balog, T. Esram, B. Kuhn, and P.L. Chapman, "The meaning of grid parity in power electronics," Energy 2030 Conference, Atlanta, GA, 2008.

Patents

1. P.L. Chapman, B.G. Dobbs, "Multiple-Input Buck-Boost Converter," US Patent 7,227,277.
2. P.L. Chapman, T.L. Flowers, J.W. Kimball, P.T. Krein, "Startup technique for arbitrarily low input voltage power converters," US Patent 7,078,083.

Book Chapter

1. P.L. Chapman, “Permanent-Magnet Synchronous Machine Drives,” The Handbook of Power Electronics, ed. T. Skvarenina, CRC Press LLC, 2001.

Invited Lectures

1. "Hybrid and other Clean-Fuel Vehicles," presented at IEEE Central Illinois Section Meeting, March 13, 2003.
2. "Biomechanical Energy Conversion," presented to Illinois Institute of Technology, September 5, 2003.
3. "Design and Construction of Monolithic Power Management ICs," presented to Laboratory for Electromagnetic and Electronic Systems at Massachusetts Institute of Technology, November 7, 2003.
4. "Research on Hybrid Energy Systems", presented to University of Missouri-Rolla, Nov. 3, 2004.
5. "Power Electronics and Connectivity for New and Alternative Energy Sources for the Military," to be presented at Institute of Defense and Governments Affairs New and Alternative Energy Sources Conference: Next Generation Power for the Military, Washington DC, June 27, 2005.
6. "Power systems and communications damage due to Hurricane Katrina," National Science Board Workshop, Toward a National Agenda for Hurricane Science and Engineering, Workshop #2: The Research Community, Boulder, Colorado, February 8, 2006.
7. "Some perspectives regarding electric drives," 3rd AUS International Symposium on Mechatronics, American University of Sharjah, United Arab Emerites, April 18-20, 2006.
8. "Renewable energy activities at UIUC: A Power Electronics Perspective," Fueling Change in Renewable Energy, Urbana, IL, April 2007.
9. "Experiences of a professor with the SBIR program and an alternative-energy startup," Enhancing Linkages between Universities and Small Businesses in EPSCoR Jurisdictions, Portland, Maine, Oct. 15, 2007
10. "Solar Power in Illinois," IEEE Central Illinois Section, Rockford, Illinois, 2007.
11. "Power Management for Energy Harvesting," National Academy of Engineering, Irvine, CA, German-American Frontiers of Engineering Conference, April 26, 2008.
12. "Energy Harvesting and the Role of Power Electronics," Texas Instruments, Dallas, TX, July 29, 2008.
13. "Sustainable Production of Electric Energy," Environmental Horizons Sustainability Summit, Urbana, IL April 24, 2008.
14. "GaN-based power converters with integrated passive components," First International Workshop for Power Supply on Chip, Cork, Ireland, Sept. 22, 2008.
15. "Solar Power in Illinois," Champaign Public Library, Champaign, IL, Nov. 6, 2008.
16. "Integrated Passives," Advisory on Electron Devices, Study Topic Area Research, Arlington, VA, January 8, 2008.