



Dr. Angelo L. Gattozzi

Function: Research Associate

Biography

Dr. Gattozzi joined The University of Texas Center for Electromechanics (UT-CEM) in 2000. His main focus is on electric power system modeling and simulation, smart-grid/micro-grid systems with renewable energy resources, the electric system of the DDG51 class Navy destroyer and of some Army Tactical Operating Centers, energy harvesting, resonant converters, high speed motors/generators, magnetically active composites for flywheel energy storage, and power modules for the electric gun program,

Prior to joining UT-CEM, Dr. Gattozzi was lead R&D electrical engineer at the Lincoln Electric Company in Cleveland, Ohio, where he was responsible for the development of a complete line of induction motors, 1-500 HP, which achieved the highest efficiency levels in the industry. He was previously an adjunct associate professor of Electrical Engineering at Case Western Reserve University in Cleveland, Ohio, in Electromagnetic Theory, Electromechanical Energy Conversion, and Microwave Theory and Techniques. There he developed an early prototype of a digital storage oscilloscope with 100 MHz bandwidth (1972), an Ashby-Jephcott interferometer for plasma gun diagnostics (1974), and a theory of superconducting flux pumps (1978).

Dr. Gattozzi was co-founder of Tyler Research and Engineering, a consulting firm and laboratory, where he led many R&D projects sponsored by industry and Government Agencies, among which: the first computer program on record for calculating the performance of superconducting machines, a four axes positioner for sheet steel processing, electromagnetic stirring for continuous steel casting, an improved atmospheric moisture sensor, ultrasonic sensors, experimental characterization of electronic assemblies for automotive, aircraft, and marine applications, a low-pass active filter with 0-25.5 kHz band and 70 dB attenuation at 27.5 kHz for satellite communication, and many others.

He began his career as an electrical engineer at Reliance Electric Co.'s Research and Development Center in Cleveland, Ohio, where he was co-developer of the first permanent magnet motor in the U.S.A. based on rare earth magnet technology, and of several computer programs for calculating machine performance still in use today.

Current Projects

* Office of Naval Research: all electric ship power architecture, advanced power system for DDG class destroyers, pulsed load integration, hybrid energy storage modules.

Research Areas/Areas of Interest

- * Smart-grid/Micro-grid systems with renewable energy resources
- * High power soft-switching converters
- * High speed, high power electric machines
- * Applications of superconductivity to power systems

About Me

- * IEEE Senior Life Member
- * Program Evaluator of the Accreditation Board for Engineering and Technology (ABET)

Education

- * Ph.D., Electrical Engineering and Applied Physics, Case Western Reserve University, Cleveland, Ohio, 1978
- * M.S., Electrical Engineering, Case Western Reserve University, Cleveland, Ohio, 1975
- * B.S., Electrical Engineering, Case Western Reserve University, Cleveland, Ohio, 1971
- * Accounting Certificate, John Carroll University School of Business, Cleveland, Ohio, 1976
Certified Public Accountant, State of Ohio, certificate no. 19,579, 1980

Awards

- Superconducting Power Switch, U.S. Patent No. 5,105,098, April 14, 1992

Publications

- *A.L. Gattozzi, J.D. Herbst, R.E. Hebner, J.A. Blau, K.R. Cohn, W.B. Colson, J.E. Sylvester, M.A. Woehrman: "Power System and Energy Storage Models for Laser Integration on Naval Platforms", Electric Ship Technologies Symposium, Alexandria, VA, June 21-24, 2015.
- *F.D. Engelkemeir, A.L. Gattozzi, J.D. Herbst, R.E. Hebner, G.A. Hallock: "Experimental Investigation of the Performance of Two New Types of Soft-Switching Power Converters for Electric Ships", Electric Ship Technologies Symposium, Alexandria, VA, June 21-24, 2015.
- *S. Pish, J. Herbst, D. Wardell, A. Gattozzi, M. Flynn: "Power Management and Energy Storage Experiments on a MW-Scale Naval Power System Test-bed", Electric Ship Technologies Symposium, Alexandria, VA, June 21-24, 2015.
- *R.E. Hebner, A.L. Gattozzi, S.D. Pekarek: "Performance Assurance for DC Cables for Electric Ships", Electric Ship Technologies Symposium, Alexandria, VA, June 21-24, 2015.
- *M. Steurer, M. Bosworth, D. Soto, S.D. Sudhoff, S.D. Pekarek, R. Swanson, J. Herbst, S. Pish, A. Gattozzi, D. Wardell, M. Flynn, T. Fikse: "Analysis of Experimental Rapid Power Transfer and Fault Performance in DC Naval Power Systems", Electric Ship Technologies Symposium, Alexandria, VA, June 21-24, 2015.
- *R.E. Hebner, F.M. Uriarte, A. Kwasinski, A.L. Gattozzi, H. Estes, A. Anwar, P. Cairoli, R.A. Dougal, X. Feng, et al.: "Technical Cross-fertilization between Terrestrial Microgrids and Ship Power Systems", J. Mod. Power Syst. Clean Energy, DOI 10.1007/s40565-015-0108-0, Springerlink.com, May 27, 2015, <http://link.springer.com/article/10.1007/s40565-015-0108-0>
- *J.D. Herbst, H. Ouroua, A.L. Gattozzi, S. Pratap, "Rotating Machine Technologies for Integration of Pulsed and High Power Loads in Naval Electric Power Systems", Electric Ship Technology Symposium, Arlington, VA, USA, Apr. 22-24, 2013.
- *J.D. Herbst, F.D. Engelkemeir, A.L. Gattozzi, "High Power Density and High Efficiency Converter Topologies for Electric Ships", Electric Ship Technology Symposium, Arlington, VA, USA, Apr. 22-24, 2013.
- *J.D. Herbst, S.P. Pish, J.R. Jackson, B. Gully, and A.L. Gattozzi, "Electric Power System Concepts for Integration of Advanced Sensor and Pulsed Loads in the DDG-51 Class Ships", ASNE Day 2013, Arlington, VA, USA, Feb. 21-22.
- *R.E. Hebner, J.D. Herbst, A.L. Gattozzi, F.M. Uriarte, "Modeling and Simulation Roadmap to Enhance Electrical Energy Security of U.S. Naval Bases", ASNE Day 2013, Arlington, VA, USA, Feb. 21-22.
- * F.M. Uriarte, A.L. Gattozzi, J.D. Herbst, H.B. Estes, T.J. Hotz, A. Kwasinski, R.E. Hebner "A dc arc model for series faults in low voltage microgrids," IEEE Transactions on Smart Grid, vol. 3, no. 4, December 2012, pp. 2063-2070.

- *F.M. Uriarte, R.E. Hebner, A. Kwasinski, A.L. Gattozzi, H.B. Estes, A. Anwar, P. Cairolì, R.A. Dougal, X. Feng, H-M. Chou, L. Thomas, M. Pipattanasomporn, S. Rahman, F. Katiraei, M. Steurer, M.O. Faruque, M.A. Rios, G.A. Ramos M.J. Mousavi, "Technical cross-fertilization between terrestrial microgrids and ship power systems," presented at the ESRDC 10th Anniversary Meeting, Austin, TX, USA, June 4-6, 2012.
- *R.E. Hebner, A. Ouroua, A.L. Gattozzi, C.S. Edrington, M. Andrus, A. Hasanzadeh, J. Langston, Y. Luo, S. Srivastava, M. Steurer, "Load integration, including radar and advanced weapons," presented at the ESRDC 10th Anniversary Meeting, Austin, TX, USA, June 4-6, 2012.
- *J.D. Herbst, A.L. Gattozzi, F.M. Uriarte, et al., "The role of component and subsystem testing in early stage design," presented at the ESRDC 10th Anniversary Meeting, Austin, TX, USA, June 4-6, 2012.
- *J.D. Herbst, A.L. Gattozzi, "Flywheel energy storage to improve the energy efficiency of the DDG-51 ship service electric power distribution system," Electric Machines Technology Symposium (EMTS) 2012, Philadelphia, PA, May 23-24, 2012.
- * A.L. Gattozzi, J.D. Herbst, F.M. Uriarte, R.E. Hebner, "Analytical description of a series fault on a dc bus," 2012 IEEE Innovative Smart Grid Technologies Conf., Washington, DC, January 17-19, 2012.
- * F.M. Uriarte, H.B. Estes, T.J. Hotz, A.L. Gattozzi, J.D. Herbst, A. Kwasinski, R.E. Hebner "Development of a series fault model for dc microgrids," 2012 IEEE Innovative Smart Grid Technologies Conf., Washington, DC, January 17-19, 2012.
- * H.B. Estes, A. Kwasinski, R.E. Hebner, F.M. Uriarte, A.L. Gattozzi, "Open series fault comparison in ac & dc micro-grid architectures," 2011 IEEE 33rd Intl. Telecommunications Energy Conf. (INTELEC), Amsterdam, The Netherlands, Oct. 9-13, 2011, pp. 1-6.
- * J.D. Herbst, A.L. Gattozzi, "MVDC and HFAC electric power system architectures for the transformable sea base connector (t-craft)," 11th International Conf. on Fast Sea Transportation FAST 2011, Honolulu, HI, Sept. 2011.
- * F.M. Uriarte, R.E. Hebner, A.L. Gattozzi, "Accelerating the simulation of shipboard power systems," Proc. Grand Challenges in Modeling & Simulation (GCMS2011), Part of the 2011 Summer Simulation Multiconference 2011 (Summer Sim2011), The Hague, Netherlands, June 27-30, 2011.
- * J.D. Herbst, A.L. Gattozzi, A. Ouroua, F.M. Uriarte, "Flexible test bed for MVDC and HFAC electric ship power system architectures for navy ships," Proc. IEEE Electric Ship Technologies Symp., pp. 66-71, Alexandria, VA, USA, April 10-13, 2011.
- * R. Hebner, J. Herbst, A. Gattozzi, "Pulsed power loads support and efficiency improvement on navy ships," Naval Engineers Journal, vol. 122, no. 4, pp. 261, Dec. 2010.
- * R. Hebner, J. Herbst, and A. Gattozzi, "Large scale simulations of a ship power system with energy storage and multiple directed energy loads," Proc. Grand Challenges in Modeling & Simulation (GCMS2010), Part of the International Simulation Multiconference (ISM'10), Ottawa, Canada, July 11-14, 2010, pp. 430-435.
- * R.E. Hebner, A.L. Gattozzi, K.R. Cohn, and W.B. Colson, "Analysis of the power quality impact of multiple directed energy loads on an electric ship power system," 23rd Annual Solid State and Diode Laser Technology Review, Broomfield, Colorado, June 15-18, 2010.
- * R. Hebner, J. Herbst, and A. Gattozzi, "Pulsed power loads support and efficiency improvement on navy ships," Electric Machines Technology Symposium 2010 (EMTS2010), Philadelphia, Pennsylvania, May 19-20, 2010.
- * R. Hebner, J. Herbst, and A. Gattozzi, "Intelligent microgrid demonstrator," Electric Machines Technology Symposium 2010 (EMTS2010), Philadelphia, Pennsylvania, May 19-20, 2010.
- * J.D. Herbst, J.J. Hahne, H.E. Jordan, H-P Liu, A.L. Gattozzi, B. Wu, "Challenges in the design of a 100 kW induction motor for a PHEV application," 5th IEEE Vehicle Power and Propulsion Conference (VPPC'09), Dearborn, MI, U.S.A., September 7-11, 2009.
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- * J.D. Herbst, R.F. Thelen, A.L. Gattozzi, A.S. Williams: Experimental Results and Design Guidelines Derived from the Testing of a 2 MW, 250 Hz, Auxiliary Resonant Commutated Pole Bi-Directional Converter, 23rd Annual IEEE 2008 Applied Power Electronics Conference and Exposition (APEC 2008), Austin, Texas, USA, February 24-28, 2008, pp. 1240-1246.
- * A.L. Gattozzi, R.F. Thelen, and A.S. Williams, "Soft switching drive for a megawatt class, variable speed, motor/generator, Workshop on Transportable Megawatt Power Systems, The University of Texas, Austin, Texas, U.S.A., March 6-7, 2007.
- * A.S. Williams and A.L. Gattozzi, "Applications of an Auxiliary Resonant Commutated Pole Converter," 2007 Applied

Power Electronics Conference, Anaheim, California, U.S.A., February 25-March 1, 2007.

* R.F. Thelen, A.L. Gattozzi, D. Wardell, and A.S. Williams, "A 2 MW Motor and ARCP Drive for High Speed Flywheel," 2007 Applied Power Electronics Conference, Anaheim, California, U.S.A., February 25-March 1, 2007.

* J.D. Herbst, M.T. Caprio, A.L. Gattozzi, and C. Graf, "Challenges and solutions for the use of flywheel energy storage in high power applications," Electrical Energy Storage Applications and Technologies Conference (EESAT 2005), San Francisco, California, U.S.A., October 16-19, 2005.

* M. Elmore, et al., "Optimum design of snubber circuits for thyristor assemblies using an improved PSPICE thyristor model and computational intelligence," Digest of Technical Papers, 14th IEEE International Pulsed Power Conference (PPC-2003), June 15-18, 2003, vol. 1, pp. 139-142.

* A.L. Gattozzi and J.A. Pappas, "Circuits for protecting and triggering SCRs in high-power converters," IEEE Transactions on Magnetics, vol. 39, no. 1, January 2003, pp. 414-417.

* A.L. Gattozzi, S.P. Pish, and J.A. Pappas, "Effect of converter packaging techniques on device electrical conduction," IEEE Transactions on Magnetics, vol. 39, no. 1, January 2003, pp. 418-421.

* J.A. Pappas, A.L. Gattozzi, and R.E. Hebner, "Pulsed-duty characterization of turn-off for a population of SCRs and the practical effect of variations on equalization circuit design," IEEE Transactions on Magnetics, vol. 39, no. 1, January 2003, pp. 432-436.

* A.L. Gattozzi and R.E. Hebner, "Inconsistencies in electric motor certification requirements," 6th IASTED International Multi-Conference on Power and Energy Systems (PES 2002), Marina Del Rey, California, U.S.A., May 13-15, 2002.

* A.L. Gattozzi, "Impact of electrical steel coating properties on motor design and performance," Proceedings of 15th Annual Conference on Properties and Applications of Magnetic Materials, Illinois Institute of Technology, May 1996, invited paper.

* A.L. Gattozzi: "A 200 kW load bank for testing torpedoes," Final report on work commissioned by Gould Ocean Systems, Cleveland, Ohio, Aug. 30, 1991.

* A.L. Gattozzi: "Resistance calculation and percent current deviation for EF drum designs," Final report on work commissioned by Gould Electronic Systems, Cleveland, Ohio, Oct. 19, 1990.

* A.L. Gattozzi, L. Xin, M.S. Gattozzi: "Experimental investigation of functionality and durability of some automotive PC board assemblies," Final report on work commissioned by Ford Motor Co., Dearborn, Mi., March 2, 1990.

* A.L. Gattozzi: "5 kVA resonant inverter from unregulated DC supply for MBTA (Massachusetts Bay Transportation Authority)," Final report on work commissioned by ABB Corp., Boston, Ma., Dec. 4, 1989.

* A.L. Gattozzi, "Thin film superconducting power switch," Proceedings 24th Intersociety Energy Conversion Engineering Conference, Washington, D.C., U.S.A., August 6-11, 1989, pp. 465-470.

* A.L. Gattozzi, "Opportunities for wire manufacturers in the field of superconductivity," Wire Journal International, October 1988, pp. 45-48, invited paper.

* A. Melfi, A.L. Gattozzi, and F. Kogovsek, "Automatic normal force measurement system for connector pins," 21st Connectors and Interconnection Technology Symposium, Dallas, Texas, U.S.A., October 1988, pp. 43-48.

* A.L. Gattozzi, and F. Kogovsek, "Connectors and interconnections in the superconducting environment," 21st Connectors and Interconnection Technology Symposium, Dallas, Texas, U.S.A., October 1988, pp. 377-382.

* A.L. Gattozzi, "PLC programming languages," Power Transmission Design, September 1988, pp. 25-33.

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* A.L. Gattozzi, A. Melfi, and M.S. Gattozzi, "Experimental investigation on the reliability of commercial connectors," 20th Connectors and Interconnection Technology Symposium, Philadelphia, Pennsylvania, U.S.A., October 1987, pp. 36-41.

* A.L. Gattozzi: "Operational testing of aircraft electrical cable assemblies," Final report on work commissioned by Aero Controlex Group, Cleveland, Ohio, Oct. 15, 1987.

* A.L. Gattozzi, "Computer program to calculate the performance of superconducting machines", Final report on work commissioned by Reliance Electric Co., Cleveland, Ohio, Oct. 8, 1987.

* A.L. Gattozzi, A. Melfi: "Feasibility study of a low-pass active filter with 0-25.5 kHz band and 70 dB attenuation at 27.5 kHz," Final report on work commissioned by Telespazio S.p.A., Rome, Italy, Sept. 11, 1987.

* A.L. Gattozzi, A. Melfi, and M.S. Gattozzi, "Test method for the measurement of connector pin forces," 19th Connectors and Interconnection Technology Symposium, Anaheim, California, U.S.A., October 1986, pp. 80-84.

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- * A.L. Gattozzi, M. Melfi: "Four axes positioner for steel sheet processing," Final report on work commissioned by Weirton Steel Co., Weirton, WV., Oct. 25, 1985.
- * A.L. Gattozzi: "An improved atmospheric moisture sensor," Final report on Dept. of Energy SBIR contract 2627-841, Washington, DC, May 15, 1985.
- * O.K. Mawardi, A.L. Gattozzi, and A. Ferendeci, "High voltage superconducting switch for power applications," IEEE Transactions on Magnetics, vol. 19, no. 3, May 1983, pp. 1067-1070.
- * A.L. Gattozzi: "A 500 A, constant current, 3.6 kW, load bank for fuel cell testing," Final report on work commissioned by Westinghouse Electric Co., Pittsburgh, Pa., March 8, 1983.
- * A.L. Gattozzi, H. Dessner: "Concept study for electromagnetic stirring in continuous casting," Final report on work commissioned by U.S. Steel Corp., Contract 545-11786-74, Pittsburgh, Pa., Sept. 24, 1981.
- * H.E. Jordan and A.L. Gattozzi, "Efficiency testing of induction machines," IEEE/IAS Conference, Cleveland, Ohio, October 1979, pp. 284-289.
- * O.K. Mawardi, A.L. Gattozzi, and H. Chung, "Operational characteristics of a flux pump," IEEE Transactions on Magnetics, vol. 15, no. 1, January 1979, pp. 828-831.