

Sami Barmada

Curriculum Vitae (updated November 2021)

Bio

Sami Barmada was born [REDACTED].

In 1989 he joined the Electrical Engineering program at the University of Pisa where he graduated in June 1995.

In November 1995 he joined ABB Teknologi AS in Billingstادت, Norway, where he worked in the Power Systems and Components Department until June 1997.

In 1997 he joined the Ph.D. course in Applied Electromagnetics at the University of Pisa, and in year 2000 he discussed the thesis entitled "Wavelet Expansion Methods for the Numerical Analysis of Multiconductor Transmission Lines".

During the Ph.D. he was a visiting student at the University of Akron, OH, USA, under the supervision of Professor Nathan Ida, at the Electrical and Computer Engineering Department.

He was Assistant Professor and Associate Professor from 2004 to 2016 at the University of Pisa (DESTEC department), where he is now Full Professor since year 2016.

International coordination activities

President, Applied Computational Electromagnetic Society (ACES), 2015 – 2017.

Vice President, ACES Society, 2013 – 2015

ACES Officer, 2007 – present.

International Steering Committee Member CEFC, 2016 – present

Co-Editor in chief of the ACES Journal, 2018 – present

Associate Editor of the ACES Journal, 2008 – 2017

Awards

ACES Fellow (2014)

IEEE Senior Member (2010)

The John F Alcock Memorial Prize: (2004): awarded annually to a paper published by the Institution of Mechanical Engineers which concentrates on technical innovation in the railway traction field (S. Barmada, A. Landi, M. Papi, L. Sani, "Wavelet Multiresolution Analysis for Monitoring the Occurrence of Arcing on Overhead Electrified Railways").

The Exemplary Service Award: ACES Society (2008) for "Outstanding Service as 2007 ACES Symposium Chair".

The ACES Meritorious Service Award: ACES Society (2015) "For exemplary and dedicated service to the society including the annual conference and the ACES Journal".

International Conferences (General Chairman):

ACES 2007 (Verona, Italy)

ACES 2017 (Firenze, Italy)

IEEE CEFC 2020 (Pisa, Italy, turned into virtual)

International Conferences (Technical Program Chairman)

PIERS 2004 (Pisa, Italy)
ACES 2013 (Monterey, USA)
ACES 2014 (Jacksonville, USA)
IEEE ICWITS – ACES 2016 (Honolulu, USA)
ACES 2020 (Monterey, USA, turned into virtual)
ACES 2021 (Virtual)
IEEE CEFC 2022 (Denver, Colorado, USA)

International Conferences (Editorial Board/Track chair)

RAILWAYS 2014 (Ajaccio, France)
RAILWAYS 2016 (Cagliari, Italy)
IEEE CEFC 2016 (Miami, USA)
RAILWAYS 2018 (Barcelona, Spain)
RAILWAYS 2020 (Canary Island, Spain)

Publications on International Journals

- M. Tucci, S. Barmada, A. Formisano, D. Thomopoulos, **“A regularized procedure to generate a deep learning model for topology optimization of electromagnetic devices”**, *Electronics*, Vol. 18, no. 18, 2021, pp. 2185
- S. Barmada, N. Fontana, A. Formisano, D. Thomopoulos, **“A Deep Learning Surrogate Model for Topology Optimization”**, *IEEE Transaction on Magnetics*, Vol. 57, no. 6, June 2021.
- A. Betti, M. Tucci, E. Crisostomi, A. Piazzini, S. Barmada, D. Thomopoulos, **“Fault Prediction and Early-Detection in Large PV Power Plants Based on Self-Organizing Maps”**, *Sensors*, Vol 21, n. 5, 2021, pp. 1 – 16.
- D. Brizi, N. Fontana, S. Barmada, A. Monorchio, **“An accurate Equivalent Circuit Model of Metasurface-Based Wireless Power Transfer System”**, *IEEE Open Journal on Antennas and Propagation*, Vol. 1, October 2020, pp. 549 – 559.
- D. Brizi, N. Fontana, M. Tucci, S. Barmada, A. Monorchio, **“A Spiral Resonators Passive Array for Inductive Wireless Power Transfer Applications with Low Exposure to Near Electric Field”**, *IEEE Transactions on EMC*, Vol. 62, No. 4, pp. 1312 – 1322, August 2020.
- A. Sarraj, W. Dghais, S. Barmada, M. Tucci, M. Raugi, **“Harmonic Distortion Considerations for an Integrated WPT-PLC System”**, *Wireless Power Transfer*, Cambridge, Vol. 7, No 1, pp. 33 – 41, March 2020.
- S. Barmada, N. Fontana, L. Sani, D. Thomopoulos, M. Tucci, **“Deep Learning and Reduced Models for Fast Optimization in Electromagnetics”**, *IEEE Transactions on Magnetics*, Vol. 56, No. 3, pp. 1 – 4, March 2020.

- S. Barmada, N. Fontana, D. Thomopoulos, M. Tucci, “**Autoencoder Based Optimization for Electromagnetics Problem**”, *The Applied Computational Electromagnetics Society Journal*, Vol. 34, No. 12, pp. 1875 – 1880, December 2019.
- S. Barmada, W. Dghais, N. Fontana, M. Raugi, M. Tucci, “**Design and Realization of a Multiple Access Wireless Power Transfer System for Optimal Power Line Communication Data Transfer**”, *Energies*, 2019, Vol. 12, 988, pp. 1 – 19, March 2019.
- S. Barmada, M. Tucci, F. Romano, “**Transmission Channel Analysis for Broadband Communication over Multi-Conductor UIC Cables Onboard Regional Trains**”, *Energies*, Vol. 12, no. 3, pp. 1 – 14, January 2019.
- S. Barmada, M. Tucci, “**Theoretical Study of Different Access Points in coupled Wireless Power Transfer – Powerline Communication Systems**”, *The Applied Computational Electromagnetics Society Journal*, Vol. 33, No. 10, pp. 1112 – 1116, October 2018.
- L. Bai, M. Tucci, S. Barmada, M. Raugi, T. Zheng, “**Impulsive Noise Characterization in Narrowband Power Line Communication**” *Energies*, 2018, vol. 11, n. 4, pp. 1 – 17, 2018.
- A. Jain, S. Barmada, E. Crisostomi, F. Romano, F. Tavano, M. Tucci, “**Indirect monitoring and early detection of faults in trains motors**”, *IET Electrical Systems in Transportation*, Vol. 8, no. 2, pp. 86 – 94, 2018.
- I. Aydin, S. B. Celebi, S. Barmada, M. Tucci, “**Fuzzy Integral Based Multi-Sensor Fusion for Arc Detection in the Pantograph-Catenary System**”, *Proceedings of the Institution of Mechanical Engineers Part. F: J. Rail and Rapid Transit*, Vol. 232, No. 1, pp. 159 – 170. January 2018.
- S. Barmada, M. Dionigi, M. Tucci, P. Mezzanotte, “**Design and Experimental Characterization of a Combined WPT - PLC System**”, *Wireless Power Transfer, Cambridge*, vol. 4, no. 2, pp. 160 - 170, 2017.
- S. Barmada, M. Raugi, M. Tucci, “**A multi-objective optimization algorithm based on self-organizing maps applied to wireless power transfer systems**”, *International Journal of Numerical Modelling: Electronic Networks, Devices and Fields*, Vol. 30, Issue 3-4, May 2017
- G. Braglia, A. Duffy, S. Barmada, “**Simulation Validation of Experimental Tests for Automotive System EMC Developmental Tests**”, *Applied Computational Electromagnetics Society Journal*, Vol. 31, No. 9, pp. 1028 – 1034, 2016
- S. Barmada, M. Raugi, M. Tucci, “**An evolutionary algorithm for global optimization based on self-organizing maps**”, *Engineering Optimization*, Vol 48, Issue 10, pp. 1740 – 1758, 2016.
- S. Barmada, M. Tucci, M. Menci, F. Romano “**Clustering techniques applied to a high-speed train’s pantograph–catenary subsystem for electric arc detection and classification**” *Proceedings of the Institution of Mechanical Engineers Part. F: J. Rail and Rapid Transit*, Vol. 230 (I), pp. 85 – 96, 2016

- S. Barmada, M. Tucci, F. Romano, “**Hierarchical Clustering applied to Measured Data Relative to Pantograph-Catenary Systems as a Predictive Maintenance Tool**”, *International Journal of Railway Technology*, Vol. 3, no. 4, pp. 23 – 41, 2014
- S. Barmada, M. Raugi, M. Tucci, F. Romano “**Arc detection in pantograph-catenary systems by the use of support vector machines-based classification**”, *IET Electrical Systems in Transportation*, Volume 4, n. 2, pp. 45 - 52, 2014
- S. Barmada, M. Raugi, R. Rizzo, M. Tucci “**Channel evaluation for power line communication in plug – in electric vehicles**”, *IET Electrical Systems in Transportation*, Volume 2, n. 4, pp. 195 - 201, 2012
- S. Barmada, A. Musolino, R. Rizzo, M. Tucci “**Multi-resolution based sensitivity analysis of complex non-linear circuits**”, *IET Circuits, Devices & Systems*, Volume 6, n. 3, pp. 176 - 186, 2012
- R. Araneo, S. Barmada “**Advanced Image Processing Techniques for the Discrimination of Buried Objects**”, *Applied Computational Electromagnetics Society Journal*, Volume 26, n. 5, pp. 437 - 446, 2011
- S. Barmada, A. Musolino, M. Raugi, M. Tucci “**A Delta-Method Technique in the Wavelet Domain to Determine Statistical Quantities of the Response of Electromagnetic Devices with Uncertain Parameters**”, *International Journal of Numerical Modelling: Electronic Networks, Devices and Fields*, Volume 24, pp. 357 - 374, 2011
- S. Barmada, A. Musolino, M. Raugi, R. Rizzo, M. Tucci “**A Wavelet Based Method for the Analysis of Impulsive Noise due to Switch Commutations in Power Line Communication (PLC) Systems**”, *IEEE Transactions on Smart Grid*, Vol. 2, Issue 1, 2011, Pages 92 – 101
- S. Barmada, L. Bellanti, M. Raugi, M. Tucci “**Analysis of Power-Line Communication Channels in Ships.**”, *IEEE Transactions on Vehicular Technology*, Vol. 59, Issue 7, 2010, Pages 3161 – 3170
- R. Araneo, S. Barmada, A. Musolino “**Analysis of Equivalent Circuit Sensitivity on Extraction Procedure.**”, *Electromagnetics*, Vol. 30, Issue 4, 2010, Pages 324 – 346
- S. Barmada, A. Gaggelli, P. Masini, A. Musolino, R. Rizzo, M. Tucci “**Modeling of UIC Cables in Railway Systems for their Use as Power Line Communications Channel.**”, *The Applied Computational Electromagnetics Society Journal*, Vol. 24, No. 6, December, 2009, pp. 609 – 617
- S. Barmada, R. Rizzo, L. Sani “**Didactic Considerations on Magnetic Circuits Excited by Permanent Magnets**”, *IEEE Transactions on Education*, Vol. 52 n. 4, pp. 532- 537, November 2009
- S. Barmada, A. Musolino, M. Tucci “**Response bounds of Indoor Power Line Communication Systems with Cyclostationary Loads**”, *IEEE Transactions on Power Delivery*, Vol. 24 n. 2, pp. 596 - 603, April 2009

- S. Barmada, M. Raugi, A. Musolino, M. Tucci “**Modeling of Nonlinearly Loaded Microwave Devices by a Wavelet Convolution Operator-Based Formulation**”, *Electromagnetics*, Vol. 29 n. 1, pp. 31 - 52, 2009
- S. Barmada, M. Raugi, A. Musolino, M. Tucci, F. Turcu “**Hilbert Huang and Wavelet Processing of Time Domain Signals from Ultrasonic Guided Waves Magnetostrictive Sensors Arrays**”, *International Journal of Circuits, Systems and Signal Processing*, Vol. 1 n. 4, pp. 327 - 333, 2007
- S. Barmada, M. Raugi, A. Musolino, M. Tucci “**Analysis of Power Lines Uncertain Parameter Influence on Power Line Communications**”, *IEEE Transactions on Power Delivery*, Vol. 22 n. 4, pp. 2163 - 2171, October 2007
- S. Barmada “**Improving the Performance of the Boundary Element Method with Time Dependent Fundamental Solutions by the Use of a Wavelet Expansion in the Time Domain**”, *International Journal of Numerical Methods in Engineering*, Vol. 71 n. 3, pp. 363 - 378, July 2007
- S. Barmada, M. Raugi, A. Musolino “**Simulation of Non Linear Circuits by the Use of a State Variable Approach in the Wavelet Domain**”, *Applied Computational Electromagnetic Society Journal*, Vol. 22 n. 1, pp. 147 – 154, March 2007.
- S. Barmada, M. Raugi, A. Musolino “**Analysis of Integrated Circuit Systems by an Innovative Wavelet Based Scattering Matrix Approach**”, *IEEE Transactions on Advanced Packaging*, Vol. 30 n. 1, pp. 86 - 96, February 2007.
- S. Barmada, M. Raugi, A. Musolino “**Innovative Model for Time-Varying Power Line Communication Channel Response Evaluation**”, *IEEE Journal on Selected Areas in Communications*, Vol. 24 n. 7, pp. 1317 - 1326, July 2006.
- S. Barmada, A. Musolino, R. Rizzo “**Equivalent Network Approach for the Simulation of MEMS Devices**”, *Applied Computational Electromagnetic Society Journal*, Vol. 21 n. 1, pp. 16 - 25, March 2006.
- S. Barmada “**Comments on “Deficiencies in the Way Scattering Parameters Are Taught”**”, *IEEE Transaction on Education*, Vol. 49 n. 1, pp. 176 - 178, February 2006.
- S. Barmada, A. Musolino, M. Raugi, “**Wavelet Based Time Domain Solution of Multiconductor Transmission Lines With Skin and Proximity Effect**”, *IEEE Transaction on Electromagnetic Compatibility*, Vol. 47 n. 4, pp. 774 – 780, November 2005.
- S. Barmada, A. Musolino, M. Raugi, “**Response Bounds Analysis for Transmission Lines Characterized by Uncertain Parameters**”, *Applied Computational Electromagnetic Society Journal*, Vol. 20 n. 3, pp. 213 – 220, November 2005.
- S. Barmada, L. Di Rienzo, N. Ida, S. Yuferev “**Time Domain Surface Impedance Concept for Low Frequency Electromagnetic Problems—Part II: Application to transient skin and**

proximity effect problems in cylindrical conductors", *IEE Proceedings - Science, Measurement and Technology*, Volume 152, n. 5, pp. 207 – 216, September 2005.

- S. Barmada, G. Becherini, A. Musolino, M. Raugi **"Influence of Parameters Uncertainties in Equivalent Circuit Modeling of 3D Electromagnetic Devices"**, *Journal of Electromagnetic Waves and Applications*, Volume 19 n. 15, pp. 2049 – 2058, 2005.
- R. Araneo, S. Barmada, S. Celozzi, M. Raugi **"Two Port Equivalent for PCB Discontinuities in the Wavelet Domain"**, *IEEE Transactions on Microwave Theory and Techniques*, Volume 53 n. 3, pp. 907 – 918, March 2005.
- S. Barmada, A. Musolino, M. Raugi, R. Rizzo **"Numerical Simulation of a Complete Generator – Rail Launch System"**, *IEEE Transactions on Magnetics*, Volume 41 n. 1, pp. 369 – 374, January 2005.
- S. Barmada, L. Di Rienzo, N. Ida, S. Yuferev, **"The Use of Surface Impedance Boundary Conditions in Time Domain Problems: Numerical and Experimental Validation"**, *Applied Computational Electromagnetic Society Journal*, Vol. 19 n. 2, pp. 76 – 83, July 2004.
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- S. Barmada, M. Raugi, **"Analysis of Scattering Problems by MOM with Intervallic Wavelets and Operators"**, *Applied Computational Electromagnetic Society Journal*, Volume 18 n. 4, pp. 62 – 67, November 2003.
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- S. Barmada, M. Raugi: **"New Wavelet Based Approach for Time Domain Simulations"**, *IEEE Transactions on Antennas and Propagation*, , Volume 51 n. 7, pp. 1590 – 1598, July 2003.
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- S. Barmada: **“Field Analysis in Tubular Coilguns by Wavelet Transform”**, *IEEE Transactions on Magnetics*, Volume 39 n. 1, pp. 120 – 124, January 2003.
- S. Barmada, M. Raugi: **“Simulation of Nonuniform High-Speed Interconnects with Frequency Dependent Parameters by Wavelets on the Interval”**, *Applied Computational Electromagnetics Society Newsletter*, Volume 17 n. 3, pp. 8 – 21, November 2002.
- S. Barmada: **“Algebraic Solution of Time Domain Nonuniform Transmission Lines Equations by 2D Wavelet transform”**, *IEEE Transactions on Circuits and Systems I*, Volume 49 n. 4, pp. 504 – 508, April 2002.
- S. Barmada, A. Musolino, M. Raugi, R. Rizzo: **“Numerical Solution of Maxwell Equations by Wavelets on the Interval and Equivalence Theorem”**, *IEEE Transactions on Magnetics*, Volume 38 n. 2, pp. 381 – 384, March 2002.
- S. Barmada, A. Musolino, M. Raugi, R. Rizzo: **“Force and Torque Evaluation in Hybrid FEM MOM Formulations”**, *IEEE Transactions on Magnetics*, Volume 37 n. 5 Part 1, pp. 3108 – 3111, September 2001.
- S. Barmada, M. Raugi: **“Space Time Wavelet Expansion Iterative Solution of Nonuniform Transmission Lines with Arbitrary Load”**, *International Journal of Numerical Modelling: Electronic Networks, Devices and Fields*, Volume 14 n. 3, pp. 219-235, 2001.
- S. Barmada, A. Musolino, M. Raugi: **“Field Excited Multiconductor Transmission Lines: a Wavelet Approach”**, *COMPEL*, Volume 20 n. 2, pp. 380 – 394, 2001.
- S. Barmada, A. Musolino, M. Raugi, R. Rizzo: **“Analysis of the Performance of a Multi – Stage Pulsed Linear Induction Launcher”**, *IEEE Transactions on Magnetics*, Volume 37 n. 1 Part 1, pp. 111 – 115, January 2001.
- S. Barmada, M. Raugi: **“Transient Numerical Solutions of Nonuniform MTL Equations with Nonlinear Loads by Wavelet Expansion in Time or Space Domain”**, *IEEE Transactions on Circuits and Systems I*, Volume 47 n. 8, pp. 1178 – 1190, August 2000.
- S. Barmada, A. Musolino, R. Rizzo, A. Tellini: **“Fields Analysis in Axysymmetric Actuators”**, *IEEE Transactions on Magnetics*, Volume 36 n. 4 Part 1, pp. 1906 – 1909, July 2000.
- S. Barmada, A. Musolino, M. Raugi: **“Hybrid FEM-MOM Formulation for Eddy Current Problem with Moving Conductor”**, *IEEE Transactions on Magnetics*, Volume 36 n. 4 Part 1, pp. 827 – 830, July 2000.
- S. Barmada, A. Musolino, M. Raugi: **“Hybrid F.E. - Wavelet Method for Nonlinear Analysis of Nonuniform MTL Transients”**, *IEEE Transactions on Magnetics*, Volume 36 n. 4 Part 1, pp. 977 – 981, July 2000.

- S. Barmada, M. Raugi: **“A General Tool for Circuit Analysis Based on Wavelet Transform”**, *International Journal of Circuit Theory and Applications*, Volume 28 n. 5, pp. 461 – 480, 2000.
- S. Barmada, A. Musolino, F. Nencioni, R. Rizzo, A. Tellini: **“Design of a Two-axes Active Electromagnetic Sidestick Actuating System”**, *COMPEL*, Volume 19 n. 2, pp. 582 - 588, 2000.
- S. Barmada, A. Musolino, F. Nencioni, R. Rizzo, A. Tellini: **“Analysis of Non-linear Electrostatic Devices by a Hybrid FEM-MOM Formulation”**, *COMPEL*, Volume 19 n. 2, pp. 217 - 223.
- S. Barmada, A. Musolino, R. Rizzo, B. Tellini: **“A Hybrid Formulation for Nonlinear Magnetostatic Analysis”**, *Studies in Applied Electromagnetics and Mechanics*, Volume 18, pp. 343 – 346, IOS Press, 2000
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- S. Barmada, M. Raugi, A. Tellini: **“Transient Analysis of Plane Wave Propagation by Wavelets on the Interval”**, *Studies in Applied Electromagnetics and Mechanics*, Volume 18, pp. 339 – 342, IOS Press, 2000.