



**POLITECNICO
DI TORINO**

Dipartimento di
Elettronica e
Telecomunicazioni



Curriculum Vitae

<i>Surname Name</i>	Riccardo Trincherò
Birth date and place	July, 1st 1987 – Casale (AL) 28021, Italy
Domicile	Corso Casale 16B, Trino (VC) 13039, Italy
E-mail	riccardo.trincherò@polito.it
ORCID ID	https://orcid.org/0000-0002-1838-2591
Scopus Author ID	57202657964
Web of Science ResearcherID	F-3633-2017

Education and Professional Experience (in reverse chronological order)

Nov-2019 to present

Assistant Professor (RTD-B) at **Politecnico di Torino**, Italy. Professor of Circuit Theory.

Nov-2016 to Oct-2019

Assistant Professor (RTD-A) at **Politecnico di Torino**, Italy. Professor of Circuit Theory.

June-2015 to Oct-2016

Postdoctoral Research at **Istituto Nazionale di Fisica Nucleare (INFN, Turin)** founded by the TRIMAGE FP7/2007-2013 project under grant agreement n° 602621. The research activity focused on the design and the development of the electromagnetic shielding system for the TRIMAGE scanner.

Apr-2015 to June-2015

Postdoctoral Research Assistant at **Politecnico di Torino**, Italy, for the research project entitled "Standardization methodologies for electronic devices virtual prototyping". The research activity mainly concerned the development of models and simulation techniques for switching converters and DC-motors.

Jan-2012 to March-2015

PhD degree in **Electronics and Communications Engineering** at **Politecnico di Torino**, Italy. Thesis title: "EMI Analysis of Switching Circuit". The research activity concerned the development of an alternative novel technique for the analysis, modelling and simulation of the conducted emissions generated by switching circuits and converters.

Academic year 2010/2011 to Dec-2011

Master degree (with highest honors) in **Electronics Engineering** at **Politecnico di Torino**, Italy. Thesis title: "Characterization of EMI Sources Using a Two-Probe Approach".

Academic year 2009/2010 to Jan-2010

Baccalaureate degree in **Electronics Engineering** at **Politecnico di Torino**, Italy. Thesis title: "Modeling and Simulation of Field-Circuit".

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Other academic experience: research stays abroad

11-Dec-2019 to 15-dec-2019

"Visiting Scholar" at **Xi'an Jiaotong University, Xi'an, Cina**, in the framework of a joint research activity concerning the development of ML techniques for EMC applications.

02-Jul-2019 to 28-Aug-2019

03-Sept-2018 to 01-Nov-2018

"Visiting Scholar" at **Georgia Institute of Technology, GA, USA**, in the framework of a joint research project concerning the development of an innovative framework for the black-box modeling of complex systems based on machine learning regressions

05-Aug-2018 to 08-Aug-2018

"Visiting Scholar" at **Intel "Am Campeon" office, Munich, Germany**, in the framework of a joint research project concerning the development and the validation of several behavioral models for a set of transceivers provided by Intel, along with a 3D model for their packaging

Several times from 2015 to 2016

"Visiting postdoctoral researcher" at **Forschungszentrum Julich, Julich, Germany**, in the framework of a joint research activity concerning the EMC measurements in magnetic resonance environment for electromagnetic characterization of the shielding system within the TRIMAGE project.

04-Jul-2012 to 06-Jul-2012

"Visiting Student" at the **IBM Bruxelles office, Bruxelles, Belgium**, for the 2012 EMEA Best Student Recognition Event (BSRE) dedicated to Big Data Analysis. The event was organized to bring together at IBM Brussels the top students from across Europe, Middle East and Africa.

Research Awards

10-12-May-2021

Best Student Paper Award at the 25th IEEE Workshop on Signal and Power Integrity, (SPI 2021), Virtual Online Conference, for the paper: F. Treviso, R. Trincherro, and F. G. Canavero, "Bayesian Optimization of Hyperparameters in Kernel-Based Delay Rational Models".

20-23-Oct-2020

Best Student Paper Award at the 6th IEEE Global Electromagnetic Compatibility Conference (GEMCCON 2020), Xi'An (China) for the paper: Z.A. Memon, R. Trincherro, P. Manfredi, F. Canavero, I.S. Stievano, and Y. Xie, "Machine learning for the uncertainty quantification of power networks".

31-Aug-2020/3-Sept-2020

Honorable Mention at the 2020 URSI General Assembly and Scientific Symposium, (USRSI 2020), Rome, Italy, for the paper: F. Treviso, R. Trincherro, and F.G. Canavero, "Machine Learning Applied to the Blind Identification of Multiple Delays in Distributed Systems".

18-21-Jun-2019

Best Paper Award at the 23rd IEEE Workshop on Signal and Power Integrity, (SPI 2019), Chambéry, France, for the paper: R. Trincherro, M. Larbi, M. Swaminathan and F. G. Canavero, "Statistical Analysis of the Efficiency of an Integrated Voltage Regulator by means of a Machine Learning Model Coupled with Kriging Regression".

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09-11-Jul-2018

Best Paper Award at the 19ème Colloque International & Exposition sur la Compatibilité Electromagnétique, (CEM 2018), Paris, France, for the paper: R. Trincherò, and F. Canavero, "Quantification of Uncontrolled Large Variations of Parameters on System Performance via Support Vector Machine Surrogates".

04-06-Jul-2012

Selected for the 2012 **EMEA Best Student Recognition Event (BSRE)**, Bruxelles, Belgium, July 2012

Research Projects

16-06-2020 – 02-02-2021

R&D Project, HUAWEI TECHNOLOGIES OY (FINLAND) CO. LTD – POLITO, "Physical simulation models for electrical grounding contacts (2nd phase)". **Role: Principal Investigator** (~47kEuro)

25/09/2019 – 26/03/ 2020

R&D Project, HUAWEI TECHNOLOGIES OY (FINLAND) CO. LTD – POLITO, "Physical simulation models for electrical grounding contacts". **Role: Principal Investigator** (~46kEuro)

24-07-2018 – 29-01-2020

Research Project for the Program for Internalization of Research 2018 (2018-2019), "Machine Learning to Improve the Reliability of Complex Systems" in partnership with Prof. Madhavan Swaminathan, Georgia Tech Institute of Atlanta. **Role: Principal Investigator** (~50kEuro)

Nov-2017 – Feb-2020

R&D Project European Space Agency (ESA) – POLITO, "Stochastic Characterization of the susceptibility of SpaceWire (SpW) links to common mode", Role: Team Member

Nov-2017 – Dec-2019

R&D Project Intel "Am Campeon" office – POLITO "Macromodeling and Simulations of I/O Buffers and Interconnections in Signal and Power Integrity Analysis", Role: Team Member

Nov/2016 – Sep/2017

R&D Project Nippon Soken, Inc. – POLITO "Stochastic Modeling of Automotive Immunity", Role: Team Member.

May-2015 – Nov-2016

European Project "TRIMAGE: A dedicated trimodality (PET/MR/EEG) imaging tool for schizophrenia" (2015-2016) European Union Seventh Framework Programme Programme (FP7/2007-2013) under grant agreement n° 602621. Role: Member of the Task Group 2 (TG2): EM Compatibility.

Oct-2014 – Nov-2014

R&D Project General Cab S.r.l. – POLITO, "Impedance Measurement of Axial Ferrite Beads", Role: Team Member

Jul-2012 – Jul-2014

R&D Project Sorin Group S.p.a. – POLITO "Impedance Measurements of Pacemakers", Role: Team Member

Nov-2012 – Mar-2013

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European Project "High Intensity Radiated Fields (HIRF) Synthetic Environment (SE)", European Union Seventh Framework Programme (FP7/2007-2013) under grant agreement n° 205294. Role: team member

Ph.D. Students

- 1- Felipe Treviso: "ML for the modeling of LTI circuits", Expected Graduation Date: 2022
- 2- Mosrafa Sedaghat: "Inverse Modeling optimization based on Compress Models", Expected Graduation Date: 2022
- 3- Amir Attar: "ML regression with noisy data", Expected Graduation Date: 2023
- 4- Nastaran Soleimani: "ML-based surrogate model for complex valued data", Expected Graduation Date: 2022

Talks

10-12-May-2021

Tutorial speaker (plenary session) at the 25th Workshop on Signal and Power Integrity, (SPI 2021), Virtual Conference, with the talk "Demystifying Machine Learning for Signal and Power Integrity Applications"

20-Feb-2020

Invited speaker at the webinar "EMC Frontier Topics and Challenges" Xi'an Jiaotong University, Xi'an, Cina, with the talk "Design of Passive Equalizer for SpaceWire Links via Support Vector Machine".

16-18-Dec-2019

Workshop speaker at the IEEE Conference on Electrical Design of Advanced Packaging and Systems, (EDAPS 2019), Kaohsiung, Taiwan, for the workshop "Machine Learning – Is it really useful for Electronic Design?" with the talk "Design of Electronic Devices and Systems via Machine Learning-Based Surrogate Model".

13-Dec-2019

Invited seminar entitled "EMC Frontier Workshop" at the Xi'an Jiaotong University, Xi'an, China.

2-6-Sep-2019

Tutorial speaker at the IEEE International Symposium on Electromagnetic Compatibility (EMC EUROPE 2019), Barcelona, Spain, for the tutorial "EMI and power quality issues in Smart Cities and Transportation Systems" with the talk "EMI modeling of switching circuits via augmented equivalents".

19-21-June-2019

Invited speaker (plenary session) at the "XXXV Edizione della Riunione Annuale del Gruppo Elettrotecnica", ET2019, Viterbo, Italy, with the talk "Machine Learning for the Uncertainty Quantification in Complex electronic systems".

10-11-Dec-2018

Keynote speaker (plenary session) at the 4th Workshop on Uncertainty Modeling for Engineering Applications, (UMEMA 2018), Split, Croatia, with the talk "SVM and LS-SVM for the uncertainty quantification of complex systems".

Teaching and Other Academic Activities

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Academic year 2019/2020 to present

Chair Professor in the doctoral course **Spectral and machine learning methods for uncertainty quantification** at **Politecnico di Torino**, Italy

Academic year 2019/2020 to present

Chair Professor of **Circuit Theory** for Bachelor courses at **Politecnico di Torino**, Italy

Academic year 2016/2017 to 2018/2019

Professor of **Circuit Theory** for Bachelor courses at **Politecnico di Torino**, Italy

Editorial and Organizational Activities, and Other Distinctions

Jan-2021 to present

Topic Editor for the journal **Energies**

Dec-2020 to present

Academic Guest Editor for the Special Issue Advanced Techniques for the "Modeling and Simulation of Energy Networks" for the journal **Energies**

2017 to present

Member of the **Technical Program Committee (TPC)** of the IEEE Workshop on Signal and Power Integrity (SPI).

Chair of the Award committee of the 6th IEEE Global Electromagnetic Compatibility Conference (GEMCCON 2020), Xi'an, China

Member of the **Best Paper committee** of the IEEE Conference on Electrical Design of Advanced Packaging and Systems, (EDAPS 2019), Kaohsiung, Taiwan.

Member of the **Technical Program Committee (TPC) of the** IEEE Conference on Electrical Design of Advanced Packaging and Systems Symposium (EDAPS2018)

Co-organizer of a **special session** entitled "Emerging Machine Learning Techniques for CAD of RF/Microwave Circuits" at the IEEE International Microwave Symposium (IMS 2021), Atlanta, GA (USA).

Session Chair or Co-Chair at the following IEEE conferences:

- IEEE International Symposium on Electromagnetic Compatibility (EMC EUROPE 2020),
- IEEE Global Electromagnetic Compatibility Conference (GEMCCON 2020)
- IEEE International Microwave Symposium (IMS 2021)

May-2015 to present

Regular **reviewer** for the following SCI-indexed journals:

- IEEE Transactions on Circuits and Systems, Part I: Regular Papers
- IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems
- IEEE Transactions on Components, Packaging and Manufacturing Technology
- IEEE Transactions on Electromagnetic Compatibility
- IET Circuits Devices & Systems
- IEEE Transaction on Power Electronics
- IET Power Electronics
- IEEE Transaction on Industrial Electronics

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- Mathematical Problems in Engineering
- Electronics

Publications List

Below is a list of papers published peer-reviewed international journals. The scientific output also includes over 20 publications in conference proceedings (omitted here).

- J1. R. Trinchero, M. Larbi, M. Swaminathan and F. G. Canavero, "Statistical Analysis of the Efficiency of an Integrated Voltage Regulator by Means of a Machine Learning Model Coupled with Kriging Regression," in IEEE Electromagnetic Compatibility Magazine, vol. 10, no. 1, pp. 72-75, 1st Quarter 2021
- J2. F. Treviso, R. Trinchero and F. G. Canavero, "Bayesian Optimization of Hyperparameters in Kernel-Based Delay Rational Models," in IEEE Electromagnetic Compatibility Magazine, vol. 10, no. 2, pp. 90-93, 2nd Quarter 2021
- J3. F. Treviso, R. Trinchero, and F. G. Canavero, "Multiple delay identification in long interconnects via ls-svm regression," IEEE Access, vol. 9, pp. 39 028–39 042, 2021.
- J4. R. Trinchero, I. S. Stievano, and F. G. Canavero, "Enhanced time-invariant linear model for the EMII prediction of switching circuits," IEEE Transactions on Electromagnetic Compatibility, vol. 62, pp. 2294–2302, 2020.
- J5. R. Trinchero and F. G. Canavero, "Combining LS-SVM and GP regression for the uncertainty quantification of the emi of power converters affected by several uncertain parameters," IEEE Transactions on Electromagnetic Compatibility, vol. 62, pp. 1755–1762, 2020
- J6. Z. A. Memon, R. Trinchero, P. Manfredi, F. Canavero, and I. S. Stievano, "Compressed machine learning models for the uncertainty quantification of power distribution networks," Energies, vol. 13, 2020.
- J7. P. Manfredi, R. Trinchero, and D. Vande Ginste, "A perturbative stochastic galerkin method for the uncertainty quantification of linear circuits," IEEE Transactions on Circuits and Systems. I, Regular Papers, vol. 67, pp. 2993–3006, 2020.
- J8. P. Manfredi and R. Trinchero, "A data compression strategy for the efficient uncertainty quantification of time-domain circuit responses," IEEE Access, vol. 8, pp. 92 019–92 027, 2020.
- J9. Z. A. Memon, R. Trinchero, Y. Xie, F. G. Canavero, and I. S. Stievano, "An iterative scheme for the power-flow analysis of distribution networks based on decoupled circuit equivalents in the phasor domain," Energies, vol. 13, 2020.
- J10. R. Trinchero, I. S. Stievano, and F. G. Canavero, "Black-box modeling of the maximum currents induced in harnesses during automotive radiated immunity tests," IEEE Transactions on Electromagnetic Compatibility, vol. 62, pp. 627–630, 2020.
- J11. M. Larbi, R. Trinchero, F. G. Canavero, P. Besnier, and M. Swaminathan, "Analysis of parameter variability in an integrated wireless power transfer system via partial least-squares regression," IEEE Transactions on Components, Packaging, and Manufacturing Technology, vol. 10, pp. 1795–1802, 2020.
- J12. C. Siviero, R. Trinchero, S. Grivet-Talocia, I. S. Stievano, G. Signorini, and M. Telescu, "Constructive signal approximations for fast transient simulation of coupled channels," IEEE Transactions on Components, Packaging, and Manufacturing Technology, vol. 9, pp. 2087–2096, 2019.
- J13. R. Trinchero, M. Larbi, H. M. Torun, F. G. Canavero and M. Swaminathan, "Machine Learning and Uncertainty Quantification for Surrogate Models of Integrated Devices With a Large Number of Parameters," in IEEE Access, vol. 7, pp. 4056–4066, 2019.
- J14. S. Grivet-Talocia and R. Trinchero, "Behavioral, Parameterized, and Broadband Modeling of Wired Interconnects With Internal Discontinuities," in IEEE Transactions on Electromagnetic Compatibility, vol. 60, no. 1, pp. 77-85, Feb. 2018

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- J15.R. Trincherò, P. Manfredi, I. S. Stievano and F. G. Canavero, "Machine Learning for the Performance Assessment of High-Speed Links," in IEEE Transactions on Electromagnetic Compatibility, vol. 60, no. 6, pp. 1627-1634, Dec. 2018.
- J16. A. Del Guerra, et al., "TRIMAGE: A dedicated trimodality (PET/MR/EEG) imaging tool for schizophrenia", European Psychiatry," Vol. 50, pag. 7-20, April 2018. (doi: <https://doi.org/10.1016/j.eurpsy.2017.11.007>)
- J17.R. Trincherò, P. Manfredi and I. S. Stievano, "Self-Validated Time-Domain Analysis of Linear Systems with Bounded Uncertain Parameters," in IEEE Transactions on Circuits and Systems II: Express Briefs, vol. 65, no. 11, pp. 1499-1503, Nov. 2018.
- J18.A. Berneking, R. Trincherò, H. YongHyun, F. Finster, P. Cerello, C. Lerche, and N. J. Shah "Design and Characterization of a Gradient-Transparent RF Copper Shield for PET Detector Modules in Hybrid MR-PET Imaging," in IEEE Transactions on Nuclear Science, vol. 64, no. 5, pp. 1118-1127, May 201
- J19.R. Trincherò, P. Manfredi, and I.S. Stievano, "TMsim: an algorithmic tool for the parametric and worst-case simulation of systems with uncertainties," Mathematical Problems in Engineering, vol. 2017, Article ID 6739857, 12 pages, 2017. DOI: 10.1155/2017/6739857
- J20. R. Trincherò, P. Manfredi, I.S. Stievano, and F.G. Canavero, "Steady-state analysis of switching converters via frequency-domain circuit equivalents," IEEE Transactions on Circuits and Systems, Part II: Express Briefs, vol. 63, no. 8, pp. 748-752, August 2016.
- J21.R. Trincherò, P. Manfredi, T. Ding, and I.S. Stievano, "Combined parametric and worst-case circuit analysis via Taylor models," IEEE Transactions on Circuits and Systems, Part I: Regular Papers, vol. 63, no. 7, pp. 1067-1078, July 2016.
- J22.T. Ding, R. Trincherò, P. Manfredi, I.S. Stievano, and F.G. Canavero, "How affine arithmetic helps beat uncertainties in electrical systems," IEEE Circuits and Systems Magazine, vol. 15, no. 4, pp. 70-79, November 2015.
- J23.R. Trincherò, I. S. Stievano and F. G. Canavero, "EMI Prediction of Switching Converters," in IEEE Transactions on Electromagnetic Compatibility, vol. 57, no. 5, pp. 1270-1273, Oct. 2015.
- J24.R. Trincherò, I.S. Stievano, F.G. Canavero, "Steady-State Response of Periodicaly Linear Circuits via Augmented Time-Invariant Nodal Analysis", Journal of Electrical and Computer Engineering, vol. 2014, Article ID 198273, 11 pages, 2014. doi: 10.1155/2014/198273.

Date: 09/08/2021

Signature _____

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