Piero Triverio

Full Professor

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Research interests

- **Computational modeling of complex systems** arising in engineering and life sciences.
- **Computational electromagnetism**. *Applications*: design automation for integrated circuits, antennas, metamaterials, quantum computing systems.
- **Computational fluid dynamics**, simulations driven by medical images. *Applications*: modeling of cardiovascular diseases, personalized medicine.

Current position

2022 - **Full Professor**, *University of Toronto*, Canada
Department of Electrical and Computer Engineering (July 2017 - present)
Institute of Biomedical Engineering (cross-appointment, non-budgetary, July 2018 - present)
Department of Mechanical & Industrial Engineering (cross-appointment, non-budgetary, November 2021 - present)
Cardiovascular Sciences Collaborative Specialization (October 2019 - present)

Previous position

2018 - 2023 **Canada Research Chair in Computational Electromagnetics**

2017 - 2022 **Associate Professor**, *University of Toronto*, Canada

2011 - 2017 **Assistant Professor**, *University of Toronto*, Canada

2013 - 2018 **Canada Research Chair in Modeling of Electrical Interconnects**

Education

2009 **Ph.D. in Electronic Engineering and Communications**, *Politecnico di Torino*, Italy
Advisor: Prof. S. Grivet-Talocia *Thesis title:* Self consistent, efficient and parametric macromodels for high-speed interconnects design

2005 **Laurea Specialistica in Electronic Engineering**, *Politecnico di Torino*, Italy
Grade: summa (110/110) cum laude with honors and dignity of publication

Research experience

2009-2011 **Post-doctoral fellow**, *Politecnico di Torino*, Italy
Advisor: Prof. S. Grivet Talocia

Nov 2010, June 2011 **Visiting researcher**, *Massachusetts Institute of Technology*, USA
Advisor: Prof. L. Daniel

2005, 2007, 2009 **Visiting student**, *Carleton University*, Ottawa, Canada
Advisor: Prof. M. Nakhla

Awards - Research (selected)

2024 **Best Paper Award**, 33rd IEEE Conference on Electrical Performance of Electronic Packaging and Systems (with D. Marek, Y. Li, J. Hatton)

2021 **2021 Piergiorgio L. E. Uslenghi Letters Prize Paper Award**, (with S. Sharma)
For [J19], chosen among about 500 manuscript published in 2020.

2018 **Canada Research Chair in Computational Electromagnetics**

2017 **Best Paper Award**, 26th IEEE Conference on Electrical Performance of Electronic Packaging and Systems (with U. Patel, S. Sharma, S. Yang and S. Hum)

2016 **Ontario Early Researcher Award**

2013 **Canada Research Chair in Modeling of Electrical Interconnects**

2013 **Connaught New Researcher Award**

2010 **EuMIC Young Engineer Prize**, 13th European Microwave Week, Paris, France

2008 **Best Paper Award**, IEEE 17th Topical Meeting on Electrical Performance of Electronic Packaging, San Jose, California

2007 **Best Paper Award of the IEEE Transactions on Advanced Packaging**

2006 **Best Student Paper Award**, IEEE 15th Topical Meeting on Electrical Performance of Electronic Packaging Scottsdale, AZ (USA)

2006 **OPTIME Award**, *Industry Association of Torino*

2005 **Top Student Recognition Event**, *IBM*, Böblingen, Germany

Awards - Teaching

2024 **Teaching Award**, *Engineering Science program*, University of Toronto

Awards won by students under my supervision (selected)

2024 **Best Benchmark Paper Award**, 33rd IEEE Conference on Electrical Performance of Electronic Packaging and Systems (with D. Marek, Y. Li, J. Hatton)

2023 **Best Benchmark Paper Award**, *Yongzhong Li*, 32nd IEEE Conference on Electrical Performance of Electronic Packaging and Systems

2023 **Honorable Mention**, *Damian Marek*, 2023 IEEE International Symposium on Antennas and Propagation

2022 **Best Benchmark Paper Award**, *Qinghao Zhang*, 31st IEEE Conference on Electrical Performance of Electronic Packaging and Systems

2022 **Best Student Paper Award**, *Shashwat Sharma*, 16th European Conference on Antennas and Propagation

2020 **2nd prize, Student Paper Contest**, *Shashwat Sharma*, 2020 URSI North American Radio Science Meeting

2020 **Honorable Mention**, *Shashwat Sharma*, 2020 IEEE International Symposium on Antennas and Propagation

2019 **Chinese Government Award for Outstanding Students Abroad**, *Xinyue Zhang*

2019 **Honorable Mention**, *Shashwat Sharma*, IEEE International Symposium on Antennas and Propagation

2019 **Honorable Mention**, *Utkarsh Patel*, IEEE International Symposium on Antennas and Propagation

2017 **Best Paper Award**, *Utkarsh Patel, Shashwat Sharma and Shunchuan Yang*, 26th IEEE Conference on Electrical Performance of Electronic Packaging and Systems

2017 **Best Student Paper Award**, *Utkarsh Patel*, 21st IEEE Workshop on Signal and Power Integrity

2017 **Honorable Mention**, *Utkarsh Patel*, IEEE International Symposium on Antennas and Propagation

2016 **Best Student Paper Award**, *Fadime Bekmambetova and Xinyue Zhang*, 25th IEEE Conference on Electrical Performance of Electronic Packaging and Systems

2015 **3rd Student Paper Prize**, *Jan B. Preibisch*, IEEE International Conference on Numerical Electromagnetic and Multiphysics Modeling and Optimization

Teaching experience

At the University of Toronto

Term	Class	Size	Evaluation†
	(Undergraduate level)		
Winter 2012	ECE259 Electricity and Magnetism	87	5.92 out of 7 (85%)
Fall 2012	ECE212 Circuit Analysis	107	6.02 out of 7 (86%)
Winter 2013	ECE259 Electricity and Magnetism	109	6.23 out of 7 (89%)
Fall 2013	ECE212 Circuit Analysis	95	4.40 out of 5 (88%)
Winter 2014	ECE259 Electricity and Magnetism	112	4.7 out of 5 (94%)
Fall 2014	ECE212 Circuit Analysis	124	4.4 out of 5 (88%)
Winter 2015	ECE259 Electricity and Magnetism	83	4.7 out of 5 (94%)
Winter 2016	ECE259 Electricity and Magnetism	98	4.7 out of 5 (94%)
Winter 2017	ECE259 Electricity and Magnetism	116	4.8 out of 5 (96%)
Winter 2017	ECE259 Electricity and Magnetism	118	4.6 out of 5 (92%)
Winter 2018	ECE259 Electricity and Magnetism	83	4.3 out of 5 (86%)
Winter 2020	ECE259 Electricity and Magnetism	102	4.5 out of 5 (90%)
Winter 2021	ECE259 Electricity and Magnetism	119	4.0 out of 5 (80%)
Winter 2022	ECE259 Electricity and Magnetism	151	4.6 out of 5 (92%)
Winter 2023	ECE221 Electricity and Magnetism	126	4.6 out of 5 (92%)
Winter 20204	ECE259 Electricity and Magnetism	270	4.5 out of 5 (90%)
	(Graduate level)		
Winter 2012	ECE1254 Modeling of Multiphysics Sys.	15	6.56 out of 7 (94%)
Winter 2013	ECE1254 Modeling of Multiphysics Sys.	16	6.42 out of 7 (92%)
Winter 2014	ECE1254 Modeling of Multiphysics Sys.	14	6.79 out of 7 (97%)
Fall 2014	ECE1254 Modeling of Multiphysics Sys.	9	4.8 out of 5 (96%)
Winter 2016	ECE1254 Modeling of Multiphysics Sys.	10	4.8 out of 5 (96%)
Winter 2018	ECE1254 Modeling of Multiphysics Sys.	12	4.5 out of 5 (90%)
Fall 2019	ECE1254 Modeling of Multiphysics Sys.	5	not enough respondents
Fall 2020	ECE1254 Modeling of Multiphysics Sys.	5	5.0 out of 5 (100%)
Fall 2021	ECE1254 Modeling of Multiphysics Sys.	6	5.0 out of 5 (100%)
Fall 2022	ECE1254 Modeling of Multiphysics Sys.	7	5.0 out of 5 (100%)
Fall 2023	ECE1255 Integral Eq. Methods Comput. EM	9	5.0 out of 5 (100%)

†: Average student evaluation for the question "What is your overall rating of the instructor as a teacher?'

At Politecnico di Torino

2010 Lecturer for "Calculus II" (undergraduate, in English)

2008 Lecturer for "Electric circuits I" (undergraduate, in English)

2005 Teaching Assistant, "Circuit Theory" (undergraduate, in Italian)

Publications

The names of the trainees that I have supervised or co-supervised are in bold

Book Chapters

[BC1] P. Triverio, "Vector Fitting," in *Handbook on Model Order Reduction*, P. Benner, S. Grivet-Talocia, A. Quarteroni, G. Rozza, W. H. A. Schilders, L. M. Silveira, Ed. Berlin: De Gruyter, 2021, pp. 275–310.

Full Refereed Journals (submitted)

Full Refereed Journals (published or in press)

[J1] M. Pourafkari, K. A. Connelly, S. Verma, C. D. Mazer, H. Teoh, A. Quan, S. G. Goodman, A. Rai, M. D. P. Deva, P. Triverio, L. A. T. Yan, and Y. Ge, "Empagliflozin and left atrial function in patients with type 2 diabetes mellitus and coronary artery disease: insight from the empa-heart cardiolink-6 randomized clinical trial," *Cardiovascular Diabetology*, vol. 23, no. 1, p. 319, 2024.

[J2] **Y. Li**, **D. Marek**, and P. Triverio, "MultiAIM: Fast Electromagnetic Analysis of Multiscale Structures using Boundary Element Methods," *IEEE Trans. Antennas Propag.*, vol. 72, no. 7, pp. 5877–5891, 2024.

[J3] **F. Bekmambetova** and P. Triverio, "Calculation and Conservation of Probability and Energy in the Numerical Solution of the Schrödinger Equation with the Finite-Difference Time-Domain Method," *IEEE Trans. Microw. Theory Techn.*, vol. 72, no. 4, pp. 2110–2129, 2024.

[J4] **E. Fevola**, T. Bradde, P. Triverio, and S. Grivet-Talocia, "A Vector Fitting Approach for the Automated Estimation of Lumped Boundary Conditions of 1D Circulation Models," *Cardiovascular Engineering and Technology*, vol. 14, no. 4, pp. 505–525, 2023.

[J5] **N. Tran-Nguyen**, A. Yan, S. Fremes, P. Triverio, and L. Jimenez-Juan, "Abnormal Wall Shear Stress Area is Correlated to Coronary Artery Bypass Graft Remodeling One Year After Surgery," *Annals of Biomedical Engineering*, vol. 51, no. 7, pp. 1588–1601, 2023.

[J6] **S. Sharma** and P. Triverio, "A Generalized Scalar Potential Integral Equation Formulation for the DC Analysis of Conductors," *IEEE Trans. Antennas Propag.*, vol. 75, no. 5, pp. 4326–4338, 2023.

[J7] **N. Tran-Nguyen**, **F. Condemi**, A. Yan, S. Fremes, P. Triverio, and L. Jimenez-Juan, "Wall Shear Stress Differences Between Arterial and Venous Coronary Artery Bypass Grafts One Month After Surgery," *Annals of Biomedical Engineering*, vol. 50, pp. pages 1882–1894, 2022.

[J8] **D. Marek**, **S. Sharma**, and P. Triverio, "A Parallel Boundary Element Method for the Electromagnetic Analysis of Large Structures With Lossy Conductors," *IEEE Trans. Antennas Propag.*, vol. 70, no. 11, pp. 10 736–10 750, 2022.

[J9] **S. Sharma** and P. Triverio, "Electromagnetic Modeling of Lossy Interconnects From DC to High Frequencies With a Potential-Based Boundary Element Formulation," *IEEE Trans. Microw. Theory Techn.*, vol. 70, no. 8, pp. 3847–3861, 2022.

[J10] **R. Gholami**, P. Naseri, P. Triverio, and S. V. Hum, "An Efficient Integral Equation Method for Full-wave Analysis of Inhomogeneous Electromagnetic Surfaces with Connected Conductors," *IEEE Trans. Antennas Propag.*, vol. 70, no. 7, pp. 5647–5658, 2022.

[J11] **F. Bekmambetova** and **X. Zhang** and P. Triverio, "Corrections to "A Dissipation Theory for Three-Dimensional FDTD With Application to Stability Analysis and Subgridding"," *IEEE Trans. Antennas Propag.*, vol. 70, no. 4, pp. 3132–3133, 2022.

[J12] **F. Bekmambetova** and P. Triverio, "A Dissipation Theory for Potentials-Based FDTD for Lossless Inhomogeneous Media," *IEEE Antennas Wireless Propag. Lett.*, vol. 21, no. 3, pp. 486–490, 2022.

[J13] **S. Sharma** and P. Triverio, "Electromagnetic Modeling of Lossy Materials with a Potential-Based Boundary Element Method," *IEEE Antennas Wireless Propag. Lett.*, vol. 21, no. 2, pp. 391–395, 2022.

[J14] **S. Sharma** and P. Triverio, "AIMx: An Extended Adaptive Integral Method for the Fast Electromagnetic Modeling of Complex Structures," *IEEE Trans. Antennas Propag.*, vol. 69, no. 12, pp. 8603–8617, 2021.

[J15] Z. Zainib, F. Ballarin, S. Fremes, P. Triverio, L. Jimenez-Juan, and G. Rozza, "Reduced order methods for parametric optimal flow control in coronary bypass grafts, towards patient-specific data assimilation," *Int. J. Numer. Method. Biomed. Eng.*, vol. 37, no. 12, p. e3367, 2021, (**top cited article 2020-21, 2021-22**).

[J16] **E. Fevola**, F. Ballarin, L. Jimenez-Juan, S. Fremes, S. Grivet-Talocia, G. Rozza, and P. Triverio, "An Optimal Control Approach to Determine Resistance-Type Boundary Conditions from in-vivo Data for Cardiovascular Simulations," *Int. J. Numer. Method. Biomed. Eng.*, vol. 37, no. 10, 2021, (**top cited articles 2021**).

[J17] **S. Sharma** and P. Triverio, "An Accelerated Surface Integral Equation Method for the Electromagnetic Modeling of Dielectric and Lossy Objects of Arbitrary Conductivity," *IEEE Trans. Antennas Propag.*, vol. 69, no. 9, pp. 5822–5836, 2021.

[J18] **S. Sharma** and P. Triverio, "A Single-Layer Dual-Mesh Boundary Element Method for Multiscale Electromagnetic Modeling of Penetrable Objects in Layered Media," *IEEE J. Multiscale and Multiphys. Comput. Techn.*, vol. 6, pp. 158–170, 2021, (featured in paper highlights, Jan 2022).

[J19] **S. Sharma** and P. Triverio, "SLIM: A Well-Conditioned Single-Source Boundary Element Method for Modeling Lossy Conductors in Layered Media," *IEEE Antennas Wireless Propag. Lett.*, vol. 19, no. 12, pp. 2072–2076, 2020, (**2021 Piergiorgio L. E. Uslenghi Letters Prize Paper Award, selected among about 500 manuscripts published in 2020**).

[J20] **U. R. Patel**, P. Triverio, and S. V. Hum, "A Fast Macromodeling Approach to Efficiently Simulate Inhomogeneous Electromagnetic Surfaces," *IEEE Trans. Antennas Propag.*, vol. 68, no. 11, pp. 7480 – 7493, 2020.

[J21] **F. Bekmambetova** and **X. Zhang** and P. Triverio, "A Dissipation Theory for Three-Dimensional FDTD with Application to Stability Analysis and Subgridding," *IEEE Trans. Antennas Propag.*, vol. 66, no. 12, pp. 7156–7170, 2018.

[J22] **U. R. Patel** and P. Triverio and S. V. Hum, "A Macromodeling Approach to Efficiently Compute Scattering from Large Arrays of Complex Scatterers," *IEEE Trans. Antennas Propag.*, vol. 66, no. 11, pp. 6158–6169, 2018.

[J23] **X. Zhang** and **F. Bekmambetova** and P. Triverio, "A Stable FDTD Method with Embedded Reduced-Order Models," *IEEE Trans. Antennas Propag.*, vol. 66, no. 2, pp. 827–837, 2018.

[J24] **U. R. Patel** and P. Triverio and S. V. Hum, "A Novel Single-Source Surface Integral Method to Compute Scattering from Dielectric Objects," *IEEE Antennas Wireless Propag. Lett.*, vol. 16, no. 1, pp. 1536–1225, 2017.

[J25] **F. Bekmambetova** and **X. Zhang** and P. Triverio, "A Dissipative Systems Theory for FDTD with Application to Stability Analysis and Subgridding," *IEEE Trans. Antennas Propag.*, vol. 65, no. 2, pp. 751–762, 2017.

[J26] **U. R. Patel** and P. Triverio, "Skin Effect Modeling in Conductors of Arbitrary Shape Through a Surface Admittance Operator and the Contour Integral Method," *IEEE Trans. Microw. Theory Techn.*, vol. 64, no. 9, pp. 2708–2717, 2016.

[J27] Bjorn Gustavsen, Martin Hoyer-Hansen, **U. R. Patel** and P. Triverio, "Inclusion of Wire Twisting Effects in Cable Impedance Calculations," *IEEE Trans. Power Del.*, vol. 31, no. 6, pp. 2520–2529, 2016.

[J28] **D. Oyaro** and P. Triverio, "TurboMOR-RC: an Efficient Model Order Reduction Technique for RC Networks with Many Ports," *IEEE Trans. Comput.-Aided Design Integr. Circuits Syst.*, vol. 35, no. 10, pp. 1695–1706, 2016.

[J29] **U. R. Patel** and P. Triverio, "Accurate Impedance Calculation for Underground and Submarine Power Cables using MoM-SO and a Multilayer Ground Model," *IEEE Trans. Power Del.*, vol. 31, no. 3, pp. 1233–1241, 2016.

[J30] **U. R. Patel** and P. Triverio, "MoM-SO: a Complete Method for Computing the Impedance of Cable Systems Including Skin, Proximity, and Ground Return Effects ," *IEEE Trans. Power Del.*, vol. 30, no. 5, pp. 2110–2118, 2015.

[J31] **X. Li** and C. D. Sarris and P. Triverio, "Structure-Preserving Reduction of Finite-Difference Time-Domain Equations with Controllable Stability Beyond the CFL Limit," *IEEE Trans. Microw. Theory Techn.*, vol. 62, no. 12, pp. 3228–3238, 2014.

[J32] **U. R. Patel**, B. Gustavsen, and P. Triverio, "Proximity-Aware Calculation of Cable Series Impedance for Systems of Solid and Hollow Conductors," *IEEE Trans. Power Del.*, vol. 29, no. 5, pp. 2101–2109, 2014.

[J33] P. Triverio, "Robust Causality Check for Sampled Scattering Parameters via a Filtered Fourier Transform," *IEEE Microw. Wireless Compon. Lett.*, vol. 24, no. 2, pp. 72–74, 2014.

[J34] **U. R. Patel**, B. Gustavsen, and P. Triverio, "An Equivalent Surface Current Approach for the Computation of the Series Impedance of Power Cables with Inclusion of Skin and Proximity Effects," *IEEE Trans. Power Del.*, vol. 28, no. 4, pp. 2474–2482, 2013.

[J35] A. Chinea, S. Grivet-Talocia, **H. Hu**, P. Triverio, D. Kaller, C. Siviero, M. Kindscher, "Signal integrity verification of multi-chip links using passive channel macromodels," *IEEE Trans. Compon., Packag., Manuf. Technol.*, vol. 1, no. 6, pp. 920–933, 2011.

[J36] A. Chinea, P. Triverio, S. Grivet-Talocia, "Delay-based macromodeling of long interconnects from frequency-domain terminal responses," *IEEE Trans. Adv. Packag.*, vol. 33, no. 1, pp. 246–256, 2010.

[J37] P. Triverio, S. Grivet-Talocia, A. Chinea, "Identification of highly efficient delay-rational macromodels of long interconnects from tabulated frequency data," *IEEE Trans. Microw. Theory Techn.*, vol. 58, no. 3, pp. 566–577, 2010.

[J38] P. Triverio, S. Grivet-Talocia, M. Bandinu, F. Canavero, "Geometrically-parameterized circuit models of printed circuit board traces inclusive of antenna coupling," *IEEE Trans. Electromagn. Compat.*, vol. 52, pp. 471–478, 2010.

[J39] P. Triverio, S. Grivet-Talocia, M. S. Nakhla, "A parameterized macromodeling strategy with uniform stability test," *IEEE Trans. Adv. Packag.*, vol. 32, no. 1, pp. 205–215, 2009.

[J40] P. Triverio and S. Grivet-Talocia, "Robust Causality Characterization via Generalized Dispersion Relations," *IEEE Trans. Adv. Packag.*, vol. 31, no. 3, pp. 579–593, 2008.

[J41] P. Triverio, S. Grivet-Talocia, M. S. Nakhla, F. Canavero, R. Achar, "Stability, causality, and passivity in electrical interconnect models," *IEEE Trans. Adv. Packag.*, vol. 30, no. 4, pp. 795–808, 2007, (**2007 Best Paper Award**).

Refereed Conferences and Workshops (published or definitively accepted)

[C1] **Y. Li** and P. Triverio, "On the Parallelization of the MultiAIM Algorithm for the Fast Electromagnetic Analysis of 3D ICs," in *33rd IEEE Conference on Electrical Performance of Electronic Packaging and Systems*, Toronto, Canada, Oct. 6-9 2024.

[C2] **D. Marek**, **J. Hatton**, **Y. Li** and P. Triverio, "A Highly-Scalable Parallel Boundary Element Method for the Full-Wave Electromagnetic Analysis of Large Interconnect Networks and Entire Packages," in *33rd IEEE Conference on Electrical Performance of Electronic Packaging and Systems*, Toronto, Canada, Oct. 6-9 2024, (**Best Paper Award, Best Benchmark Paper Award**).

[C3] **Y. Li D. Marek** and P. Triverio, "Fast Scattering Analysis of Multiscale Structures in Layered Media using MultiAIM," in *2024 IEEE International Symposium on Antennas and Propagation and ITNC-USNC-URSI Radio Science Meeting*, Florence, Italy, Jul 14-19 2024, (**TICRA Travel Grant**).

[C4] **N. Tran-Nguyen**, A. Yan, S. Fremes, L. Jimenez-Juan, and P. Triverio, "Comparison between vessel wall models to estimate hemodynamics in coronary artery bypass graft patients," in *Summer Biomechanics, Bioengineering, and Biotransport Conference (SB3C)*, Lake Geneva, WI, June 11–14 2024.

[C5] **Y. Li D. Marek** and P. Triverio, "Fast Electromagnetic Analysis of Multiscale Interconnect Networks using MultiAIM," in *32nd IEEE Conference on Electrical Performance of Electronic Packaging and Systems*, Milpitas, CA, Oct. 15 - 18 2023, (**Best Benchmark Paper Award**).

[C6] **F. Bekmambetova**, and P. Triverio, "A Framework for Creating Stable FDTD Schemes for the Schrodinger Equation that Conserve Probability and Energy," in *IEEE International Symposium on Antennas and Propagation and USNC-URSI Radio Science Meeting*, Portland, OR, July 23–28 2023.

[C7] **D. Marek** and P. Triverio, "On the Large-Scale Parallel Scalability of Advanced EFIE Formulations Suitable for Multiscale Structures," in *IEEE International Symposium on Antennas and Propagation and USNC-URSI Radio Science Meeting*, Portland, OR, July 23–28 2023, (**Honorable Mention**).

[C8] **Y. Li D. Marek** and P. Triverio, "A Multigrid Algorithm with Scaled Stencils for the Fast Scattering Analysis of Multiscale Structures," in *IEEE International Symposium on Antennas and Propagation and USNC-URSI Radio Science Meeting*, Portland, OR, July 23–28 2023.

[C9] **S. Sharma** and P. Triverio, "A Potential-Based Surface Operator for Modeling Lossy Conductors from DC to High Frequencies," in *17th European Conference on Antennas and Propagation (EuCAP)*, Florence, Italy, March 26 - 31 2023.

[C10] **Q. Zhang**, **R. Xie**, F. Guo, **S. Sharma**, **D. Marek**, and P. Triverio, "An Efficient Methodology to Parse and Mesh Large Interconnect Layouts for Electromagnetic Analysis," in *31st IEEE Conference on Electrical Performance of Electronic Packaging and Systems*, San Jose, Oct. 9 - 12 2022, (**Best Benchmark Paper Award**).

[C11] **D. Marek** and P. Triverio, "An Efficient Parallel Electromagnetic Solver for Extracting Scattering Parameters from Large Electrical Interconnects With Many Ports," in *31st*

IEEE Conference on Electrical Performance of Electronic Packaging and Systems, San Jose, Oct. 9 - 12 2022.

[C12] **S. Sharma**, and P. Triverio, "A Preconditioned Potential-Based Surface Integral Method for Modeling Lossy Conductors From DC to High Frequencies," in *IEEE International Symposium on Antennas and Propagation and USNC-URSI Radio Science Meeting*, Denver, CO, July 10–15 2022.

[C13] **Y. Fu**, M. Najafi, S. Fremes, L. Jimenez-Juan, D. A. Steinman, P. Triverio, "A Preliminary Study on the Performance of Regular vs High-Fidelity FEM Algorithms in Predicting Complex Aortic Flow Patterns ," in *9th World Congress of Biomechanics*, Taipei, Taiwan, July 10 - 14 2022.

[C14] **N. Tran-Nguyen**, A. Yan, S. Fremes, P. Triverio, and L. Jimenez-Juan, "Image-Guided Computational Fluid Dynamics Reveals Correlation Between Low Wall Shear Stress And Coronary Artery Bypass Graft Remodeling One Year After Surgery," in *9th World Congress of Biomechanics*, Taipei, Taiwan, July 10 - 14 2022.

[C15] **E. Fevola**, and T. Bradde, and P. Triverio, and S. Grivet-Talocia, "Automated Estimation of Lumped Boundary Conditions for 1D Circulation Models: a Vector Fitting Approach," in *9th World Congress of Biomechanics*, Taipei, Taiwan, July 10 - 14 2022, (oral presentation).

[C16] **D. Marek**, and **S. Sharma**, and P. Triverio, "An Efficient Strategy for Distributing the Mesh of Parallel Electromagnetic Solvers Based on the AIM," in *16th European Conference on Antennas and Propagation (EuCAP)*, Madrid, Spain, March 27 - April 1 2022.

[C17] **S. Sharma**, and P. Triverio, "A Broadband Potential-Based Boundary Element Method for Modeling Electromagnetic Scattering from Dielectrics and Conductors," in *16th European Conference on Antennas and Propagation (EuCAP)*, Madrid, Spain, March 27 - April 1 2022, (**Best Student Paper Award**).

[C18] **S. Sharma** and P. Triverio, "A Fast Surface Integral Method for the Wideband Frequency Analysis of Interconnect Networks," in *30th IEEE Conference on Electrical Performance of Electronic Packaging and Systems*, Online, Oct. 17 - 20 2021.

[C19] **R. Gholami**, P. Naseri, P. Triverio, and S. V. Hum, "A New Domain Decomposition Technique for Full-wave Analysis of Inhomogeneous Electromagnetic Surfaces with Connected Conductors," in *IEEE AP-S Symposium on Antennas and Propagation and CNC/USNC-URSI Joint Meeting*, Marina Bay Sands, Singapore, December 4 - 10 2021.

[C20] **D. Marek** and P. Triverio, "Improving the Efficiency of Parallel FFTs in Parallel Electromagnetic Solvers Based on the AIM," in *IEEE AP-S Symposium on Antennas and Propagation and CNC/USNC-URSI Joint Meeting*, Marina Bay Sands, Singapore, December 4 - 10 2021, (**Honorable Mention**).

[C21] **S. Sharma** and P. Triverio, "Strata: An Open-Source C++ Library for Computing Green's Functions for Layered Media," in *IEEE AP-S Symposium on Antennas and Propagation and CNC/USNC-URSI Joint Meeting*, Marina Bay Sands, Singapore, December 4 - 10 2021.

[C22] **F. Bekmambetova** and P. Triverio, "A Dissipation Theory for Creating New Stable FDTD Algorithms with Potentials," in *IEEE AP-S Symposium on Antennas and Propagation and CNC/USNC-URSI Joint Meeting*, Marina Bay Sands, Singapore, December 4 - 10 2021.

[C23] **N. Tran-Nguyen**, **F. Condemi**, S. Fremes, P. Triverio, L. Jimenez-Juan, "On the relation between computational fluid dynamics-derived biomarkers and coronary artery bypass graft remodeling," in *Summer Biomechanics, Bioengineering and Biotransport Conference (SB3C 2021)*, June 14 - 18 2021, (**Finalist, Student Paper Competition**).

[C24] **Y. Fu**, M. Najafi, S. Fremes, L. Jimenez-Juan, D. A. Steinman, P. Triverio, "A comparative study of regular- and high-fidelity finite element algorithms for the prediction of aortic flows," in *Summer Biomechanics, Bioengineering and Biotransport Conference (SB3C 2021)*, June 14 - 18 2021, (**Finalist, Student Paper Competition**).

[C25] **E. Fevola**, F. Ballarin, L. Jimenez-Juan, S. Fremes, P. Triverio, S. Grivet-Talocia, G. Rozza, "Automated estimation of patient-specific boundary conditions for cardiovascular simulations: an optimal control approach," in *Summer Biomechanics, Bioengineering and Biotransport Conference (SB3C 2021)*, June 14 - 18 2021.

[C26] **S. Sharma**, and P. Triverio, "Fast Modeling of Electromagnetic Scattering from Dielectrics or Conductors with an Extended Adaptive Integral Method," in *15th European Conference on Antennas and Propagation (EuCAP)*, Dusseldorf, Germany, March 22-26 2021, (**TICRA-EurAAP Grant winner**).

[C27] **D. Marek**, **S. Sharma**, and P. Triverio, "An Efficient and Parallel Electromagnetic Solver for Complex Interconnects in Layered Media," in *29th IEEE Conference on Electrical Performance of Electronic Packaging and Systems*, San Jose, CA, Oct. 4 - 7 2020.

[C28] **S. Sharma** and P. Triverio, "Accelerated Boundary Element Modeling of Lossy Conductors in Layered Media with a Single-Source Surface Impedance Operator," in *29th IEEE Conference on Electrical Performance of Electronic Packaging and Systems*, San Jose, CA, Oct. 4 - 7 2020.

[C29] **S. Sharma** and P. Triverio, "A Single-Source Surface Impedance Formulation for Modeling Arbitrary Penetrable Media," in *IEEE AP-S Symposium on Antennas and Propagation and CNC/USNC-URSI Joint Meeting*, Montreal, July 5-10 2020, (**Honorable Mention**).

[C30] **S. Sharma** and P. Triverio, "A Unified Fully-Accelerated Surface Integral Formulation for Efficient Modeling of Penetrable Media," in *IEEE AP-S Symposium on Antennas*

and Propagation and CNC/USNC-URSI Joint Meeting, Montreal, July 5-10 2020, (**2nd Prize, Student Paper Contest**).

[C31] **D. Marek**, **S. Sharma**, and P. Triverio, "An Efficient Parallelization Strategy for the Adaptive Integral Method Based on Graph Partitioning," in *14th European Conference on Antennas and Propagation (EuCAP)*, Copenhagen, Denmark, March 15-20 2020.

[C32] **F. Condemi**, S. Fremes, P. Triverio, and L. Jimenez-Juan, "Comparison of post-surgical wall shear stress values in arterial and venous coronary grafts using computational fluid dynamics guided by CCTA and 4D flow MR imaging," in *105th Scientific Assembly, Radiological Society of North America*, Chicago, IL, Dec. 1-6 2019.

[C33] **S. Sharma**, and P. Triverio, "Efficient Electromagnetic Modeling of On-Chip Interconnects with a Hybrid 2D-3D Differential Surface Admittance Approach," in *IEEE International Conference on Electromagnetics in Advanced Applications (ICEAA)*, Granada, Spain, September 9-13 2019.

[C34] **F. Bekmambetova** and P. Triverio, "On the Extension of the TurboMOR-RC Reduction Method to RLC Circuits," in *23rd IEEE Workshop on Signal and Power Integrity*, Grenoble, France, June 18-21 2019.

[C35] **S. Sharma**, and P. Triverio, "A Well-Conditioned Differential Surface Admittance Formulation for Modeling Penetrable Media," in *2019 IEEE AP-S Symposium on Antennas and Propagation*, Atlanta, GA, July 7-12 2019, (**Honorable Mention**).

[C36] **X. Zhang**, and P. Triverio, "A Stable 3-D FDTD Method with Multiple Embedded Reduced-Order Models," in *2019 IEEE AP-S Symposium on Antennas and Propagation*, Atlanta, GA, July 7-12 2019.

[C37] **U. R. Patel**, and P. Triverio, and S. V. Hum, "A Fast Macromodeling Approach to Simulate Complex Electromagnetic Surfaces," in *2019 IEEE AP-S Symposium on Antennas and Propagation*, Atlanta, GA, July 7-12 2019, (**Honorable Mention**).

[C38] **F. Condemi**, S. Fremes, P. Triverio, and L. Jimenez-Juan, "On the use of 4D flow MRI to create patient-specific computational fluid dynamics models for patients with coronary artery bypass surgery," in *22nd Annual Scientific Sessions, Society for Cardiovascular Magnetic Resonance*, Bellevue, WA, Feb. 6 - 9 2019.

[C39] **S. Sharma**, **U. Patel**, and P. Triverio, "Accelerated Electromagnetic Analysis of Interconnects in Layered Media using a Near-Field Series Expansion of the Green's Function," in *27th IEEE Conference on Electrical Performance of Electronic Packaging and Systems*, San Jose, CA, Oct. 14 - 17 2018, (**Finalist for Best Student Paper Award**).

[C40] **S. Sharma**, and P. Triverio, "A Fast and Broadband Surface Method for Skin Effect Modeling in Multiscale Lossy Conductors," in *2018 IEEE AP-S Symposium on Antennas and Propagation*, Boston, MA, July 8-13 2018.

[C41] **U. R. Patel**, P. Triverio, and S. V. Hum, "A Rigorous Macromodeling Approach to Efficiently Simulate Large Arrays of Complex Scatterers," in *2018 IEEE AP-S Symposium on Antennas and Propagation*, Boston, MA, July 8-13 2018.

[C42] **F. Bekmambetova**, **X. Zhang**, and P. Triverio, "Acceleration of Shielding Effectiveness Analysis Using Stable FDTD Subgridding," in *26th IEEE Conference on Electrical Performance of Electronic Packaging and Systems*, San Jose, CA, Oct. 15 - 18 2017.

[C43] **U. R. Patel**, **S. Sharma**, **S. Yang**, S. V. Hum, and P. Triverio, "Full-Wave Electromagnetic Characterization of 3D Interconnects Using a Surface Integral Formulation," in *26th IEEE Conference on Electrical Performance of Electronic Packaging and Systems*, San Jose, CA, Oct. 15 - 18 2017, (**Best Paper Award**).

[C44] **U. R. Patel**, P. Triverio, and S. V. Hum, "A Single-Source Surface Integral Equation Formulation for Composite Dielectric Objects," in *2017 IEEE AP-S Symposium on Antennas and Propagation*, San Diego, CA, July 9-14 2017, (**Honorable Mention**).

[C45] **F. Bekmambetova**, and P. Triverio, "A Dissipation Theory for 3-D FDTD with Application to Stable Subgridding," in *2017 IEEE AP-S Symposium on Antennas and Propagation*, San Diego, CA, July 9-14 2017.

[C46] **X. Zhang**, and P. Triverio, "Reduced-Order Modeling in FDTD Subgridding with Complexity Independent of the Grid Refinement Ratio," in *2017 IEEE AP-S Symposium on Antennas and Propagation*, San Diego, CA, July 9-14 2017.

[C47] **U. R. Patel**, S. V. Hum, and P. Triverio, "A Magneto-Quasi-Static Surface Formulation to Calculate the Impedance of 3D Interconnects with Arbitrary Cross-section," in *21st IEEE Workshop on Signal and Power Integrity*, Baveno, Italy, May 7-10 2017, (**Best Student Paper Award**).

[C48] **Z. Chen**, F. Ballarin, G. Rozza, A. M. Crean, L. Jimenez-Juan, and P. Triverio, "Non-invasive assessment of aortic coarctation severity using computational fluid dynamics: a feasibility study," in *20th Annual Scientific Sessions, Society for Cardiovascular Magnetic Resonance*, Washington, DC, Feb. 1-4 2017.

[C49] **X. Zhang** and **F. Bekmambetova** and P. Triverio, "Reduced Order Modeling in FDTD with Provable Stability beyond the CFL Limit," in *25th IEEE Conference on Electrical Performance of Electronic Packaging and Systems*, San Diego, CA, Oct. 23-26 2016.

[C50] **F. Bekmambetova** and **X. Zhang** and P. Triverio, "A Passivity Approach to FDTD Stability with Application to Interconnect Modeling," in *25th IEEE Conference on Electrical Performance of Electronic Packaging and Systems*, San Diego, CA, Oct. 23-26 2016, (**Best Student Paper Award**).

[C51] **U. R. Patel**, S. V. Hum and P. Triverio, "Fast Parameter Extraction for Transmission Lines with Arbitrarily-Shaped Conductors and Dielectrics Using the Contour Integral

Method," in *25th IEEE Conference on Electrical Performance of Electronic Packaging and Systems*, San Diego, CA, Oct. 23-26 2016, (**Finalist for Best Student Paper Award**).

[C52] **J. B. Preibisch**, P. Triverio, and C. Schuster, "Design Space Exploration for Printed Circuit Board Vias Using Polynomial Chaos Expansion," in *2016 IEEE Intl. Conf. on Signal and Power Integrity*, Ottawa, Canada, July 25 - 29 2016.

[C53] **U. R. Patel**, and P. Triverio, "A Fast Surface Method to Model Skin Effect in Transmission Lines with Conductors of Arbitrary Shape or Rough Profile," in *2016 IEEE Intl. Conf. on Signal and Power Integrity*, Ottawa, Canada, July 25-29 2016, (**Finalist for Best Student Paper Award**).

[C54] **X. Zhang**, **F. Bekmambetova**, and P. Triverio, "A Dissipative Control Approach to Ensure Stability in Advanced FDTD Schemes," in *2016 USNC-URSI National Radio Science meeting*, Fajardo, Puerto Rico, June 26 - July 1 2016.

[C55] **F. Bekmambetova**, **X. Zhang**, and P. Triverio, "Accelerating Electromagnetic Simulations with Human Models through FDTD Subgridding and CFL Limit Extension," in *2016 USNC-URSI National Radio Science meeting*, Fajardo, Puerto Rico, June 26 - July 1 2016.

[C56] **U. R. Patel**, P. Triverio, and S. V. Hum, "Analysis of Radiating Microstrip Structures Using the Contour Integral Method," in *2016 IEEE International Symposium on Antennas and Propagation*, Fajardo, Puerto Rico, June 26 - July 1 2016.

[C57] **D. Oyaro** and P. Triverio, "Fast Model Order Reduction of RC Networks with Very Large Order and Port Count," in *24th IEEE Conference on Electrical Performance of Electronic Packaging and Systems*, San Jose, CA, Oct. 25-28 2015.

[C58] **X. Li**, and P. Triverio, "Stable FDTD Simulations with Subgridding at the Time Step of the Coarse Grid: a Model Order Reduction Approach," in *IEEE MTT-S Int. Conf. on Numerical Electromagnetic and Multiphysics Modeling and Optimization*, Ottawa, Canada, August 11-14 2015.

[C59] **J. B. Preibisch**, P. Triverio, and C. Schuster, "Efficient Stochastic Transmission Line Modeling Using Polynomial Chaos Expansion with Multiple Variables," in *IEEE MTT-S Int. Conf. on Numerical Electromagnetic and Multiphysics Modeling and Optimization*, Ottawa, Canada, August 11-14 2015, (**3rd Student Paper Prize**).

[C60] **X. Li**, and P. Triverio, "Accelerating Multiscale Finite-Difference Time-Domain Simulations through Model Order Reduction and CFL Limit Extension," in *IEEE AP-S Symposium on Antennas and Propagation and URSI CNC/USNC Joint Meeting*, July 19-24 2015.

[C61] **U. R. Patel**, and P. Triverio, "A Comprehensive study on the Influence of Proximity Effects on Electromagnetic Transients in Power Cables," in *International Conference on Power Systems Transients*, Dubrovnik, Croatia, June 15-18 2015.

[C62] **J. B. Preibisch**, P. Triverio, and C. Schuster, "Sensitivity Analysis of Vias Impedance using Polynomial Chaos Expansion," in *19th IEEE Workshop on Signal and Power Integrity*, Berlin, Germany, May 10-13 2015.

[C63] P. Triverio, "An Accurate, Robust and Intuitive Technique to Detect Causality Violations in Broadband Frequency Measurements," in *2014 IEEE International Conference on Signal and Power Integrity (SIPI 2014)*, Raleigh, NC, August 3-8 2014, (**Finalist for Best SI/PI Paper Award**).

[C64] **X. Li**, Costas D. Sarris, and P. Triverio, "Stability Preserving Model Order Reduction of FDTD with Stability Enforcement Beyond the CFL Limit," in *2014 IEEE International Symposium on Antennas and Propagation*, Memphis, Tennessee, USA, July 6-12 2014.

[C65] **X. Li**, Costas D. Sarris, and P. Triverio, "Overcoming the FDTD Stability Limit via Model Order Reduction and Eigenvalue Perturbation," in *IEEE International Microwave Symposium (IMS 2014)*, Tampa Bay, FL, June 1-6 2014.

[C66] P. Triverio, "Reliable Detection of Causality Violations in Tabulated Scattering Parameters through Filtered Dispersion Relations," in *22nd Conference on Electrical Performance of Electronic Packaging and Systems (EPEPS 2013)*, San Jose, CA, Oct. 27-30 2013.

[C67] **U. R. Patel**, B. Gustavsen, and P. Triverio, "Application of the MoM-SO Method for Accurate Impedance Calculation of Single-Core Cables Enclosed by a Conducting Pipe," in *10th International Conference on Power Systems Transients (IPST 2013)*, Vancouver, Canada, July 18-20 2013.

[C68] **U. R. Patel**, B. Gustavsen, and P. Triverio, "MoM-SO: a Fast and Fully-Automated Method for Resistance and Inductance Computation in High-Speed Cable," in *17th IEEE workshop on Signal and Power Integrity*, Paris, France, May 12-15 2013.

[C69] S. Grivet-Talocia, **S. B. Olivadese**, P. Triverio, "A compression strategy for rational macromodeling of large interconnect structures," in *IEEE 20th Conference on Electrical Performance of Electronic Packaging and Systems (EPEPS)*, Oct. 2011, pp. 53–56.

[C70] P. Triverio, M. Nakhla, S. Grivet-Talocia, "Extraction of parametric circuit models from scattering parameters of passive RF components," in *Proc. of the 5th European Microwave Integrated Circuits Conference*, Paris, September 27 - 28 2010, pp. 393 – 396, (**Young Engineer Prize**).

[C71] P. Triverio, M. Nakhla, S. Grivet-Talocia, "Passive parametric modeling of interconnects and packaging components from sampled impedance, admittance or scattering data," in *Electronics System Integration Technology Conferences (ESTC)*, Berlin, Germany, September 13-16 2010.

[C72] A. Chinea, P. Triverio, S. Grivet-Talocia, "Passive delay-based macromodels for signal integrity verification of multi-chip links," in *Proc. of the 14th IEEE Workshop on Signal Propagation on Interconnects, Hildesheim (Germany)*, May 2010, pp. 113–116.

[C73] P. Triverio, M. Nakhla, S. Grivet-Talocia, "Passive parametric macromodeling from sampled frequency data," in *Proc. of the 14th IEEE Workshop on Signal Propagation on Interconnects, Hildesheim (Germany)*, May 2010, pp. 117–119.

[C74] A. Chinea, S. Grivet-Talocia, P. Triverio, "On the performance of weighting schemes for passivity enforcement of delayed rational macromodels of long interconnects," in *Proc. of the 18th Conference on Electrical Performance of Electronic Packaging and Systems Portland (Tigard), Oregon*, October 19-21 2009.

[C75] P. Triverio, S. Grivet-Talocia, A. Chinea, "Black-box identification of delay-based macromodels from measured terminal responses," in *Proc. of the 13th IEEE Workshop on Signal Propagation on Interconnects, Strasbourg (France)*, May 12-15 2009, pp. 1–4.

[C76] P. Triverio, S. Grivet-Talocia, M.S. Nakhla, "On the construction of uniformly stable multivariate interconnect macromodels," in *Proc. of the 13th IEEE Workshop on Signal Propagation on Interconnects, Strasbourg (France)*, May 12-15 2009, pp. 1–4.

[C77] A. Chinea, P. Triverio, S. Grivet-Talocia, "Compact macromodeling of electrically long interconnects," in *Proc. of the 17th Topical Meeting on Electrical Performance of Electronic Packaging (EPEP 2008)*, 2008, (**Best Paper Award**).

[C78] P. Triverio, S. Grivet-Talocia and M. Nakhla, "An improved fitting algorithm for parametric macromodeling from tabulated data," in *12th Workshop on Signal Propagation on Interconnects (SPI 2008), Avignon, France*, May 12-15, 2008.

[C79] P. Triverio, M. Nakhla and S. Grivet-Talocia, "Parametric macromodeling of multiport networks from tabulated data," in *16th Topical Meeting on Electrical Performance of Electronic Packaging (EPEP 2007), Atlanta, GE*, Oct. 29-31, 2007.

[C80] P. Triverio and S. Grivet-Talocia, "Causality-constrained interpolation of tabulated frequency responses," in *15th Topical Meeting on Electrical Performance of Electronic Packaging (EPEP 2006), Scottsdale, AZ*, Oct. 23-25, 2006, pp. 181–184, (**Best Student Paper Award**).

[C81] P. Triverio and S. Grivet-Talocia, "On checking causality of bandlimited sampled frequency responses," in *2nd Conference on Ph.D. Research in Microelectronics and Electronics (PRIME), Otranto (LE), Italy*, June 12-15, 2006, pp. 501–504.

[C82] P. Triverio and S. Grivet-Talocia, "A robust causality verification tool for tabulated frequency data," in *10th IEEE Workshop on Signal Propagation on Interconnects, Berlin, Germany*, May 9-12, 2006.

Non-Referred Conferences and Workshops

[NC1] **F. Condemi** and S. Fremes and P. Triverio and L. Jimenez-Juan, "Towards an Early Detection of Coronary Artery Bypass Graft Failure: A Computational Fluid Dynamics

Approach Based on CT and 4D-Flow MRI," in *Annual XSeed and EMHSeed Poster Session*, Toronto, ON, June 27 2019.

[NC2] **S. Sharma**, **U. Patel**, and P. Triverio, "An accelerated solver for Maxwell's equations in integral form with application to integrated circuit design," in *36th Southern Ontario Numerical Analysis Day (SONAD)*, Toronto, ON, May 4 2018.

[NC3] Z. Zainib, **Z. Chen**, F. Ballarin, P. Triverio, L. Jimenez-Juan, A. Crean, and G. Rozza, "Data Assimilation for Cardiovascular Modeling with Applications to Optimal Flow Control," in *QUIET 2017 - Quantification of Uncertainty: Improving Efficiency and Technology*, Trieste, Italy, July 18-21 2017.

[NC4] F. Ballarin, L. Jimenez-Juan, P. Triverio, A. Crean, and G. Rozza, "A reduced-order modelling framework for cardiovascular flows and a representative clinical application to patient-specific aortic coarctation disease," in *SIAM Conference on Uncertainty Quantification*, Lausanne, Switzerland, April 5-8 2016.

[NC5] **X. Chang**, **T. Zhou**, **C. Mao**, A. Crean, L. Jimenez-Juan, P. Triverio, "A Non-Invasive Computational Approach to Assess the Severity of Aortic Coarctation," in *Catapult Innovation Event*, Toronto, Canada, April 27 2016.

Invention disclosures

[ID1] P. Triverio, **U. R. Patel**, "Mom-so: a fast and accurate algorithm to compute the impedance of power cables including for skin, proximity, and ground effects," 2015, (licensed twice to industry).

[ID2] P. Triverio, **U. R. Patel**, "A fast and accurate technique to compute the series impedance of complex power cables with inclusion of skin and proximity effects," 2013, (licensed twice to industry).

Scholarly addresses

Scholarly addresses

[SA1] P. Triverio, "Emerging challenges and developments in the electromagnetic modeling of 3D integrated circuits and metasurface antennas," Ansys, (online), October 26 2023.

[SA2] P. Triverio, "Emerging challenges and developments in the electromagnetic modeling of 3D integrated circuits and metasurface antennas," Carleton University and IEEE Ottawa Chapters, August 29 2023.

[SA3] P. Triverio, "Emerging challenges and developments in the electromagnetic modeling of 3D integrated circuits and metasurface antennas," XXXVII Riunione Annuale dei Ricercatori di Elettrotecnica (ET2023), Iseo, Italy, June 29-30 2023, **(invited keynote)**.

[SA4] P. Triverio, "Emerging challenges and developments in the electromagnetic modeling of 3D integrated circuits and metasurface antennas," Politecnico di Milano, Italy, June 28 2023.

[SA5] P. Triverio, "Emerging challenges and developments in the electromagnetic modeling of 3D integrated circuits and metasurface antennas," University of Trento, Italy, June 27 2023.

[SA6] P. Triverio and **S. Sharma**, "Integral equation methods for the electromagnetic analysis of interconnect networks: state of the art and open challenges," IEEE Conference on Electrical Performance of Electronic Packages and Systems, San Jose, CA, October 9-12 2022, (invited tutorial).

[SA7] **S. Sharma** and P. Triverio, "Integral Equation Methods for the Electromagnetic Analysis of Interconnect Networks: State of Art and Recent Advancements," IEEE Electrical Design of Advanced Packaging and Systems (EDAPS) Symposium, Virtual, December 13-15 2021.

[SA8] P. Triverio, "A macromodeling approach to accelerate multiscale EM simulations, with application to metasurface antennas, 3D ICs and power cables," Massachusetts Institute of Technology (MIT), Cambridge, MA, May 8 2019.

[SA9] P. Triverio, "A macromodeling approach to accelerate multiscale EM simulations, with application to metasurface antennas, 3D ICs and power cables," École Polytechnique Fédérale, Lausanne, Switzerland, Nov 22 2018.

[SA10] P. Triverio, "A macromodeling approach to accelerate multiscale EM simulations, with application to metasurface antennas, 3D ICs and power cables," IBM Research, Zurich, Switzerland, Nov 21 2018.

[SA11] P. Triverio, "Accelerating Multiscale FDTD Simulations with Model Order Reduction," University of Applied Sciences Rapperswil, Rapperswil, Switzerland, Nov 20 2018.

[SA12] P. Triverio and L. Jimenez Juan, "Computer simulations: from designing integrated circuits to understanding the human heart," Skule Lunch & Learn, University of Toronto, Nov 14 2018.

[SA13] **U. R. Patel** and P. Triverio, "Integral Equation Methods for the Electromagnetic Analysis of Interconnect Networks: State of Art and Recent Advancements," 27th IEEE Conference on Electrical Performance of Electronic Packaging and Systems, Oct 14 2018, (invited tutorial).

[SA14] P. Triverio, "Fast Electromagnetic Analysis of 3D Interconnects Using a Surface Integral Formulation," 2018 Central PA Signal Integrity Symposium, Penn State Harrisburg, Apr 13 2018, (invited).

[SA15] P. Triverio, "A Dissipation Theory for FDTD With Application to the Stable Model Order Reduction of FDTD Equations," University of Toronto, Feb 2 2018.

[SA16] L. Jimenez Juan and P. Triverio, "Coronary artery bypass surgery: can radiologists and engineers together bypass failure?" Medical Imaging for Engineers Workshop, Toronto, August 17 2017.

[SA17] P. Triverio, "A Dissipation Theory for FDTD With Application to Stable Subgridding and Stable Model Order Reduction of FDTD Equations," Politecnico di Torino, Italy, June 15 2017.

[SA18] P. Triverio, "What computational engineering can do for industry and society?" IEEE Student Chapter, University of Toronto, November 17 2016.

[SA19] P. Triverio, "Full-wave Advanced Electromagnetic Surface Analysis using Model Order Reduction," École Polytechnique de Montréal, Strategic Project Grant Meeting, July 12 2016.

[SA20] P. Triverio, "Skin Effect Modeling in Transmission Lines with Arbitrary Cross-Section, with Application to the Modeling of Power Cables and Integrated Interconnects," Webinar to IBM, October 16 2015.

[SA21] **C. Williams** and L. Jimenez-Juan and A. Crean and P. Triverio, "Non-Invasive Assessment of Aortic Coarctation Through Computational Fluid Dynamics," Medical Imaging Research TED Talks, Toronto, Canada, June 19 2015.

[SA22] P. Triverio, "Accelerating the Finite-Difference Time-Domain Method for Maxwell Equations through Model Order Reduction and CFL Limit Extension," International School for Advanced Studies (SISSA), Trieste, Italy, December 16 2014.

[SA23] P. Triverio, "MoM-SO: a Fast Method for Computing the Impedance of Power and Microelectronic Cables Including Skin, Proximity, and Ground Return Effects," École Polytechnique de Montréal, Montreal, QC, December 5 2014.

[SA24] P. Triverio, "Accelerating Finite-Difference Time-Domain Simulations beyond the CFL Limit through Model Order Reduction," McGill University, Montreal, QC, December 4 2014.

[SA25] P. Triverio, "Macromodeling for Signal Integrity and Electromagnetic Compatibility," Blackberry, Waterloo, ON, May 8 2014.

[SA26] P. Triverio, "MoM-SO: an Efficient Surface Method for Computing the Series Impedance of Power and Microelectronic Cables," University of Waterloo, Waterloo, ON, May 8 2014.

[SA27] P. Triverio, "Fast Cable Impedance Calculations using MoM-SO," Workshop of Consortium "Electromagnetic transients in future power systems", Trondheim, Norway, September 11 2013.

[SA28] P. Triverio, "Macromodeling of interconnects in high-speed electronic systems and power grids," SINTEF Energy Research, Trondheim, Norway, September 9 2013.

[SA29] P. Triverio, "Fundamentals of Macromodeling for Mixed-Domain Designs," IEEE International Workshop on High-Performance Chip, Package and Systems, Ottawa, Canada, 24 November 2012, (invited tutorial).

[SA30] P. Triverio, "Physical Consistency of Computer Aided Design Models," IMS2012 International Microwave Symposium, Montreal, Canada, 17-22 June 2012, (invited tutorial).

[SA31] P. Triverio, "Macromodeling for Signal Integrity and Electromagnetic Compatibility," AMD, Markham, Ontario, AMD, Markham, Ontario, May 31st 2012.

[SA32] P. Triverio, "Model order reduction of electric and electromagnetic systems by system identification," École Polytechnique Fédérale, Lausanne, Switzerland, April 13th 2011.

[SA33] P. Triverio, "Modeling and Simulation of High-Speed Interconnects by System Identification: Recent Developments and Perspectives," University of Toronto, Toronto, Canada, May 12th 2011.

[SA34] P. Triverio, "Modeling and Simulation of High-Speed Interconnects: Approaches, Challenges and Solutions - part II," 14th IEEE Workshop on Signal Propagation on Interconnects, Hildesheim, Germany, 9–12 May 2010, (invited tutorial).

[SA35] P. Triverio, S. Grivet-Talocia, "Identification of Parametric Models with Uniform Stability and Passivity Constraints," XXVI Riunione Nazionale dei Ricercatori di Elettrotecnica, Naples, Italy, 9–11 June 2010.

[SA36] P. Triverio, "Model order reduction of linear systems via identification: the Vector Fitting method and its recent parametric extensions," Massachusetts Institute of Technology (MIT), Cambridge, MA, Massachusetts Institute of Technology (MIT), Cambridge, MA, December 10th 2010.

[SA37] P. Triverio, "Modeling and Simulation of Broadband Electronic Systems: the Black-box Identification Approach," Hamburg University of Technology (TUHH), Hamburg, Germany, Hamburg University of Technology (TUHH), Hamburg, Germany, September 17th 2010.

[SA38] P. Triverio, M. Nakhla, "Fundamentals of Macromodeling for Signal Integrity Analysis," IEEE 18th Conference on Electrical Performance of Electronic Packaging and Systems, Portland, OR, 19–21 October 2009, (invited tutorial).

Supervisory Experience (in progress)

Ph.D. Students (Electrical & Computer Engineering)

2021 - 2024 **Yiyang Fu**, *Co-supervision: Dr. Laura Jimenez-Juan*
Topic: Development of an advanced 1D-3D cardiovascular simulator for biomedical applications

2021 - 2026 **Yongzhong Li**
Topic: A Multigrid Boundary Element Methods for Maxwell Equations

2021 - 2026 **Qinghao Zhang**
Topic: Scalable Algorithms for Processing and Meshing IC Layouts for Electromagnetic Simulation

2018 - 2022 **Damian Marek**
Topic: A Scalable Parallel Solver for the Electromagnetic Analysis of Multiscale Structures with Lossy Conductors in Layered Media

Ph.D. Students (Biomedical Engineering)

2021 - 2025 **Nhien Tran-Nguyen**, *Co-supervision: Dr. Laura Jimenez-Juan*
Thesis: Understanding the Role of Biomechanics in the Failure of Coronary Artery Bypass Grafts: a Study Based on Computational Fluid Dynamics

M.A.Sc. Students (Electrical & Computer Engineering)

2023 - 2025 **Jasper Hatton**
Topic: Advanced preconditioners for IC electromagnetic analysis

2024 - 2026 **Atacan Tuhan**
Topic: TBD

Research Assistants

2023 - 2024 **Ruoyi Xie**
Topic: Meshing Very Large IC Layouts for Electromagnetic Analysis

4th Year Thesis Students (Engineering Science)

2024 - 2025 **Michael Acquaviva**

2024 - 2025 **Ethan Sovde**

Supervisory Experience (completed)

Graduated Post-Doctoral Fellows (Electrical & Computer Engineering)

2020 - 2021 **Reza Gholami**, *Co-supervision: Prof. S. Hum*, Currently: Senior 3D EM solver developer, Mentor Graphics
Topic: Computational Modeling of Metasurface Antennas and Metamaterials

2018 - 2019 **Francesca Condemi**, *Co-supervision: Dr. L. Jimenez-Juan*, Currently: R&D Lead Engineer, Corwave
Topic: Towards an Early Detection of Coronary Artery Bypass Graft Failure: A Computational Fluid Dynamics Approach Based on CT and 4D-Flow MRI

2015 - 2017 **Shunchuan Yang**, Currently: Assistant Professor, Beihang University
Topic: Fast Electromagnetic Analysis for Interconnects in 3D Integrated Circuits

2023 - 2024 **Pasquale Cambareri**, *Co-supervision: Prof. Sean Hum*, Currently: Postdoctoral fellow, University of Toronto
Topic: Fast Analysis of Advanced Electromagnetic Surfaces

Graduated Ph.D. Students (Electrical & Computer Engineering)

2016 - 2024 **Fadime Bekmambetova**, Currently: Research Scientist, Nanoacademic Technologies Inc.
Thesis: Conservation Properties of Finite-Difference Time-Domain Methods for the Maxwell and Schrödinger Equations With Application to the Development of New Schemes with Guaranteed Stability

2017 - 2022 **Shashwat Sharma**, Currently: Signal and power integrity engineering, Nvidia
Thesis: Advanced Boundary Element Techniques for Multiregion and Multiscale Electromagnetic Modelling

2014 - 2019 **Xinyue Zhang**, Currently: Assistant Professor, University College Dublin, Ireland
Thesis: Reduced-Order Modeling in the Finite-Difference Time-Domain Method

2014 - 2019 **Utkarsh Patel**, *Co-supervision: Prof. S. Hum*, Currently: Postdoc, University of Michigan
Thesis: Reduced-Order Integral Equation Methods To Solve Complex Electromagnetic Problems

Graduated M.A.Sc. Students (Electrical & Computer Engineering)

2019 - 2021 **Yiyang Fu**, *Co-supervision: Dr. Laura Jimenez-Juan*, Currently: PhD student, University of Toronto
Thesis: A Comparative Study of Regular- and High-Fidelity Solvers for the Prediction of Aortic Hemodynamics

2015 - 2017 **Zihan Chen**, *Co-supervision: Dr. Laura Jimenez-Juan*, Currently: Intel
Thesis: Non-Invasive Assessment of Aortic Coarctation Severity Using Computational Fluid Dynamics

2014 - 2017 **Chen Sun**, Currently: Bell
Thesis: Minimizing Dispersion in FDTD Methods with CFL Limit Extension

2013 - 2015 **Denis Oyaro**, Currently: Microchip Technology
Thesis: Efficient Model Order Reduction of Electrical Networks with Many Ports

2012 - 2014 **Xihao Li**, *Co-supervision: Prof. C. Sarris*, Currently: Microchip Technology
Thesis: Model Order Reduction and Stability Enforcement of Finite-Difference Time-Domain Equations Beyond the CFL Limit

2012 - 2014 **Utkarsh Patel**, Currently: Postdoc, University of Michigan
Thesis: A Surface Admittance Approach For Fast Calculation of the Series Impedance of Cables Including Skin, Proximity, and Ground Return Effects

Graduated M.A.Sc. Students (Biomedical Engineering)

2019 - 2021 **Nhien Tran-Nguyen**, *Co-supervision: Dr. Laura Jimenez-Juan*, Currently: PhD student, University of Toronto
Thesis: Patient-Specific Computational Fluid Dynamics Simulations to Predict Coronary Artery Bypass Graft Remodeling

Former Visiting Ph.D. Students

2020 - 2022 **Elisa Fevola**, *Co-supervision: Prof. S. Grivet Talocia, Prof. G. Rozza, Dr. L. Jimenez-Juan*, From: Politecnico di Torino, Currently: Senior Scientist, AstraZeneca
Topic: Boundary Conditions Estimation Techniques for Cardiovascular Modeling

2014 **Jan Birgen Preibish**, From: Hamburg University of Technology, Germany, Currently: Nexperia Hamburg
Topic: Extension of the Contour Integral Method for Stochastic Modeling of Waveguiding Structures

Former Research Assistants

2017 - 2018 **Niema Binth Mohammad**, Currently: PhD candidate, University of Toronto
Topic: High-Performance Electromagnetic Solver for 3D Silicon Interposers

2015 - 2016 **Yushi Guan**, Currently: Software Engineer, University of Toronto
Topic: Development of a high-performance electromagnetic solver

Former Undergraduate Research Assistants

2023 **Ruihang Zhang**, *Co-supervision: Dr. Laura Jimenez-Juan*, Currently: Undergraduate student, University of Toronto

2023 **Jeffrey Zhao**, Currently: Undergraduate student, University of Toronto

2022 **Yong Da Li**, Currently: Undergraduate student, University of Toronto

2022 **Noah Egnatis**, *Co-supervision: Prof. David Steinman*, Currently: Embedded Software Developer, General Dynamics

2022 **Ruoyi Xie**, Currently: Undergraduate student, University of Toronto

2022 **Felicia Liu**, Currently: Undergraduate student, University of Toronto

2021 **Alison Okumura**, Currently: Graduate student, Nuclear Engineering, MIT

2021 **Iliya Shofman**, Currently: Undergraduate student, University of Toronto

2021 **Charley Xu**, Currently: Undergraduate student, University of Toronto

2020 **Zehua Li**, Currently: Undergraduate student, University of Toronto

2020 **Jondy Chen**, Currently: Undergraduate student, University of Toronto

2019 **Raghav Srinivasan**, Currently: Undergraduate student, University of Toronto

2019 **D. L.**, *Co-supervision: Dr. Laura Jimenez-Juan*, Currently: Undergraduate student, University of Toronto

2018 **Salar Hosseini Khorasgani**, Currently: Undergraduate student, University of Toronto

2018 **Connor Frames**, Currently: Intern, Microsemi Co

2016 **Fadime Bekmambetova**, Currently: PhD candidate, University of Toronto

2016 **Luyuan Chen**, Currently: MASc candidate, University of Toronto

2015 **Fadime Bekmambetova**, Currently: PhD candidate, University of Toronto

2015 **Curtis Williams**, *Co-supervision: Dr. Laura Jimenez-Juan*, Currently: Medicine student, University of Toronto

2015 **Aijia Gao**, Currently: Hydro One
2014 **Rein Otsason**, Currently: MASc student, University of Toronto
2014 **Pushkar Bettadpur**, Currently: MASc student, University of Toronto
2012 **Fabian Chow**, Currently: Deloitte
2012 **Stefania Raimondo**, Currently: MASc student, University of Toronto

Former 4th Year Thesis Students (Engineering Science)

2022 - 2023 **Yong Da Li**, Currently: MASc student
2022 - 2023 **Jasper Hatton**, Currently: MASc student, University of Toronto
2021 - 2022 **Mackenzie Seward**, Currently: Undergraduate student, University of Toronto
2020 - 2021 **Lancy Wang**, Currently: Undergraduate student, University of Toronto
2019 - 2020 **Siyu Xu**, Currently: Undergraduate student, University of Toronto
2018 - 2019 **Karl Chen**, Currently: Google, US
2016 - 2017 **Qianshu Lu**, Currently: PhD student, Harvard University
2015 - 2016 **Fadime Bekmambetova**, Currently: PhD student, University of Toronto
2015 - 2016 **Aijia Gao**, Currently: Hydro One

Former 4th Year Project Students (Electrical & Computer Engineering)

2015 - 2016 **Chenyi Mao**, Currently: n/a
2015 - 2016 **Xinyi Chang**, Currently: Kraft Heinz
2015 - 2016 **Thianyu Zhou**, Currently: MASc candidate, University of Toronto
2013 - 2014 **Clint Deygoo**, Currently: Alphawave IP
2013 - 2014 **Zhiyao Ma**, Currently: n/a
2013 - 2014 **Sze Tam**, Currently: Toronto Transit Commission
2013 - 2014 **Seyed Yasrebi**, Currently: Founder, Arnocular
2013 - 2014 **Yiwen Shen**, Currently: PhD candidate, Columbia University
2012 - 2013 **Irwin D'Souza**, Currently: Compiler Developer, IBM
2012 - 2013 **Kristoffer Atienza**, Currently: n/a
2012 - 2013 **Vinu Deokaran**, Currently: Senior software developer, GM
2012 - 2013 **Seung Youn**, Currently: n/a
2012 - 2013 **Soon Kwon**, Currently: Member Technical Staff, AMD

Awards won by my students

Graduate students

2024 **Best Paper Award**, *Damian Marek*, 33rd IEEE Conference on Electrical Performance of Electronic Packaging and Systems

2024 **Best Benchmark Paper Award**, *Damian Marek*, 33rd IEEE Conference on Electrical Performance of Electronic Packaging and Systems

2024 **Queen Elizabeth II Graduate Scholarship in Science and Technology (QEII-GSST)**, *Jasper Hatton*

2024 **TICRA Travel Grant**, *Yongzhong Li*, 2024 IEEE International Symposium on Antennas and Propagation

2023 **Best Benchmark Paper Award**, *Yongzhong Li*, 32nd IEEE Conference on Electrical Performance of Electronic Packaging and Systems

2023 **Fellowship**, *Yongzhong Li*, IEEE Antennas and Propagation Society

2023 **Honorable Mention**, *Damian Marek*, 2023 IEEE International Symposium on Antennas and Propagation

2022 **Best Benchmark Paper Award**, *Qinghao Zhang*, 31st IEEE Conference on Electrical Performance of Electronic Packaging and Systems

2022 **IEEE EPS Student Travel Grant**, *Qinghao Zhang*, 31st IEEE Conference on Electrical Performance of Electronic Packaging and Systems

2023 **Ontario Graduate Scholarship**, *Damian Marek*

2022 **Best Student Paper Award**, *Shashwat Sharma*, 16th European Conference on Antennas and Propagation (EuCAP)

2021 **2021 Piergiorgio L. E. Uslenghi Letters Prize Paper Award**, *Shashwat Sharma*, IEEE Antennas and Propagation Society
For [J19], chosen among about 500 manuscripts published in 2020

2021 **Honorable Mention**, *Damian Marek*, 2021 IEEE International Symposium on Antennas and Propagation

2021 **Doctoral Completion Award**, *Fadime Bekmambetova*

2021 **Ontario Graduate Scholarship**, *Damian Marek*

2021 **Paul Biringer Graduate Scholarship**, *Shashwat Sharma*, Electrical and Computer Engineering Department, University of Toronto

2021 **TICRA-EurAAP Grant**, *Shashwat Sharma*, 15th European Conference on Antennas and Propagation (EuCAP)

2020 **Mergelas Family Graduate Student Award**, *Nhien Tran-Nguyen*, Faculty of Medicine, University of Toronto

2020 **Queen Elizabeth II Graduate Scholarship in Science and Technology (QEII-GSST)**, *Damian Marek*

2020 **2nd prize, Student Paper Contest**, *Shashwat Sharma*, 2020 URSI North American Radio Science Meeting

2020 **Honorable Mention**, *Shashwat Sharma*, 2020 IEEE International Symposium on Antennas and Propagation

2020 **Donald R. Studney Electromagnetics Graduate Award**, *Fadime Bekmambetova*, Electrical and Computer Engineering Department, University of Toronto

2019 **Queen Elizabeth II Graduate Scholarship in Science and Technology (QEII-GSST)**, *Damian Marek*

2019 **Chinese Government Award for Outstanding Students Abroad**, *Xinyue Zhang*

2019 **Honorable Mention**, *Shashwat Sharma*, IEEE International Symposium on Antennas and Propagation

2019 **Honorable Mention**, *Utkarsh Patel*, IEEE International Symposium on Antennas and Propagation

2018 **Finalist for Best Student Paper Award**, *Shashwat Sharma*, 27th IEEE Conference on Electrical Performance of Electronic Packaging and Systems

2021 **Doctoral Completion Award**, *Utkarsh Patel*

2018 **NSERC Postgraduate Scholarships-Doctoral Program (PGS-D)**, *Fadime Bekmambetova*

2018 **IEEE Antennas and Propagation Society Doctoral Research Grant**, *Utkarsh Patel*

2017 **Huawei Prize**, *Fadime Bekmambetova*, Electrical and Computer Engineering Department, University of Toronto

2017 **Best Paper Award**, *Utkarsh Patel, Shashwat Sharma and Shunchuan Yang*, 26th IEEE Conference on Electrical Performance of Electronic Packaging and Systems

2017 **Best Student Paper Award**, *Utkarsh Patel*, 21st IEEE Workshop on Signal and Power Integrity

2017 **Honorable Mention**, *Utkarsh Patel*, IEEE International Symposium on Antennas and Propagation

2017 **NSERC Canada Graduate Scholarships-Master's (CGS-M)**, *Fadime Bekmambetova*

2016 **Best Student Paper Award**, *Fadime Bekmambetova and Xinyue Zhang*, 25th IEEE Conference on Electrical Performance of Electronic Packaging and Systems

2016 **Finalist for Best Student Paper Award**, *Utkarsh Patel*, 25th IEEE Conference on Electrical Performance of Electronic Packaging and Systems

2016 **Finalist for Best Student Paper Award**, *Utkarsh Patel*, IEEE International Conference on Signal and Power Integrity

2016 **NSERC Alexander Graham Bell Canada Graduate Scholarships-Doctoral Program (CGS-D)**, *Utkarsh Patel*

2015 **3rd Student Paper Prize**, *Jan B. Preibisch*, IEEE International Conference on Numerical Electromagnetic and Multiphysics Modeling and Optimization

Undergraduate Students

2023 **Engineering Science Research Opportunity Program (ESROP) Fellowship**, *Ruihang Zhang*

2023 **Guaranteed summer studentship, ECE department**, *Jeffrey Zhao*

2022 **NSERC USRA Summer Research Award**, *Felicia Liu*

2022 **NSERC USRA Summer Research Award**, *Jong Da Li*

2021 **NSERC USRA Summer Research Award**, *Alison Okumura*

2021 **NSERC USRA Summer Research Award**, *Iliya Shofman*

2020 **Engineering Science Research Opportunity Program Fellowship**, *Zehua Li*

2019 **NSERC USRA Summer Research Award**, *D. L.*

2019 **Kenneth Carless Smith Engineering Science Research Fellowship**, *Raghav Srinivasan*

2018 **NSERC USRA Summer Research Award**, *Salar Hosseini Khorasgani*

2015, 2016 **NSERC USRA Summer Research Award**, *Fadime Bekmambetova*

2015 **Heart and Stroke Foundation of Ontario Summer Medical Student Award**, *Curtis Williams*, (150+ applicants)

2014 **UnERD Runner-up in Electrical and Computer Engineering category**, *Rein Otsason*

2014 **NSERC USRA Summer Research Award**, *Pushkar Bettadpur*

2014 **Certificate of Excellence in 4th year project**, *Yiwen Shen and Nima Yasrebi*

2012 **UnERD Runner-up in Electrical and Computer Engineering category**, *Stefania Raimondo*

2012 **NSERC USRA Summer Research Award**, *Fabian Chow*

2012 **NSERC USRA Summer Research Award**, *Stefania Raimondo*

Funding

Funded Research Programs as Sole Investigator

2011 **ECE department, University of Toronto**, *Operating*, $100,000
Project: start-up funds

2012 **SINTEF, Norway**, *Operating*, $8,550
Project: frequency-dependent modeling of multi-phase power cables

2013 **SINTEF**, *Operating*, $35,000
Project: broadband modelling of complex power cables including the effect of ground return

2013 - 2018 **Government of Canada**, *Operating*, $500,000
Project: Canada Research Chair in Modeling of Electrical Interconnects

2013 - 2019 **NSERC Discovery**, *Operating*, $150,000
Project: Advanced Techniques for the Modeling of Electrical Interconnects

2013 **Connaught New Researcher Award, University of Toronto**, *Operating*, $10,000
Project: Stochastic models of high-speed interconnects for time-domain analysis

2013 **Leader's Opportunity Fund, Canada Foundation for Innovation**, *Equipment*, $100,000
Project: Interconnects Characterization Facility

2013 **Ontario Research Fund**, *Equipment*, $100,000
Project: Interconnects Characterization Facility

2014 - 2018 **Infrastructure Operating Fund, Canada Foundation for Innovation**, *Operating*, $30,000
Project: Interconnects Characterization Facility

2016 - 2017 **AMD**, *Operating*, $50,000
Project: High-Performance Electromagnetic Solver for 3D Silicon Interposers

2016 - 2017 **NSERC Collaborative Research and Development Grants**, *Operating*, $71,428
Project: High-Performance Electromagnetic Solver for 3D Silicon Interposers

2016 - 2020 **Ontario Early Researcher Award**, *Operating*, $150,000
Project: Fast Simulation Techniques to Tackle the Design Complexity of Future 3D Integrated Circuits and Antennas

2018 - 2023 **Government of Canada**, *Operating*, $500,000
Project: Canada Research Chair in Computational Electromagnetics

2018 - 2019 **AMD**, *Operating*, $50,000
Project: A scalable electromagnetic solver for interconnect networks in 3D integrated circuits

2018 - 2019 **NSERC Collaborative Research and Development Grants**, *Operating*, $71,428
Project: A scalable electromagnetic solver for interconnect networks in 3D integrated circuits

2019 - 2025 **NSERC Discovery**, *Operating*, $198,000
Project: Taming complexity in computational electromagnetism: a model order reduction approach

2022 - 2023 **AMD/ATI Technologies**, *Operating*, $200,000
Project: An accurate and high-capacity electromagnetic solver for integrated circuit design

2022 - 2023 **NSERC Alliance**, *Operating*, $142,856
Project: An accurate and high-capacity electromagnetic solver for integrated circuit design

2024 - 2025 **AMD/ATI Technologies**, *Operating*, $200,000
Project: A highly-scalable electromagnetic solver for interconnect networks in 3D integrated circuits

Annual Release of Funds (grants as sole investigator, in thousands of CA$)

Program	2012	'13	'14	'15	'16	'17	'18	'19	'20	'21	'22	'23	'24	'25	'26
Start-up	100														
SINTEF	9	35													
Canada Research Chair		100	100	100	100	100	100	100	100	100	100				
NSERC Discovery		25	25	25	25	25	25	33	33	33	33	33	33		
Connaught		10													
CFI			100												
ORF			100												
CFI-IOF			6	6	6	6	6								
NSERC CRD/Alliance					36	36	36	36			71	71			
AMD/ATI					25	25	25	25			100	100	100	100	
Ontario Early Res. Award					30	30	30	30	30						
Year total	109	170	331	131	222	222	222	224	163	133	304	204	133	100	0
Total															2668

Funded Research Programs with Other Investigators

The following acronyms are used: lead PI (leading principal investigator), PI (principal investigator), CI (co-investigator).

2015 **NSERC Research Tools and Instruments Grant**, *Equipment*, $149,820, PI +3
Project: Infrastructure for Electromagnetic Compatibility Characterization and Radiation Measurements of Radio-frequency Circuits and Antennas

2015 **Medical Imaging Dept. Seed Funds, University of Toronto**, *Operating*, $15,000, PI + 2
Project: Non-Invasive Assessment of Aortic Coarctation through Computational Fluid Dynamics

2015 - 2018 **NSERC Strategic Partnerships Grant for Projects**, *Operating*, $538,400, PI + 3
Project: Advanced Electromagnetic Surfaces for Next-Generation Communication Systems

2016 - 2019 **Dean's Strategic Fund, University of Toronto**, *Operating*, $193,000, PI + 10
Project: Toward a Centre in Computational Science & Engineering

2016 **Medical Imaging Dept. Seed Funds, University of Toronto**, *Operating*, $15,000, PI + 1
Project: Non-invasive Biomarkers for Coronary Artery Graft Failure: a Computational Fluid Dynamics Approach

2018 - 2019 **Radiological Society of North America**, *Operating*, US$150,000, PI + 2
Project: Towards an Early Detection of Coronary Artery Bypass Graft Failure: A Computational Fluid Dynamics Approach Based on CT and 4D-Flow MRI

2018-2025 **Jean & Lauri Hiivala Research Fund for Heart Health**, *Operating*, $100,000, PI + 2

Project: Towards an Early Detection of Coronary Artery Bypass Graft Failure: A Computational Fluid Dynamics Approach Based on CT and 4D-Flow MRI

2018 **Private Donor**, *Operating*, $1,000 , PI + 2

Project: Towards an Early Detection of Coronary Artery Bypass Graft Failure: A Computational Fluid Dynamics Approach Based on CT and 4D-Flow MRI

2018 - 2021 **NSERC Strategic Partnerships Grant for Projects**, *Operating*, $473,775, PI + 2

Project: Innovative Satellite Antennas for Emerging M2M/IoT Applications

2020 - 2021 **Dean's Strategic Fund, University of Toronto**, *Operating*, $40,000, PI + 10

Project: Centre in Computational Science & Engineering

2021 - 2023 **EMHSeed program, University of Toronto**, *Operating*, $120,000, CI + 3

Project: A patient-specific experimental and computational platform to identify failure mechanisms of coronary artery bypass grafts

Annual Release of Funds (grants with other investigators, in thousands of CA$)

Program	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
NSERC RTI	150										
Medical Imaging	15	15									
NSERC SPG-P	197	191	150	151	173	151					
Dean's Strategic		53	65	75		25	15				
RSNA/Medical Imag.				94	94						
Hiivala Res. Fund				50	10	5		5	10	10	10
Private Donors				1							
EMHSeed							60	60			

In-Kind Contributions to Research Programs (selected)

2016 - 2017 **AMD**, *Test cases*, *Approx value*: $10,000

2018 - 2019 **AMD**, *Computing resources*, *Approx value*: $140,000

2019 - 2020 **Compute Canada**, *Computing resources (190 core years)*, *Approx value*: $23,041

2020 - 2021 **Compute Canada**, *Computing resources (163 core years)*, *Approx value*: $19,721

2021 - 2022 **Compute Canada**, *Computing resources (170 core years)*, *Approx value*: $20,628

2022 - 2023 **Compute Canada**, *Computing resources (641 core years + 7TB storage)*, *Approx value*: $79,553

2023 - 2024 **Digital Research Alliance of Canada**, *Computing resources (599 core years + 7 TB storage)*, *Approx value*: $62,751

2024 - 2025 **Digital Research Alliance of Canada**, *Computing resources (510 core years + 7 TB storage)*, *Approx value*: $55,306

2025 - 2026 **Digital Research Alliance of Canada**, *Computing resources (831 core years + 10 TB storage)*, *Approx value*: $91,739

Funding for Teaching Improvement

2015 **Temporary Special Levy Fund, University of Toronto**, *Equipment*, $10,642, PI + 2
Project: Demonstration kits for electric and electromagnetic phenomena

2022 **SGS Graduate Education Innovation Fund**, *Operational*, $5,000, Sole PI
Project: Rethinking Computational Education: an Active and Experiential Learning Approach that Blends Theory, Coding and Real Applications (success rate: 19%)

Service

University Service

Education Committee, Center for Computational Science & Engineering, 2021 - present

Advisory Committee and Electromagnetics Group Chair, Electrical and Computer Engineering Department, 2021/22

Distinguished Lecture Series Coordinator, Electrical and Computer Engineering Department, 2017/18

Graduate Matters Committee, Electrical and Computer Engineering Department, 2017/18, 2019/20 - 2023/24

Graduate Coordinator, Electromagnetics Group, Electrical and Computer Engineering Department, 2013/14 - 2017/18, 2021/22 - 2023/24

Workload Policy Review Committee, Electrical and Computer Engineering Department, 2015

International Journals (editorial board memberships)

2018 - present **Associate Editor**, *IEEE Transactions of Components, Packaging and Manufacturing Technology*

International Conferences (chair positions)

2024 **General Chair**, *IEEE Conference on Electrical Performance of Electronic Packaging and Systems*

2023 **Co-Chair**, *IEEE Conference on Electrical Performance of Electronic Packaging and Systems*

International Conferences (committee memberships)

2023 - 2026 **Steering Committee**, *IEEE Conference on Electrical Performance of Electronic Packaging and Systems*

2017 - present **Technical Program Committee**, *IEEE Conference on Electrical Performance of Electronic Packaging and Systems*

2016 - present **Technical Program Committee**, *IEEE Workshop on Signal and Power Integrity*

2020, 2022 - present **Technical Program Committee**, *European Conference on Antennas and Propagation*

2019 **Chair, Paper Awards Committee**, *IEEE Conference on Electrical Performance of Electronic Packaging and Systems*

2016 **Technical Program Committee**, *IEEE International Conference on Signal and Power Integrity*

2015 **Steering Committee**, *IEEE AP-S Symposium on Antennas and Propagation and URSI CNC/USNC Joint Meeting*

2015 **Technical Program Review Committee**, *IEEE MTT-S International Conference on Numerical Electromagnetic and Multiphysics Modeling and Optimization for RF, Microwave and Terahertz Applications (NEMO)*

2012 - present **Technical Program Committee**, *IEEE International Workshop on High-performance Chip, Package, and Systems*

International Conferences (session organizer)

2016 **Special session on "Multiphysics modeling for Analog/RF/MEMS/optical chip-package-systems"**, *IEEE International Conference on Signal and Power Integrity*

2016 **Special session on "Model Order Reduction"**, *IEEE Workshop on Signal and Power Integrity*

2015 **Special session on "Numerical methods for Signal and Power Integrity"**, *IEEE MTT-S International Conference on Numerical Electromagnetic and Multiphysics Modeling and Optimization for RF, Microwave and Terahertz Applications (NEMO)*

Committee Member for IEEE Societies

2019 - 2023 **Electrical Design, Modeling, and Simulation Technical Committee**, *IEEE Electronics Packaging Society*

2020 - present **Advisor, IEEE AP-S student chapter**, *University of Toronto*

Reviewer (funding agencies)

- NSERC
- Israel Science Foundation

Reviewer (tenure cases)

- Three cases

Reviewer (journals)

- Springer Cardiovascular Engineering and Technology
- IEEE Transactions on Antennas and Propagation
- IEEE Transactions on Microwave Theory and Techniques
- IEEE Journal on Multiscale and Multiphysics Computational Techniques
- IEEE Microwave and Wireless Components Letters
- IEEE Access
- IEEE Transactions on Circuits and Systems
- IEEE Journal of Electromagnetics, RF, and Microwaves in Medicine and Biology
- IEEE Transactions on Electromagnetic Compatibility
- IEEE Transactions on Components, Packaging and Manufacturing Technology
- IEEE Transactions on Power Delivery
- Elsevier Journal of Biomechanics
- Elsevier Journal of Computational Physics
- Elsevier AEÜ International Journal of Electronics and Communications

Reviewer (conferences)

2021 - pres. European Conference on Antennas and Propagation

2016 - pres. IEEE Workshop on Signal and Power Integrity

2016 - pres. IEEE Conference on Electrical Performance of Electronic Packaging and Systems

2020 IEEE International Symposium on Antennas and Propagation and USNC-URSI Radio Science Meeting

2015 Joint IEEE International Symposium on Electromagnetic Compatibility and EMC Europe

2015 IEEE Symposium on Electromagnetic Compatibility and Signal Integrity

2013 Design, Automation and Test in Europe conference (DATE)

2013 IEEE 11th International NEWCAS Conference

2011 International Conference on Computer-Aided Design (ICCAD)

Panelist

2023 **Panelist, "Hack the Heart"**, *University of Toronto*

Thesis and Qualification Exam Committees

M.A.Sc. thesis proposal committees	12
M.A.Sc. thesis committees as examiner	17
M.A.Sc. thesis committees as chair	9
M.A.Sc.-Ph.D. transfer proposal committees	1
Ph.D. qualification exam committees	47
Ph.D. qualification exam committees (other universities)	1
Ph.D. proposal review committees	20
Ph.D. progress review committees	5
Ph.D. thesis committees as external appraiser or examiner (other universities)	4
Ph.D. thesis committees as examiner	10
Ph.D. thesis committees as chair	4
SGS committees as examiner	18
SGS committees as chair	3
Total	151

Youth Outreach

Let's Talk Science Outreach, Toronto, 2017 and 2018

Ontario Universities' Fair, 2012 and 2013

Professional Memberships

- IEEE (Senior Member)
- IEEE Microwave Theory and Techniques Society
- IEEE Antennas and Propagation Society Membership
- IEEE Components, Packaging, and Manufacturing Technology Society
- European Association on Antennas and Propagation (EurAAP)
- Professional Engineers of Ontario

Leaves

Research & Study Leaves (sabbatical year)

- July 2024 - December 2024
- July 2018 - June 2019

Parental Leaves

- June - August 2019
- September - November 2017
- September - November 2016

Languages

- Italian (mother tongue), English (fluent), French (intermediate), Spanish (intermediate)

References

- Available upon request

Toronto, April 28, 2025