Piero Triverio

Associate 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

2017 - **Associate professor**, *University of Toronto*, Canada.
Department of Electrical and Computer Engineering (July 2017 - present)
Institute of Biomedical Engineering (July 2018 - present)
Cardiovascular Sciences Collaborative Specialization (October 2019 - present)

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

Previous position

2011 - 2017 **Assistant professor**, *University of Toronto*, Canada.
Department of Electrical and Computer Engineering (September 2011 - June 2017)

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 macro-models 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

2010, 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

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 won by students under my supervision (selected)

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%)
	(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	n/a (not enough students)

†: Average student evaluation for the question "What is your overall rating of this 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, 2019, (in press, arxiv: 1908.08977).

Full Refereed Journals (submitted)

[JS1] **S. Sharma** and P. Triverio, "AIMx: An Extended Adaptive Integral Method for the Fast Electromagnetic Modeling of Complex Structures," *IEEE Trans. Antennas Propag.*, 2020.

[JS2] **S. Sharma** and P. Triverio, "A Fully-Accelerated Surface Integral Equation Method for the Electromagnetic Modeling of Arbitrary Objects," *IEEE Trans. Antennas Propag.*, 2020.

Full Refereed Journals (published or in press)

[J1] **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.*, 2020.

[J2] **U. R. Patel**, P. Triverio, and S. V. Hum, "A Fast Macromodeling Approach to Efficiently Simulate Inhomogeneous Electromagnetic Surfaces," *IEEE Trans. Antennas Propag.*, 2020.

[J3] 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.*, 2020.

[J4] **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.

[J5] **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.

[J6] **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.

[J7] **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.

[J8] **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.

[J9] **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.

[J10] 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.

[J11] **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.

[J12] **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.

[J13] **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.

[J14] **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.

[J15] **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.

[J16] 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.

[J17] **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.

[J18] 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.

[J19] 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.

[J20] 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.

[J21] 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.

[J22] 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.

[J23] 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.

[J24] 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] **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.

[C2] **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.

[C3] 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**).

[C4] 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**).

[C5] **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.

[C6] **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.

[C7] **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.

[C8] **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.

[C9] **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**).

[C10] **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.

[C11] **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**).

[C12] **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.

[C13] **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**).

[C14] **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.

[C15] **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.

[C16] **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.

[C17] **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**).

[C18] **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**).

[C19] **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.

[C20] **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.

[C21] **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**).

[C22] **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.

[C23] **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.

[C24] **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**).

[C25] **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**).

[C26] **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.

[C27] **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**).

[C28] **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.

[C29] **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.

[C30] **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.

[C31] **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.

[C32] **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.

[C33] **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**).

[C34] **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.

[C35] **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.

[C36] **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.

[C37] 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**).

[C38] **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.

[C39] **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.

[C40] 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.

[C41] **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.

[C42] **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.

[C43] 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.

[C44] 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**).

[C45] 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.

[C46] 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.

[C47] 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.

[C48] 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.

[C49] 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.

[C50] 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.

[C51] 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**).

[C52] 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.

[C53] 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.

[C54] 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**).

[C55] 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.

[C56] 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] E. Fevola, F. Ballarin, L. Jimenez-Juan, P. Triverio, G. Rozza, S. Grivet-Talocia, "An Energy-Based Optimization Framework for Characterization of Patient-Specific Coronary Artery Bypass Grafts," in *Toronto Biomedical Engineering Conference*, Toronto, Canada, May 20 2020.

[NC2] Z. Zainib, F. Ballarin, G. Rozza, P. Triverio and L. Jimenez-Juan, "Reduced order methods for parametric optimal flow control in patient-specific coronary bypass grafts: geometrical reconstruction, data assimilation," in *Summer School on Reduced Order Methods in Computational Fluid Dynamics*, Trieste, Italy, July 8-12 2019.

[NC3] **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.

[NC4] **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.

[NC5] 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.

[NC6] **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, "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.

[SA2] 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.

[SA3] 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.

[SA4] P. Triverio, "Accelerating Multiscale FDTD Simulations with Model Order Reduction," University of Applied Sciences Rapperswil, Rapperswil, Switzerland, Nov 20 2018.

[SA5] 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.

[SA6] **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).

[SA7] 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).

[SA8] P. Triverio, "A Dissipation Theory for FDTD With Application to the Stable Model Order Reduction of FDTD Equations," University of Toronto, Feb 2 2018.

[SA9] 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.

[SA10] 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.

[SA11] P. Triverio, "What computational engineering can do for industry and society?" IEEE Student Chapter, University of Toronto, November 17 2016.

[SA12] P. Triverio, "Full-wave Advanced Electromagnetic Surface Analysis using Model Order Reduction," École Polytechnique de Montréal, Strategic Project Grant Meeting, July 12 2016.

[SA13] 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.

[SA14] **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.

[SA15] 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.

[SA16] 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.

[SA17] P. Triverio, "Accelerating Finite-Difference Time-Domain Simulations beyond the CFL Limit through Model Order Reduction," McGill University, Montreal, QC, December 4 2014.

[SA18] P. Triverio, "Macromodeling for Signal Integrity and Electromagnetic Compatibility," Blackberry, Waterloo, ON, May 8 2014.

[SA19] 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.

[SA20] P. Triverio, "Fast Cable Impedance Calculations using MoM-SO," Workshop of Consortium "Electromagnetic transients in future power systems", Trondheim, Norway, September 11 2013.

[SA21] P. Triverio, "Macromodeling of interconnects in high-speed electronic systems and power grids," SINTEF Energy Research, Trondheim, Norway, September 9 2013.

[SA22] 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).

[SA23] P. Triverio, "Physical Consistency of Computer Aided Design Models," IMS2012 International Microwave Symposium, Montreal, Canada, 17-22 June 2012, (invited tutorial).

[SA24] P. Triverio, "Macromodeling for Signal Integrity and Electromagnetic Compatibility," AMD, Markham, Ontario, AMD, Markham, Ontario, May 31st 2012.

[SA25] P. Triverio, "Model order reduction of electric and electromagnetic systems by system identification," École Polytechnique Fédérale, Lausanne, Switzerland, April 13th 2011.

[SA26] P. Triverio, "Modeling and Simulation of High-Speed Interconnects by System Identification: Recent Developments and Perspectives," University of Toronto, Toronto, Canada, May 12th 2011.

[SA27] 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).

[SA28] 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.

[SA29] 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.

[SA30] 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.

[SA31] 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)

Post-Doctoral Fellows

2020 **Reza Gholami**, *Co-supervision: Prof. S. Hum*.
Topic: Computational Modeling of Metasurface Antennas and Metamaterials

Ph.D. Students (Electrical & Computer Engineering)

2018 - 2022 **Damian Marek**.
Topic: Parallelization of a Surface-Based Integral Equation Method for Maxwell Equations

2017 - 2021 **Shashwat Sharma**.
Topic: High-Performance Electromagnetic Solver for 3D Integrated Circuits

2016 - 2020 **Fadime Bekmambetova**.
Topic: Efficient Algorithms for the Joint Solution of Maxwell and Schrodinger equations

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

2019 - 2021 **Yiyang Fu**, *Co-supervision: Dr. Laura Jimenez-Juan*.
Topic: Accurate prediction of hemodynamics in coronary arteries and grafts: a high-order finite elements approach

M.A.Sc. Students (Biomedical Engineering)

2019 - 2021 **Nhien Tran-Nguyen**, *Co-supervision: Dr. Laura Jimenez-Juan*.
Topic: Understanding the Role of Biomechanics in the Failure of Coronary Artery Bypass Grafts: a Study Based on Computational Fluid Dynamics

Visiting Ph.D. Students

2020 **Elisa Fevola**, *Co-supervision: Prof. S. Grivet Talocia, Prof. G. Rozza, Dr. L. Jimenez-Juan*, From: Politecnico di Torino.
Topic: Reduced basis methods applied to the modeling of coronary artery disease

4th Year Thesis Students (Engineering Science)

2020 - 2021 **Lancy Wang**.

Supervisory Experience (completed)

Graduated Post-Doctoral Fellows (Electrical & Computer Engineering)

2018 - 2019 **Francesca Condemi**, *Co-supervision: Dr. L. Jimenez-Juan*, Currently: R&D Simulation 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

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

2014 - 2019 **Xinyue Zhang**, Currently: Analyst, Scotiabank.
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)

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

Former Visiting Ph.D. Students

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

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

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

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

2015 **Curtis Williams**, *Co-supervision: co-supervised with Dr. 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)

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

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 **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.

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

2020 **Engineering Science Research Opportunity Program (ESROP) 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 - 2024 **NSERC Discovery**, *Operating*, $165,000.
Project: taming complexity in computational electromagnetism: a model order reduction approach

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
Start-up	100											
SINTEF	8.5	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
Connaught		10										
CFI			100									
ORF			100									
CFI-IOF			6	6	6	6	6					
NSERC CRD					35.7	35.7	35.7	35.7				
AMD					25	25	25	25				
Ontario Early Res. Award					30	30	30	30	30			
Year total	108.5	170	331	131	221.7	221.7	221.7	223.7	163	133	133	33
											Total	2091.3

Funded Research Programs with Other Investigators

The following acronyms are used: lead PI (leading principal investigator), PI (principal investigator), CO (collaborator).

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

2018-2019 **Jean & Lauri Hiivala Research Fund for Heart Health**, *Operating*, $55,000, 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

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

Program	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
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	5		
Private Donors				1			
Year total	362	259	215	371	272	176	15

Submitted Funding Applications

2020 **Canada Foundation for Innovation, Innovation Fund**, *Equipment*, $4,779,845, PI + 4.
Project: Testbeds for Silicon Monolithic Quantum Processors with Spin-to-Photon Entanglement

2020-2025 **New Frontiers in Research Fund - Transformation**, *Operating*, $3,200,000, PI + 10.
Project: Elevated Temperature Quantum Computational Medicine Platform in CMOS

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.

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

Service

University Service

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

Graduate Matters Committee, Electrical and Computer Engineering Department, 2017/18, 2019/20, 2020/21

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

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 (committee memberships)

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*.

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)*.

Technical Committees of IEEE Societies

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

Reviewer (grants)

- NSERC Discovery Grant

Reviewer (journals)

- IEEE Transactions on Antennas and Propagation
- IEEE Transactions on Microwave Theory and Techniques
- IEEE Microwave and Wireless Components Letters
- 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)

2016 - present IEEE Workshop on Signal and Power Integrity

2016 - present 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)

Thesis and Qualification Exam Committees

M.A.Sc. thesis proposal committees	12
M.A.Sc. thesis committees as examiner	14
M.A.Sc. thesis committees as chair	6
M.A.Sc.-Ph.D. transfer proposal committees	1
Ph.D. qualification exam committees	31
Ph.D. qualification exam committees (other universities)	1
Ph.D. proposal review committees	10
Ph.D. thesis committees as external appraiser (other universities)	1
Ph.D. thesis committees as examiner	2
Ph.D. thesis committees as chair	4
SGS committees as examiner	8
SGS committees as chair	1
Total	91

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
- Professional Engineers of Ontario

Leaves

Research & Study Leaves (sabbatical year)

- 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, September 28, 2020