School of Electrical and Computer Engineering
Purdue University

1/06/2024

Name: Luis J. Gomez

Education:

BSEE/Math	Aug. 2008	University of Florida
MSEE/Appl. Math	May 2014	University of Michigan
PhD	May 2015	University of Michigan

Professional and Honorary Society Memberships:

Tau Beta Pi, 2005 – present
Institute of Electrical and Electronics Engineering (IEEE), 2005 – present
Society of Hispanic Professional Engineers (SHPE), 2005 – present
Society for the Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS), 2019 – present
The Applied Computational Electromagnetics Society 2022 – present
International Union of Radio Science 2023 – present

Honors and Awards:

[1] NSF Graduate Research Fellow, 2009-2012

[2] University of Michigan Rackham Merit Fellow, 2008-2013

[3] University of Michigan EECS Outstanding Graduate Student Instructor Award, 2014

[4] BRAIN Initiative Trainee Travel Award, 2018

[5] K99/R00 BRAIN Initiative Advanced Post-Doctoral Transition Award, 2019

[6] Journal of Neural Engineering Outstanding Reviewer Award, 2019

[7] Applied Computational Electromagnetics Society (ACES) Early Career Award, 2023

Professional Experience

Jan 2015 - July 2016	Post-doctoral Associate, University of Michigan (with Prof. Eric Michielssen)

July 2016 – Aug. 2020	Post-doctoral Associate, Duke University School of Medicine, Psychiatry (with Prof. Angel Peterchev)
Aug. 2020 – present	Assistant Professor, School of Electrical and Computer Engineering, Purdue University

Professional Society Activities

Organization:	Antennas and Propagation Society
Activity:	Special Session organizer and Reviewer, IEEE International Symposium on Antennas and Propagation and ITNC-USNC-URSI Radio Science Meeting, July 2019
Activity:	2022 AP-S Fellowship Reviewer, IEEE International Symposium on Antennas and Propagation and ITNC-USNC-URSI Radio Science Meeting
Activity:	Sponsors and Exhibits Chair, IEEE International Symposium on Antennas and Propagation and ITNC-USNC-URSI Radio Science Meeting, July 2023
Organization:	Brain Initiative
Activity:	2022 BRAIN Initiative Investigator Meeting Program Committee Member
Organization:	National Institute of Mental Health (NIMH)
Activity:	Noninvasive Neuromodulation and Neuroimaging Technologies (ZRG1 NV-Q (91)) Ad Hoc reviewer May 2022, October 2022, October 2023, and February 2024
Organization:	Applied Computational Electromagnetics Society (ACES)
Activity:	Invited session organizer and Reviewer, 2024 International Applied Computational Electromagnetics Society (ACES) Symposium
Organization:	Progress In Electromagnetics Research (PIERS)
Activity:	Special session organizer and Reviewer, 2024 PhotonIcs and Electromagnetics Research Symposium
Organization:	ICBEM International Conference on Bioelectromagnetism
Activity:	Program Committee member
Organization:	U.S. National Committee for the International Union of Radio Science (USNC-URSI)
Activity:	Society Representative for SHPE and SACNAS
Organization:	SACNAS
Activity:	SACNAS working group member

Post-doctoral Associates Currently Being Supervised

Dezhi Wang
Akila Murugesan

Master's and PhD Thesis Students Currently Being Supervised

Nahian I. Hassan PhD
David Matthew Czerwonky PhD
Sina Vaezi PhD (Co-advised Prof. Weng Chew)
Vanine Sabino PhD (Co-advised Prof. Weng Chew)
Masood Nekoie PhD (Co-advised Prof. Weng Chew)

Undergraduate Trainees
Kevin Zhang, ECE
Pravin Jayatissa, ECE
Samuel Morales, ECE
Amanda Walenciak, SURF 2023
Rodrigo Romero, SURF 2023

Visiting Students
David Quintero, ECE (Feb-Aug 2022) (Universidad Nacional de Colombia Bogota, Colombia)

Courses
ECE 20002 Electrical Engineering Fundamentals II (Fall 2020 - Spring 2021; Fall 2022 - Spring 2023; Spring 2024)
ECE 695 Computational Bio-electromagnetics (Fall 2021; Fall 2023)

School Committee Activities

Committee:	ECE Graduate Committee
Activity:	Member, 2020-2023
Committee:	ECE Standing Committee Meeting for Hiring Tenue Track Professors
Activity:	Member, 2023-
Committee:	Faculty Welcome Committee
Activity:	Member, 2023-

Research Book Contributions and Books Published

[1] A. C. Yucel, **L. J. Gomez**, W. Sheng, H. Bagci, and E. Michielssen, "Recent Trends in Uncertainty Quantification for Large-scale Electromagnetic Analysis: From Tensor Product Cubature Rules to Spectral Quantic Tensor Train Approximation," in *New Trends in Computational Electromagnetics* (ed. O. Ergul), pp. 1-31, 2019

[2] R. J. Ilmoniemi, Z. Deng, **L. J. Gomez**, L. M. Koponen, J. O. Nieminen, A. V. Peterchev, and C. M. Epstein, "Transcranial Magnetic Stimulation Coils," in *The Oxford Handbook of Transcranial Stimulation, Second Edition (2 ed.)*, 2022

Serial Journal Articles

[1] L. Hernandez-Garcia, T. Hall, **L. J. Gomez**, and E. Michielssen, "A numerically optimized active shield for improved transcranial magnetic stimulation targeting," *Brain Stimulation: Basic, Translational, and Clinical Research in Neuromodulation*, vol. 3, no. 4, pp. 218-225, 2010.

[2] **L. J. Gomez**, F. Cajko, L. Hernandez-Garcia, A. Grbic, and E. Michielssen, " Numerical Analysis and Design of Single-Source Multicoil TMS for Deep and Focused Brain Stimulation," *IEEE Trans. Biomed. Eng.,* vol. 60, no. 10, pp. 2771-82, 2013.

[3] **L. J. Gomez**, A. C. Yücel, L. Hernandez-Garcia, S. F. Taylor, and E. Michielssen, "Uncertainty quantification in transcranial magnetic stimulation via high-dimensional model representation," *IEEE Transactions on Biomedical Engineering*, vol. 62, no. 1, pp. 361-372, 2015.

[4] **L. J. Gomez**, A. C. Yücel, and E. Michielssen, "Low-frequency stable internally combined volume-surface integral equation for high-contrast scatterers," *IEEE Antennas and Wireless Propagation Letters*, vol. 14, pp. 1423-1426, 2015.

[5] **L. J. Gomez**, A. C. Yücel, and E. Michielssen, "Volume-surface combined field integral equation for plasma scatterers," *IEEE Antennas and Wireless Propagation Letters*, vol. 14, pp. 1064-1067, 2015.

[6] **L. J. Gomez**, A. C. Yucel, and E. Michielssen, "Internally Combined Volume-Surface Integral Equation for a 3D Electromagnetic Scattering Analysis of High Contrast Media," *IEEE Antennas and Wireless Propagation Letters*, vol. 16, pp. 1691-1694, 2017.

[7] A. C. Yucel, **L. J. Gomez**, and E. Micielssen, "Compression of Translation Operator Tensors in FMM-FFT Accelerated SIE Solvers via Tucker Decomposition," *IEEE Antennas and Wireless Propagation Letters*, vol. 16, pp. 2667-2670, 2017.

[8] **L. J. Gomez**, A. C. Yücel, and E. Michielssen, "The ICVSIE: A General Purpose Integral Equation Method for Bio-Electromagnetic Analysis," *IEEE Transactions on Biomedical Engineering*, vol. 65, no. 3, pp. 565-574, 2018.

[9] A. C. Yucel, **L. J. Gomez**, and E. Michielssen, "Internally Combined Volume-Surface Integral Equation for EM Analysis of Inhomogeneous Negative Permittivity Plasma Scatterers," *IEEE Transactions on Antennas and Propagation*, vol. 66, no. 4, pp. 1903-1913, 2018.

[10] B. Wang, Z. Deng, J. Smith, J. Tharayil, C. Gurrey, **L. J. Gomez**, A. Peterchev, "Redesigning existing transcranial magnetic stimulation coils to reduce energy: application to low field magnetic stimulation," *Journal of neural engineering*, 2018.

[11] **L. J. Gomez**, S. Goetz, and A. V. Peterchev, "Design of Transcranial Magnetic Stimulation Coils with Optimal Trade-off between Depth, Focality, and Energy," *Journal of neural engineering*, 2018.

[12] C, Zhuotong, **L. J. Gomez**, S. Zheng, A. C. Yucel, Z. Zhang, V. Okhmatovski, "Sparsity Aware Pre-Corrected Tensor Train Algorithm For Fast Solution of 2D Scattering Problems and Current Flow Modelling on Unstructured Meshes," *Transactions on Microwave Theory and Techniques*, vol. 67, no. 12, 2019.

[13] **L. J. Gomez**, M. Dannhauer, L. M. Koponen and A. Peterchev, "Conditions for numerically accurate TMS electric field simulation," *Brain Stimulation: Basic, Translational, and Clinical Research in Neuromodulation*, vol. 13, no. 1, pp. 157-166, 2020.

[14] **L. J. Gomez**, M. Dannhauer and A. Peterchev, " Fast computational optimization of TMS coil placement for individualized electric field targeting," *NeuroImage*, vol. 228, no. 3, pp. 1-13, 2021.

[15] H. Zhang, J. Guilleminot and **L. J. Gomez**, " Stochastic modeling of geometrical uncertainties on complex domains, with application to additive manufacturing and brain interface geometries," *Computer methods in applied mechanics and engineering*, vol. 385, no. 3, pp. 114014, 2021.

[16] Wang, M., Qian, C., Di Lorenzo, E., Gomez, L.J., Okhmatovski, V. and Yucel, A.C., 2021. SuperVoxHenry: Tucker-enhanced and FFT-accelerated inductance extraction for voxelized superconducting structures. IEEE Transactions on Applied Superconductivity, 31(7), pp.1-11.

[17] S. B. Sayed, Y. Liu, **L. J. Gomez**, A. Yucel, "A Butterfly-Accelerated Volume Integral Equation Solver for Broad Permittivity and Large-Scale Electromagnetic Analysis," *Transactions on Antennas and Propagation*, vol. 70, no. 5, pp. 3549 - 3559, 2022.

[18] Z. Hao, **L. J. Gomez**, and J. Guilleminot, "Uncertainty quantification of TMS simulations considering MRI segmentation errors," *Journal of neural engineering*, vol. 19, no. 2, pp. 1-15, 2022

[19] X. Jia, S. Sayed, *N. Hasan*, **L. Gomez**, G. Huang, A. Yucel., "DeeptDCS: Deep Learning-Based Estimation of Currents Induced During Transcranial Direct Current Stimulation," *IEEE Trans. Biomed. Eng.,* vol. 70, no. 4, pp. 1231 - 1241, 2022.

[20] *D. Wang, H. I. Hasan*, M. Dannhauer, A. C. Yucel and **L. J. Gomez**, "Fast Computational E-field Dosimetry for Transcranial Magnetic Stimulation using Adaptive Cross Approximation and Auxiliary Dipole Method (ACA-ADM)," *NeuroImage*, vol. 267, 2023

[21] *I. Hasan, D. Wang*, and **L. J. Gomez**, " Fast and accurate computational E-field dosimetry for group-level transcranial magnetic stimulation targeting," *Computers in Biology and Medicine*, vol. 167, 2023

[22] M. Dannhauer, **L. J. Gomez**, P. L. Robins, *D. Wang, N. I Hasan*, A. Thielscher, H. R. Siebner, Y. Fan, Z. Deng, " Fast and accurate computational E-field dosimetry for group-level transcranial magnetic stimulation targeting," *Biological Psychiatry*, 2023

Conference Proceedings and Presentations

[1] **L. J. Gomez**, L. Hernandez, A. Grbic, E. Michielssen, "A simulation of focal brain stimulation using metamaterial lenses," IEEE International Symposium on Antennas and Propagation and ITNC-USNC-URSI Radio Science Meeting, July 2010.

[2] F. Cajko, E. Michielssen, **L. J. Gomez**, P. G. Martinsson, L. Hernandez, " A Fast Direct Solver for Transcranial Magnetic Stimulation Analysis," IEEE International Symposium on Antennas and Propagation and ITNC-USNC-URSI Radio Science Meeting, July 2010.

[3] **L. J. Gomez**, L. Hernandez, A. Grbic, E. Michielssen, "Focused multi-coil transcranial magnetic stimulation," IEEE International Symposium on Antennas and Propagation and ITNC-USNC-URSI Radio Science Meeting, July 2011.

[4] F. Cajko, E. Michielssen, **L. J. Gomez**, P. G. Martinsson, L. Hernandez, "A fast direct solver for TMS analysis and design in 3D," IEEE International Symposium on Antennas and Propagation and ITNC-USNC-URSI Radio Science Meeting, July 2011.

[5] **L. J. Gomez**, L. Hernandez, A. Grbic, E. Michielssen, " Single-Source Multi-Coil Transcranial Magnetic Stimulators for Deep and Focused Stimulation of the Human Brain," IEEE International Symposium on Antennas and Propagation and ITNC-USNC-URSI Radio Science Meeting, July 2013.

[6] **L. J. Gomez**, E. Michielssen, " A Well-Conditioned Volume-Surface Field Integral Equation (VSCFIE) for Inhomogeneous Cylindrical Scatterers with High-Electrical Contrasts," IEEE International Symposium on Antennas and Propagation and ITNC-USNC-URSI Radio Science Meeting, July 2013.

[7] **L. J. Gomez**, A. Yucel, L. Hernandez, E. Michielssen, " Uncertainty Quantification in Transcranial Magnetic Stimulation," IEEE International Symposium on Antennas and Propagation and ITNC-USNC-URSI Radio Science Meeting, July 2013.

[8] **L. J. Gomez**, A. Yucel, E. Michielssen, " A Well-Conditioned Volume-Surface Combined Field Integral Equation (VSCFIE) for Inhomogeneous Scatterers with Negative Permittivities," IEEE International Symposium on Antennas and Propagation and ITNC-USNC-URSI Radio Science Meeting, July 2014.

[9] **L. J. Gomez**, A. Yucel, E. Michielssen, " Sensitivity of TMS-Induced Electric Fields to the Uncertainty in Coil Placement and Brain Anatomy," IEEE International Symposium on Antennas and Propagation and ITNC-USNC-URSI Radio Science Meeting, July 2014.

[10] A. Yucel, **L. J. Gomez**, Y. Liu, H. Bagci, E. Michielssen, " A FMM-FFT Accelerated Hybrid Volume Surface Integral Equation Solver for Electromagnetic Analysis of Re-Entry Space Vehicles," IEEE International Symposium on Antennas and Propagation and ITNC-USNC-URSI Radio Science Meeting, July 2014.

[11] A. Yucel, L. J. Gomez , E. Michielssen, "An Internally Combined Volume-Surface Integral Equation for 3D Plasma Scatterers," IEEE International Symposium on Antennas and Propagation and ITNC-USNC-URSI Radio Science Meeting, July 2015.

[12] **L. J. Gomez**, A. Yucel, E. Michielssen, " Low-Frequency Stable Internally Combined Volume-Surface Integral Equation for 3D High-Contrast Scatterers," IEEE International Symposium on Antennas and Propagation and ITNC-USNC-URSI Radio Science Meeting, July 2015.

[13] A. Yucel, **L. J. Gomez**, E. Michielssen, "Tucker Decomposition for Compressing Translation Operator Tensors in FMM-FFT Accelerated SIE Solvers," IEEE International Symposium on Antennas and Propagation and ITNC-USNC-URSI Radio Science Meeting, July 2015.

[14] **L. J. Gomez**, N. Dalal, A. Yucel, R. Villegas, L. Honglak, E. Michielssen, "Deep Learning Augmented Inverse Scattering Algorithm," IEEE International Symposium on Antennas and Propagation and ITNC-USNC-URSI Radio Science Meeting, July 2016.

[15] **L. J. Gomez**, W. Sheng, A. Yucel, E. Michielssen, "Fast Statistical Characterization of Rough Surface Scattering via Tensor Train Decompositions," IEEE International Symposium on Antennas and Propagation and ITNC-USNC-URSI Radio Science Meeting, July 2016.

[16] **L. J. Gomez**, S. Goetz, A. V. Peterchev, " Synthesis of Focal Deep Transcranial Magnetic Stimulation (fdTMS) Coils," NYC Neuromodulation and NANS Summer Series Conference, August 2018.

[17] **L. J. Gomez**, S. Goetz, A. V. Peterchev, "Computational Design of Focal Deep Transcranial Magnetic Stimulation (fdTMS) Coils," 4th Annual BRAIN Initiative Investigators Meeting, April 2018.

[18] **L. J. Gomez**, E. Smith, S. Goetz, A. V. Peterchev, "Transcranial Magnetic Stimulation Coils with Enhanced Focality and Depth (fdTMS)," 4th Annual BRAIN Initiative Investigators Meeting, April 2018.

[19] **L. J. Gomez**, L. M. Koponen, R. Hamdan, S. M. Goetz, and A. V. Peterchev, "Transcranial magnetic stimulation coils with enhanced focality and depth (fdTMS)," 5th Annual BRAIN Initiative Investigators Meeting, April 2019.

[20] M. Wang, C. Qian, Z. Chen, E. di Lorenzo, **L. J. Gomez**, S. Zheng, V. Okhmatovski, A. C. Yucel, “Tucker-Enhanced VoxHenry Simulator for Inductance Extraction of Voxelized Conducting/Superconducting Structures,” IEEE MTT-S International Conference on Numerical Electromagnetic and Multiphysics Modeling and Optimization, May 2019.

[21] **L. J. Gomez**, L. M. Koponen, R. Hamdan, S. Goetz, A. V. Peterchev, " Computationally Designed Focal Deep Transcranial Magnetic Stimulation (fdTMS) Coils," IEEE International Symposium on Antennas and Propagation and ITNC-USNC-URSI Radio Science Meeting, July 2019.

[22] **L. J. Gomez**, A. Yücel, W. Sheng, E. Michielssen, "Fast Surrogate Model-Assisted Uncertainty Quantification via Quantized Tensor Train Decompositions," IEEE International Symposium on Antennas and Propagation and ITNC-USNC-URSI Radio Science Meeting, July 2019.

[23] **L. J. Gomez**, M. Dannhauer, L. M. Koponen, A. V. Peterchev, “Conditions for numerically accurate TMS electric field simulation,” 2019 Carolina Neurostimulation Conference, June 2019.

[24] **L. J. Gomez**, L. M. Koponen, R. Hamdan, A. V. Peterchev, “Transcranial magnetic stimulation coils with enhanced focality and depth (fdTMS),” 6th Annual BRAIN Initiative Investigators Meeting, virtual event, June 2020.

[25] **L. J. Gomez**, M. Dannhauer, A. V. Peterchev, “Uncertainty quantification for accurate and reliable computational dosimetry and targeting for transcranial magnetic stimulation,” 6th Annual BRAIN Initiative Investigators Meeting, virtual meeting, June 2020.

[26] M. Wang, C. Qian, A. C. Yucel, E. Di Lorenzo. **L. J. Gomez**, Z. Chen, S. Zheng, V. Okhmatovski, “An FFT-accelerated and Tucker-enhanced inductance extraction for voxelized superconducting structures," IEEE International Symposium on Antennas and Propagation and ITNC-USNC-URSI Radio Science Meeting, July 2020.

[27] S. B. Sayed, **L. J. Gomez**, A. C. Yucel, “A multi-region internally combined volume surface integral equation for EM analysis of inhomogeneous negative and positive permittivity scatterers," IEEE International Symposium on Antennas and Propagation and ITNC-USNC-URSI Radio Science Meeting, July 2020.

[28] X. Jia, S. B. Sayed, **L. J. Gomez**, N. Dalal, H. Lee, E. Michielssen, G. Huang, A. C. Yucel, "Deep learning augmented inverse scattering algorithms for through-the-wall imaging," IEEE International Symposium on Antennas and Propagation and ITNC-USNC-URSI Radio Science Meeting, July 2020.

[29] **L. J. Gomez**, M. Dannhauer, A. V. Peterchev, "Fast E-field-informed optimum coil placement using electromagnetic reciprocity," IEEE International Symposium on Antennas and Propagation and ITNC-USNC-URSI Radio Science Meeting, July 2020.

[30] Z. Hao, **L. J. Gomez**, J. Guilleminot, "Uncertainty quantification in high-fidelity simulations for transcranial magnetic stimulation," Society of Engineering Science, virtual event, September 2020.

[31] **L. J. Gomez**, L. M. Koponen, R. Hamdan, S. Goetz, A. V. Peterchev, "Computationally-designed Focal Deep Transcranial Magnetic Stimulation (fdTMS) coils," 7th International Conference on Non-invasive Brain Stimulation (NIBS), virtual meeting, Clinincal Neurophysiology 131(4): e111–2, October 2020.

[32] **L. J. Gomez**, M. Dannhauer, A. V. Peterchev, "Fast E-field informed optimum coil placement using reciprocity," 7th International Conference on Non-invasive Brain Stimulation (NIBS),virtual meeting, Clinincal Neurophysiology 131(4): e112–3, October 2020.

[33] **L. J. Gomez**, M. Dannhauer, H. Zhang, D. Wang and J. Guilleminot, "Uncertainty quantification for robust TMS E-field dosimetry," 2021 10th International IEEE EMBS Conference on Neural Engineering, May 2021.

[34] S.B. Sayed, Y. Liu, **L. J. Gomez** and A. C. Yucel, "A Butterfly-Accelerated Volume Integral Equation Solver for Large-Scale Electromagnetic Analysis," 2021 International Applied Computational Electromagnetics Society Symposium (ACES) , pp. 1-3), August 2021.

[35] D. Wang, M. Dannhauer, A. C. Yucel, **L. J. Gomez**, "Adaptive Cross Approximation for E-field-Guided Noninvasive Magnetic Brain Stimulation," 2021 International Applied Computational Electromagnetics Society Symposium (ACES) , pp. 1-3), August 2021.

[36] D. Wang, N. I. Hasan, **L. J. Gomez**, "Fast E-field Simulation in the Transcranial Magnetic Stimulation Using Adaptive Cross Approximation," IEEE International Symposium on Antennas and Propagation and ITNC-USNC-URSI Radio Science Meeting, Dec 2021.

[37] N. I. Hasan, D. Wang, **L. J. Gomez**, "Virtual Head Model Embedding for Population-Based Uncertainty Quantification," IEEE International Symposium on Antennas and Propagation and ITNC-USNC-URSI Radio Science Meeting, Dec 2021.

[38] X. Jia, S. B. Sayed, G. Huang, A. C. Yucel, **L. J. Gomez** "DeeptDCS: Real-Time Estimation of Currents Induced During Transcranial Direct Current Stimulation via Deep Learning," IEEE International Symposium on Antennas and Propagation and ITNC-USNC-URSI Radio Science Meeting, Dec 2021.

[39] **L. J. Gomez**, L. Koponen, R. Hamdan, S. Goetz, A. V. Peterchev "Practical TMS coils with maximum focality and various stimulation depths," Brain Stimulation: Basic, Translational, and Clinical Research in Neuromodulation, Dec 2021.

[40] A. V. Peterchev, L. Koponen, **L. J. Gomez**, Z. Zeng, R. Hamdan, E. Wood, M. Dannhauer, Z. Li, G. Appelbaum, D. Murphy "How focal and quiet can TMS be?," Brain Stimulation: Basic, Translational, and Clinical Research in Neuromodulation, Dec 2021.

[41] H. Zhang, J. Guilleminot, **L. J. Gomez**, "Uncertainty quantification of TMS simulation considering MRI segmentation error," Brain Stimulation: Basic, Translational, and Clinical Research in Neuromodulation, Dec 2021.

[42] D. Wang, M. Dannhauer, A. C. Yucel, **L. J. Gomez**, "Adaptive Cross Approximation for E-field-Guided Noninvasive Magnetic Brain Stimulation," Brain Stimulation: Basic, Translational, and Clinical Research in Neuromodulation, Dec 2021.

[43] D. Wang, N. I. Hasan, D. Czerwonky, **L. J. Gomez**, "Modeling of the Meninges as a Boundary Condition in Computational E-field dosimetry," IEEE International Symposium on Antennas and Propagation and ITNC-USNC-URSI Radio Science Meeting, July 2022.

[44] N. I. Hasan, **L. J. Gomez**, “Synthetic 2D Segmented Virtual Head Model Generation Using Generative Adversarial Network (GAN) for Population-Based E-field Dosimetry Estimation and Uncertainty Quantification,” IEEE International Symposium on Antennas and Propagation and ITNC-USNC-URSI Radio Science Meeting, July 2022.

[45] N. I. Hasan, D. Wang, **L. J. Gomez**, “Optimal Population Level Transcranial Magnetic Stimulation via Probabilistic Matrix Decomposition,” IEEE International Symposium on Antennas and Propagation and ITNC-USNC-URSI Radio Science Meeting, July 2022.

[46] D. Wang, N. I. Hasan, **L. J. Gomez**, “Benchmarking Transcranial Magnetic Stimulation (TMS) coils in terms of their induced E-field in Realistic MRI-derived Head Models,” IEEE International Symposium on Antennas and Propagation and ITNC-USNC-URSI Radio Science Meeting, July 2022.

[47] D. Wang, N. I. Hasan, **L. J. Gomez**, “Uncertainty quantification of TMS simulations considering MRI segmentation errors,” IEEE International Symposium on Antennas and Propagation and ITNC-USNC-URSI Radio Science Meeting, July 2022.

[48] **L. J. Gomez**, *D. Wang*, M. Dannhauer, H. Zhang, J. Guilleminot, A. C. Yucel, “Accurate and reliable computational dosimetry and targeting for transcranial magnetic stimulation via uncertainty quantification,” Brain Stimulation: Basic, Translational, and Clinical Research in Neuromodulation, Feb 2023.

[49] *N. I. Hasan, D. Wang*, **L. J. Gomez**, “Fast solvers for population-level optimization and uncertainty quantification in transcranial magnetic stimulation (TMS),” Brain Stimulation: Basic, Translational, and Clinical Research in Neuromodulation, Feb 2023.

[50] D. Murphy, **L. J. Gomez**, R. Hamdan, Y. Li, E. Wood, L. Koponen, M. Dannhauer, S. Goetz, A. Peterchev, “Experimental demonstration of transcranial magnetic stimulation coils with optimized focality,” Brain Stimulation: Basic, Translational, and Clinical Research in Neuromodulation, Feb 2023.

[51] *D. Wang, N. I. Hasan*, **L. J. Gomez**, “Fast computational dosimetry of transcranial electric stimulation using probabilistic matrix decomposition,” International Applied Computational Electromagnetics Society (ACES) Symposium, Mar 2023.

[52] *D.M. Czerwonky*, **L.J. Gomez**, "Integral Equation for Analyzing Neuron Response to Non-invasive Electromagnetic Brain Stimulation," 2023 International Applied Computational Electromagnetics Society Symposium (ACES), IEEE, March 2023 (BEST STUDENT PAPER AWARD).

[53] *D.M. Czerwonky*, **L.J. Gomez**, "Integral equation for analyzing cell's response to device E-fields," 2023 IEEE MTT-S International Conference on Numerical Electromagnetic and Multiphysics Modeling and Optimization (NEMO), June 2023 (INVITED).

[54] **L.J. Gomez**, *D.M. Czerwonky*, "Integral Equation for Analyzing Neuron Cell Response to Transcranial Magnetic Stimulation," URSI International Symposium on Electromagnetic Theory 2023, May 2023 (INVITED).

[55] *D. Wang, N. I. Hasan*, **L. J. Gomez**, "Fast E-field determination of transcranial electric stimulation using probabilistic matrix decomposition," Antennas and Propagation Society International Symposium (APSURSI), July 2023.

[56] X. Wang, Q. Xu, X. Jia, **L. J. Gomez**, A. C. Yucel, "Uncertainty Quantification of the tDCS-Induced Electric Fields Subjected to Inter-Subject and Inter-Session Variabilities," Antennas and Propagation Society International Symposium (APSURSI), July 2023.

[57] *N. I. Hasan, D. Wang*, L. J. Gomez, "Real-Time E-Field Dosimetry Estimation in Transcranial Magnetic Stimulation via Probabilistic Matrix Decomposition (PMD) and Huygens' Principle," Antennas and Propagation Society International Symposium (APSURSI), July 2023.

[58] *N. I. Hasan, D. Wang*, L. J. Gomez, "Application of Fast E-Field Solvers in Developing Individualized Optimal Transcranial Magnetic Stimulation and Population-level Uncertainty Quantification," Antennas and Propagation Society International Symposium (APSURSI), July 2023.

[59] *D.M. Czerwonky*, L.J. Gomez, "Integral Equation for neuron response analysis to non-invasive electromagnetic brain stimulation," 2023 IEEE International Symposium on Antennas and Propagation and USNC-URSI Radio Science Meeting (AP-S/URSI), July 2023.

[60] *D.M. Czerwonky*, L.J. Gomez, "Integral Equation for Analyzing Neuron Response to Non-invasive Electromagnetic Brain Stimulation," 2023 Brain and Human Body Modeling Conference (BHBM), August 2023.

[61] N. I. Hasan, D. Wang, L. J. Gomez, “Application of Fast E-Field Solvers in Developing Individualized Optimal Transcranial Magnetic Stimulation,” Brain and Human Body Modeling Conference, August 2023.

[62] L. J. Gomez, H. Zhang, J. Guilleminot, “Uncertainty quantification of TMS simulations considering MRI segmentation errors,” Brain and Human Body Modeling Conference, August 2023.

Invited Lectures

[1] “Computational Electromagnetics Enables Personalized Medicine: A Case Study in Transcranial Magnetic Stimulation,” UCLA, Los Angeles, CA (April 2016)

[2] “Computational Electromagnetics Enables Personalized Medicine: A Case Study in Transcranial Magnetic Stimulation” Michigan State University, East Lansing, MI (February 2016)

[3] “Computational Electromagnetics Enables Personalized Medicine: A Case Study in Transcranial Magnetic Stimulation” Duke University, Durham, NC (October 2019)

[4] “Computational Electromagnetics Enables Personalized Medicine: A Case Study in Transcranial Magnetic Stimulation” Purdue University, West Lafayette, IN (January 2020)

[5] “Computational Electromagnetics Enables Personalized Medicine: A Case Study in Transcranial Magnetic Stimulation” University of Illinois Chicago, Chicago, Il (May 2020)

[6] “Improving the precision and targeting of Transcranial Magnetic Stimulation” Neuroscience 2020 under the NIH BRAIN Initiative: A Multidisciplinary Approach to Neuroscience track, Labroots virtual conference (2020)

[7] “Improving the precision and targeting of Transcranial Magnetic Stimulation” Computational Modeling in Non-Invasive Brain Stimulation (NIBS) Workshop, University of Minnesota, (Virtual meeting May 2020)

[8] “Computational Electromagnetics tools for improving and studying TMS targeting” ECE seminar series, Purdue University, (May 2022)

[9] “Computational Electromagnetics tools for improving and studying TMS targeting” ECE speaker series, University of Houston, (Feb 2023)

[10] “Computational Methods for Analysis of Brain Stimulation and Signals” Short Course, Applied Computational Electromagnetics Society Conference (ACES), Monterey, California, (March 2023)

[11] “Integral equation for analyzing neuron cell response to Transcranial Magnetic Stimulation” URSI/EMTS Conference, Vancouver, Canada, (May 2023)

[12] “Accurate and reliable computational dosimetry and targeting for transcranial magnetic stimulation via uncertainty quantification” Computational Modeling in Non-Invasive Brain Stimulation (NIBS) Workshop, University of Minnesota, (May 2023)

Pending Publications

[1] *N. I. Hasan*, M. Dannhauer, *D. Wang*, Z. Deng, and **L. J. Gomez**, " Real-Time Computation of Brain E-Field for Enhanced Transcranial Magnetic Stimulation Neuronavigation and Optimization," *Imaging Neuroscience Journal,* **In review**.

[2] **L. J. Gomez**, L. M. Koponen, R. Hamdan, R. Li, D. L. K. Murphy, S. M. Goetz, A. V. Peterchev, " Practical TMS coils with maximum focality and various stimulation depths," *Journal of Neural Engineering,* **In review**.

[3] *D. Czerwonky*, A. Aberra, and **L. J. Gomez**, "Integral Equation for neuron response analysis to non-invasive electromagnetic brain stimulation," *Journal of Neural Engineering,* **In review**.

[4] N. Goswami, M. Shen, **L. J. Gomez**, M. Dannhauer, M. A. Sommer, A. V. Peterchev, "A semi-automated pipeline for finite element modeling of induced electric field in nonhuman primates by transcranial magnetic stimulation," *Journal of Neuroscience Methods,* **In review**.

Patents Approved and Patent Applications

[1] Luis Hernandez-Garcia, Anthony Grbic, Eric Michielssen, and Luis Gomez, "Multi-coil transcranial magnetic stimulation," U. S. Patent No. 9,744,373, August 29, 2017.

Activities as a Referee

Associate Editor, IEEE Journal on Electromagnetics, RF, and Microwaves in Medicine and Biology
Reviewer, IEEE Transactions on Antennas and Propagation
Reviewer, IEEE Antennas and Wireless Propagation Letters
Reviewer, Brain Stimulation Journal
Reviewer, NeuroImage Journal
Reviewer, Imaging Neuroscience Journal
Reviewer, Journal of Neural Engineering
Reviewer, IEEE Transactions on Biomedical Engineering
Reviewer, PLOS ONE
Reviewer, Medical Physics