

CURRICULUM VITAE

ERGUN SIMSEK

Assistant Professor

Department of Computer Science and Electrical Engineering (CSEE)

University of Maryland Baltimore County (UMBC)

1000 Hilltop Circle, ITE Building, Room 325K, Baltimore, MD 21250

simsek@umbc.edu | +1 (410) 455-3540

<https://userpages.cs.umbc.edu/simsek/> | <https://github.com/simsekergun/>

EDUCATION

Ph.D. 2006 Electrical and Computer Engineering, Duke University. Advisor: Prof. Qing H. Liu. Dissertation: "Electromagnetic Scattering from Inhomogeneous Objects of Arbitrary Shape Embedded in a Layered Medium."

M.S. 2003 Electrical and Computer Engineering, University of Massachusetts Dartmouth. Advisor: Prof. Branislav M. Notaros. Thesis: "Evaluation of Closed-form Green's Functions for Multilayer Microstrip Antennas and Circuits."

B.S. 2001 Electrical and Electronics Engineering, Bilkent University, Ankara, Turkey.

Experience in Higher Education

8/2022 - present Assistant Professor, Computer Science and Electrical Engineering, UMBC

11/2018 - 08/2025 Director, Graduate Data Science Programs, CSEE, UMBC

11/2018 - 08/2022 Professor of the Practice, CSEE, UMBC

09/2011 - 05/2017 Assistant Professor of Electrical and Computer Engineering, George Washington University (Washington, D.C.)

02/2011 - 08/2011 Associate Professor of Electrical and Electronics Engineering, Bahcesehir University

09/2008 - 01/2011 Assistant Professor of Electrical and Electronics Engineering, Bahcesehir University

Experience in Other than Higher Education

05/2017 - 11/2018 Manager, Exponent Inc., Washington, D.C.

06/2014 - 08/2014 Visiting Summer Fellow, Naval Research Laboratory, Washington, D.C.

01/2007 - 08/2008 Post-Doctoral Research Associate, Schlumberger-Doll Research, Cambridge, MA. Advisors: Dr. Bikash Sinha (SDR) and Prof. Kenneth Crozier (Harvard)

HONORS RECEIVED

2022 Senior Member, OPTICA

2013 Invited participant, NAE-sponsored Frontiers of Engineering Education Symposium

2013 Professor of the Year Award, given by GW Electrical and Computer Engineering students

2012 Senior Member, IEEE

2008-2011 Marie Curie Fellow

2009 TUBITAK 7th Framework Participation Award

2006 Duke University Conference Travel Fellowship

2003-2006 Research Assistantship, Duke University

2001-2003 Teaching Assistantship, University of Massachusetts Dartmouth

1996-2001 Full scholarship, Bilkent University

1996 Ranked 5th nationwide among 1.5 million students on the Turkish Student Selection Examination; full scholarship awarded by the Turkish Government for undergraduate study abroad

RESEARCH SUPPORT AND/OR FELLOWSHIPS

Grants (Funded)

2024 - 2025 \$246,000 (UMBC budget), Department of Defense, HBCU/MI Research and Education Program (W911NF-23-S-0014), PI - “Advancing Photodetector Thermal Characterization through Time-Domain Thermo-Reflectance and Machine Learning”

2023 \$60,000 (UMBC budget), DoD/Department of the Air Force, STTR Phase I (Topic AF23C-T002), PI (Co-PIs: Curtis R. Menyuk, Gary M. Carter); subcontract via Phase Sensitive Innovations Inc. - “Modeling and Characterization of Modulators for Frequency-Comb Generation”

2024-2025 \$19,955, UMBC COEIT Interdisciplinary Proposals Program, Co-PI (with Ozgur Capraz, CBEE) - “Substrate and Defect Engineering for More Efficient Photovoltaic Systems”

2025 \$17,100, UMBC COEIT Research Lab Equipment and Facilities Fund (FY25) - “Acquisition of a high-end workstation”

2023-2024 \$3,494, Hrabowski Innovation Fund Competition, PI - “Course Planning with Machine Learning”

2016-2019 \$327,246 (total), National Science Foundation (Award No. NSF ECCS 16-10390), Co-PI - “Catastrophic Impacts of Geomagnetic Disturbances on Power System Operation: Analysis and Mitigation”

2010-2012 \$110,000, The Scientific and Technological Research Council of Turkey (TUBITAK, Award No. 110E269), PI (single-investigator grant) - “Numerical Solution of Electromagnetic Scattering from Three-Dimensional Arbitrarily Shaped Objects Embedded in a Multilayered Medium”

2009-2012 €100,000, European Commission Seventh Framework Programme, Marie Curie Grant (Award No. PIRG-GA-2009-247876), PI (single-investigator grant) - “Novel Numerical Algorithms for Plasmonic Structures Embedded in a Layered Medium”

2010-2011 \$23,300, TUBITAK (Award No. 110E002), PI (single-investigator grant) - “Plasmonic Resonant Modes of Cylindrical Metal Nanoparticles”

2011-2012 \$250,000, Seed Award, George Washington University - “Computational and Applied Photonics & Electromagnetics (CAPE) Lab”

2009 \$19,200, Seed Award, Bahcesehir University Research Foundation, PI - “Plasmonic Sensors”

Proposals Submitted (Pending)

2026 \$941,329.00, Army DEVCOM, Transformation Decision Analysis Center (TDAC), Co-PI (PI: Curtis R. Menyuk, Co-PI: Jianwu Wang) - “Simulation, Machine Learning, and Reduced Order Modeling of Ultra-Short Pulsed Lasers”

2026 \$?, DARPA RF Architectures Applying Photonic Timing and Routing (RAAPTR), Subcontractor (Lead: Menlo Systems) - “Noise modeling of the mode-locked combs: AM/PM, chip, and fiber”

PH.D. STUDENTS

UMBC

- Ishraq Md Anjum, PhD defended 06/02/2026 (Co-Advisor with Dr. Curtis R. Menyuk)
- Raonaqul Islam, expected to graduate in December 2026 (Advisor).
- Nicholas Pankow (Co-Advisor with Dr. Gary Carter)

George Washington University

- Reid McCargar (currently works at Lockheed Martin as a Principal Research Scientist)
- Can Suer (currently works at Medtronic as a Senior Electrical Engineer)
- Reza Karimian Bahnemiri (currently works at Teltrium as a Senior Researcher)

MASTER'S STUDENTS

- at UMBC: Supervised 127 DATA 606 Capstone in Data Science projects, 2018-2025, Advisor. With Harish Manyam, we published two journal and four conference papers.
- at The George Washington University: Zhizhen Ma, Isil Ogut, and Can Suer, 2011-2013, Advisor

- at Bahcesehir University: Mehmet Bay, Dilek Bolat, and Tolga Aydogan, 2009-2011, Advisor

UNDERGRADUATE STUDENTS

UMBC

- Isabella Morgan (CRA-WP Distributed Research Experiences for Undergraduates (DREU) program, \$9K)
- Asher Banwo (Meyerhoff Summer FOCUS 2026)
- Harel Lendo (supported by the QSI Undergraduate Research Program)
- Rebecca Mekasha (Summer Student Project award, \$5k)
- Ethan Rizzutti, William Truiite, and Abhinna Das (TDTR setup)
- Ashwin Gopalaswami (Silvaco simulations of high bandwidth MUTC photodetectors)
- Emmanuel Moses (worked on Si-Ge photodetector design in Summer 2025 within Meyerhoff Scholars program)
- Emerson Cho (worked on enhancing the resolution with machine learning. We published one journal and two conference papers)

George Washington University

- Jack Ferrell, Daniel Oler, and Shea Metzhar, research mentees, 2015-2016
- Jessica Emma Thomson, research mentee, Fall 2015
- Pedro Strepeckes, Pedro Canelada, and Francisco Nakao (international undergraduate researchers), research mentees, Summer 2015
- Aaron Williams and Mark Tentindo Williams, research mentees, Summer 2013

Bahcesehir University (Istanbul, Turkey)

- Can Boran Akdal, research mentee, Spring 2011
- Gokhan Barlak, research mentee, Fall 2010
- Baris Sonmez, research mentee, Fall 2010

POST-DOCTORAL RESEARCH ASSOCIATES

- Dr. Bablu Mukherjee, The George Washington University, 03/2014-08/2015

PUBLICATIONS, PRESENTATIONS, AND CREATIVE ACHIEVEMENTS

PUBLICATIONS

Peer-Reviewed Works (Underlines indicate the primary author)

Articles (*h-index* = 20, *i10-index* = 39, total citations = 1,924; Google Scholar: <https://scholar.google.com/citations?user=o30tR0QgLaUC&hl=en>)

1. Ergun Simsek, Shao-Chien Ou, Gregory Moille, and Kartik Srinivasan, "Microring Resonator Dispersion Metrology with Neural Networks," accepted for publication in *Nanophotonics*, August 2026.
2. Ergun Simsek, "Accuracy and Computational Cost of Machine Learning Models for Electromagnetic Object Classification," *IEEE Open Journal of Antennas and Propagation*, pp. 1-9 (2026).
3. Ergun Simsek, Sumya H Oishe, "A multi-objective permittivity optimization for object classification at the speed of light," *Machine Learning: Science and Technology*, vol. 6, no. 045014 (2025).
4. Ergun Simsek, Alioune Niang, Raonaqul Islam, Logan Courtright, Pradyoth Shandilya, Gary M. Carter, Curtis R. Menyuk, "A mixed-field formulation for modeling dielectric ring resonators and its application in optical frequency comb generation," *Scientific Reports*, vol. 15, no. 1, pp. 35098 (2025).
5. Ergun Simsek, "Practical vectorial mode solver for dielectric waveguides based on finite differences," *Optics Letters*, vol. 50, no. 12, pp. 4102-4105 (2025).
6. Raonaqul Islam, Ishraq Md. Anjum, Curtis R. Menyuk, Ergun Simsek, "2D material-based plasmonic phototransistors under strong optical excitations," *Journal of Computational Electronics*, vol. 24, no. 4, pp. 104 (2025).

7. Ishraq Md Anjum, Ergun Simsek, Seyed Ehsan Jamali Mahabadi, Thomas F. Carruthers, Curtis R. Menyuk, Joe C. Campbell, David A. Tulchinsky, Keith J. Williams, "Sources of nonlinearity and mitigation of phase noise in MUTC photodetectors at comb-line frequencies," *Optics Express*, vol. 33, no. 11, pp. 24130-24140 (2025).
8. Raonaqul Islam, Ishraq Md. Anjum, Curtis R. Menyuk, Ergun Simsek, "Study of an MoS₂ phototransistor using a compact numerical method enabling detailed analysis of 2D material phototransistors," *Scientific Reports*, vol. 14, no. 1, pp. 15269 (2024).
9. Ergun Simsek, Harish Reddy Manyam, "Classification with electromagnetic waves," *IET Microwaves, Antennas & Propagation*, vol. 18, no. 12, pp. 898-910 (2024).
10. Ergun Simsek, Raonaqul Islam, Sumya H. Oishe, Curtis R. Menyuk, "Substrate optimization with the adjoint method and layered medium Green's functions," *Journal of the Optical Society of America B*, vol. 41, no. 10, pp. 2259-2265 (2024).
11. Emerson K. Cho and Ergun Simsek, "Enhancing the Resolution of Local Near-Field Probing Measurements With Machine Learning," *IEEE Transactions on Microwave Theory and Techniques*, vol. 72, no. 3, pp. 1515-1519 (2024).
12. Ergun Simsek, Alexander S. Hastings, David A. Tulchinsky, Keith J. Williams, Curtis R. Menyuk, "A Simple Numerical Model to Estimate the Temperature Distributions Over Photodetectors in Steady-State," *IEEE Photonics Journal*, vol. 16, no. 3, pp. 1-6 (2024).
13. Ergun Simsek, Ishraq Md Anjum, Thomas F. Carruthers, Curtis R. Menyuk, Joe C. Campbell, David A. Tulchinsky, Keith J. Williams, "Fast Evaluation of RF Power Spectrum of Photodetectors With Windowing Functions," *IEEE Transactions on Electron Devices*, vol. 70, no. 7, pp. 3643-3648 (2023).
14. Masoud Soroush, Ergun Simsek, Gregory Moille, Kartik Srinivasan, Curtis R. Menyuk, "Predicting Broadband Resonator-Waveguide Coupling for Microresonator Frequency Combs through Fully Connected and Recurrent Neural Networks and Attention Mechanism," *ACS Photonics*, vol. 10, no. 6, pp. 1795-1805 (2023).
15. Ishraq Md Anjum, Ergun Simsek, Seyed Ehsan Jamali Mahabadi, Thomas F. Carruthers, Curtis R. Menyuk, Joe C. Campbell, David A. Tulchinsky, Keith J. Williams, "Use of Evolutionary Optimization Algorithms for the Design and Analysis of Low Bias, Low Phase Noise Photodetectors," *Journal of Lightwave Technology*, vol. 41, no. 23, pp. 7285-7291 (2023).
16. Ergun Simsek, "Machine Learning Exercises on 1-D Electromagnetic Inversion," *IEEE Transactions on Antennas and Propagation*, vol. 69, no. 10, pp. 6797-6805 (2021).
17. Ergun Simsek, "Determining optical constants of 2D materials with neural networks from multi-angle reflectometry data," *Machine Learning: Science and Technology*, vol. 1, no. 1, pp. 01LT01 (2020).
18. Bablu Mukherjee, N. Kaushik, Ravi P. N. Tripathi, A. M. Joseph, P. K. Mohapatra, S. Dhar, B. P. Singh, G. V. Pavan Kumar, Ergun Simsek, S. Lodha, "Exciton Emission Intensity Modulation of Monolayer MoS₂ via Au Plasmon Coupling," *Scientific Reports*, vol. 7, no. 1, pp. 41175 (2017).
19. Bablu Mukherjee, Ergun Simsek, "Utilization of monolayer MoS₂ in Bragg stacks and metamaterial structures as broadband absorbers," *Optics Communications*, vol. 369, pp. 89-93 (2016).
20. Bablu Mukherjee, Ergun Simsek, "Plasmonics Enhanced Average Broadband Absorption of Monolayer MoS₂," *Plasmonics*, vol. 11, no. 1, pp. 285-289 (2016).
21. Frank Tseng, Ergun Simsek, Daniel Gunlycke, "Using dark states for exciton storage in transition-metal dichalcogenides," *Journal of Physics: Condensed Matter*, vol. 28, no. 3, pp. 034005 (2016).
22. Bablu Mukherjee, Asim Guchhait, Yinthai Chan, Ergun Simsek, "Absorptance of PbS Quantum Dots Thin Film Deposited On Trilayer MoS₂," *Advanced Materials Letters*, vol. 6, no. 11, pp. 936-940 (2015).
23. Bablu Mukherjee, Wei Sun Leong, Yida Li, Hao Gong, Linfeng Sun, Ze Xiang Shen, Ergun Simsek, John T L Thong, "Raman analysis of gold on WSe₂ single crystal film," *Materials Research Express*, vol. 2, no. 6, pp. 065009 (2015).
24. Ergun Simsek, Bablu Mukherjee, "Visibility of atomically-thin layered materials buried in silicon dioxide," *Nanotechnology*, vol. 26, no. 45, pp. 455701 (2015).
25. Bablu Mukherjee, Frank Tseng, Daniel Gunlycke, Kiran Kumar Amara, Goki Eda, Ergun Simsek, "Complex electrical permittivity of the monolayer molybdenum disulfide (MoS₂) in near UV and visible," *Optical Materials Express*, vol. 5, no. 2, pp. 447-455 (2015).
26. Chenran Ye, Sikandar Khan, Zhuo Ran Li, Ergun Simsek, Volker J. Sorger, " λ -Size ITO and Graphene-Based Electro-Optic Modulators on SOI," *IEEE Journal of Selected Topics in Quantum Electronics*, vol. 20, no. 4, pp. 40-49 (2014).

27. Ramazan Sahin, Selcuk Akturk, Ergun Simsek, "Quantifying the quality of femtosecond laser ablation of graphene," *Applied Physics A*, vol. 116, no. 2, pp. 555-560 (2014).
28. R. Sahin, Ergun Simsek, Selcuk Akturk, "Nanoscale patterning of graphene through femtosecond laser ablation," *Applied Physics Letters*, vol. 104, no. 5, pp. 053118 (2014).
29. Ramazan Sahin, Yagiz Morova, Ergun Simsek, Selcuk Akturk, "Bessel-beam-written nanoslit arrays and characterization of their optical response," *Applied Physics Letters*, vol. 102, no. 19, pp. 193106 (2013).
30. Ergun Simsek, "Graphene in Layered Medium Applications," *Microwave and Optical Technology Letters*, vol. 55, no. 10, pp. 2293-2296 (2013).
31. Ergun Simsek, "Improving Tuning Range and Sensitivity of Localized SPR Sensors With Graphene," *IEEE Photonics Technology Letters*, vol. 25, no. 9, pp. 867-870 (2013).
32. Ergun Simsek, "A closed-form approximate expression for the optical conductivity of graphene," *Optics Letters*, vol. 38, no. 9, pp. 1437-1439 (2013).
33. Ergun Simsek, Selcuk Akturk, "Plasmonic Enhancement During Femtosecond Laser Drilling of Sub-wavelength Holes in Metals," *Plasmonics*, vol. 6, no. 4, pp. 767-772 (2011).
34. Ergun Simsek, "Full analytical model for obtaining surface plasmon resonance modes," *Optics Express*, vol. 18, no. 2, pp. 1722-1733 (2010).
35. Bikash K. Sinha, Ergun Simsek, Sergey Asvadurov, "Influence of a pipe tool on borehole modes," *Geophysics*, vol. 74, no. 3, pp. E111-E123 (2009).
36. Ergun Simsek, "On the Surface Plasmon Resonance Modes of Metal Nanoparticle Chains and Arrays," *Plasmonics*, vol. 4, no. 3, pp. 223-230 (2009).
37. Qing Huo Liu, Yun Lin, Jianguo Liu, Joon-Ho Lee, Ergun Simsek, "A 3-D Spectral Integral Method (SIM) for Surface Integral Equations," *IEEE Microwave and Wireless Components Letters*, vol. 19, no. 2, pp. 62-64 (2009).
38. Ergun Simsek, Bikash K. Sinha, "Analysis of noncircular fluid-filled boreholes in elastic formations using a perturbation model," *The Journal of the Acoustical Society of America*, vol. 124, no. 1, pp. 213-217 (2008).
39. Kenneth B. Crozier, Emre Togan, Ergun Simsek, Tian Yang, "Experimental measurement of the dispersion relations of the surface plasmon modes of metal nanoparticle chains," *Optics Express*, vol. 15, no. 26, pp. 17482-17493 (2007).
40. Baojun Wei, Ergun Simsek, Qing Huo Liu, "Improved diagonal tensor approximation (DTA) and hybrid DTA/BCGS-FFT method for accurate simulation of 3D inhomogeneous objects in layered media," *Waves in Random and Complex Media*, vol. 17, no. 1, pp. 55-66 (2007).
41. Baojun Wei, Ergun Simsek, Chun Yu, Qing Huo Liu, "Three-dimensional electromagnetic nonlinear inversion in layered media by a hybrid diagonal tensor approximation: Stabilized biconjugate gradient fast Fourier transform method," *Waves in Random and Complex Media*, vol. 17, no. 2, pp. 129-147 (2007).
42. Bikash K. Sinha, Ergun Simsek, Qing-Huo Liu, "Elastic-wave propagation in deviated wells in anisotropic formations," *Geophysics*, vol. 71, no. 6, pp. D191-D202 (2006).
43. Ergun Simsek, Jianguo Liu, Qing Huo Liu, "A Spectral Integral Method and Hybrid SIM/FEM for Layered Media," *IEEE Transactions on Microwave Theory and Techniques*, vol. 54, no. 11, pp. 3878-3884 (2006).
44. Ergun Simsek, Jianguo Liu, Qing Huo Liu, "A spectral Integral method (SIM) for layered media," *IEEE Transactions on Antennas and Propagation*, vol. 54, no. 6, pp. 1742-1749 (2006).
45. Ergun Simsek, Qing Huo Liu, Baojun Wei, "Singularity subtraction for evaluation of Green's functions for multilayer media," *IEEE Transactions on Microwave Theory and Techniques*, vol. 54, no. 1, pp. 216-225 (2006).
46. Lin-Ping Song, Ergun Simsek, Qing H. Liu, "A fast 2D volume integral-equation solver for scattering from inhomogeneous objects in layered media," *Microwave and Optical Technology Letters*, vol. 47, no. 2, pp. 128-134 (2005).

Works Submitted or In Preparation

Articles (under review):

- Ergun Simsek, "Two Complementary Approaches to Determine the Effective Index of Dielectric Ring Resonators," submitted to *Optics Letters*, July 2026.

- S. Kim et al., “On the Limits and Opportunities of AI Reviewers: Reviewing the Reviews of Nature Journal Papers with 45 Expert Scientists,” submitted to *Nature Human Behaviour*, July 2026.

Articles (in preparation):

- Raonaqul Islam et al., “Self-Trapping of Solitons using Feedback-Controlled Phase Modulation,” to be submitted in late 2026.
- Ishraq M. Anjum, E. Simsek, S. E. Jamali Mahabadi, T. F. Carruthers, C. R. Menyuk, J. C. Campbell, D. A. Tulchinsky, K. J. Williams, “Multiphysics Modeling Frameworks for Photodetectors: Quasi-adiabatic Dynamics Under Ultrashort Optical Pulses,” to be submitted in mid 2026.
- Ergun Simsek, Lynda E. Busse, Leslie B. Shaw, Jesse A. Frantz, and Curtis R. Menyuk, “Optimized GaAs Moth-Eye Frustum Arrays for Broadband Anti-Reflection from Visible to Near-Infrared,” to be submitted in late 2026.

PRESENTATIONS

Conference/Poster Presentations (Juried/Refereed) - under review:

- R. Islam et al., “A Self-Stabilized Master-Slave Architecture for Chip-Scale Dual Frequency Combs,” submitted to SPIE Photonics West, 30 January - 4 February, 2027 San Francisco, California, USA.
- E. Simsek, S.-C. Ou, G. Moille, and K. Srinivasan, “Inferring Microring Cross-Section Geometry from Integrated Dispersion Measurement with Machine Learning,” submitted to IEEE Photonics Conference, November 8-12, 2026, Denver, Colorado, USA.

Conference Presentations (Juried/Refereed)

Oral Presentations (Underlines indicate the presenter):

1. I. M. Anjum, E. Simsek, S. E. Jamali Mahabadi, T. F. Carruthers, and C. R. Menyuk, “A Quasi-One-Dimensional Electro-Opto-Thermal Drift-Diffusion Model: Quantum Efficiency in MUTC Photodetectors,” Optica Advanced Photonics Congress. 26 - 30 July 2026. Long Beach, CA, United States. DOI will be added later.
2. L. Courtright, A. Niang, P. Hedlesky, P. O'Mullan, E. Simsek, G. Carter, J. Eakin, T. Mahmood, J. Cahill, W. Zhou, D. Petkie, C.R. Menyuk, “Design and Characterization of Thick Silicon Nitride Microresonators from AIM Photonics,” 2026 IEEE Research and Applications of Photonics in Defense Conference (RAPID), August 5–7, 2026, Miramar Beach, FL, United States. DOI will be added later.
3. E. Simsek, R. Islam, S.-C. Ou, G. Moille, and K. Srinivasan, “Dispersion Metrology with Neural Networks,” SPIE Optics and Photonics 2026, San Diego, CA, August 23-27, 2026. DOI will be added later.
4. R. Islam, Q. H. Liu, and E. Simsek, “Predicting Plasmonic Enhancement of Luminescence with the FDTD Method,” SPIE Optics and Photonics 2026, San Diego, CA, August 23-27, 2026. DOI will be added later.
5. E. Simsek, S.-C. Ou, G. Moille, and K. Srinivasan, “Dimensional Metrology for Microcombs with Neural Networks,” CLEO 2026, Charlotte, NC, May 17-21, 2026. DOI will be added later.
6. E. Simsek, P. Shandilya, R. Islam, S. Akter, and C. R. Menyuk, “Long-Wave Infrared Frequency Comb Generator for Chemical Agent and Explosive Precursor Detection,” Chemical, Biological, Radiological, Nuclear, and Explosives (CBRNE) Sensing XXVII as a part of the SPIE Defense + Security Meeting, National Harbor, MD, 27 - 30 April 2026. DOI: 10.1117/12.3094714
7. E. Simsek, A. Niang, R. P. Shandilya, Islam, L. Courtright, G. M. Carter, and C. R. Menyuk, “One-Stop-Shop for Modeling Optical Frequency Comb Generation,” 26th International Conference on Electromagnetics in Advanced Applications (ICEAA 2025), Palermo, Italy, September 8-12, 2025. DOI: 10.1109/ICEAA65662.2025.11305975
8. E. Simsek and H. R. Manyam, “Improving object classification accuracy from electromagnetic data using attention mechanisms,” 26th International Conference on Electromagnetics in Advanced Applications (ICEAA 2025), Palermo, Italy, September 8-12, 2025. DOI: 10.1109/ICEAA65662.2025.11305757
9. C. R. Menyuk, L. Courtright, A. Niang, E. Simsek, G. M. Carter, “Microresonator Frequency Comb Implementations in Photonic Integrated Circuits for PNT,” IEEE International Midwest Symposium on Circuits and Systems, Lansing, MI, USA, Aug. 10-13, 2025. DOI: 10.1109/MWSCAS53549.2025.11244451
10. E. Simsek, S. H. Oishe, and R. Islam, “Adjoint Method Supported Topology Optimization for Electromagnetic/Photonic Inverse Design,” ACES 2025, Orlando, Florida, May 18–21, 2025. DOI: 10.23919/ACES66556.2025.11052563

11. E. Simsek, "Finite-Differences-Based Solvers for Wave Propagation in Dielectric Waveguides and Rings," ACES 2025, Orlando, Florida, May 18–21, 2025. DOI: 10.23919/ACES66556.2025.11052504
12. S. H. Oishe, R. Islam, C. R. Menyuk, and E. Simsek, "Broadband Substrate Optimization with Adjoint Method and Green's Functions," IEEE Photonics Conference, 10-14 November 2024, Rome, Italy. DOI: 10.1109/IPC60965.2024.10799645
13. R. Islam, C. R. Menyuk, and E. Simsek, "Effective Heat Dissipation from Plasmon Enhanced Monolayer WSe₂ Phototransistors," IEEE Photonics Conference, 10-14 November 2024, Rome, Italy. DOI: 10.1109/IPC60965.2024.10799557
14. I. Md. Anjum, E. Simsek, S. E. Jamali Mahabadi, T. F. Carruthers, C. R. Menyuk, "Sources of Nonlinearity in Phase Noise of MUTC Photodetectors at Comb-Line Frequencies," IEEE Photonics Conference, 10-14 November 2024, Rome, Italy. DOI: 10.1109/IPC60965.2024.10799674
15. E. Simsek and R. Islam, "A Compact Numerical Model for Photodetectors Made from Two-Dimensional Materials," SPIE Optics + Photonics 2024, Nanoscience + Engineering Symposium, San Diego, CA, 18–22 August 2024. DOI: 10.1117/12.3025227
16. E. Simsek and E. Cho, "Resolution Enhancement with Machine Learning," SPIE Optics + Photonics 2024, Optical Engineering + Applications Symposium, San Diego, CA, 18–22 August 2024. DOI: 10.1117/12.3025225
17. E. Simsek and C. R. Menyuk, "Thermal Characterization of Modified Uni-Traveling Carrier Photodetectors: Insights into Temperature-Dependent Performance Metrics," SPIE Optics + Photonics 2024, Optical Engineering + Applications Symposium, San Diego, CA, 18–22 August 2024. DOI: 10.1117/12.3025230
18. E. Simsek, R. Islam, C. Menyuk, "Numerical Modeling of Photodetectors Made from Two-Dimensional Materials," 2024 IEEE International Symposium on Antennas and Propagation and ITNC-USNC-URSI Radio Science Meeting on 14-19 July 2024 in Florence, Italy. DOI: 10.1109/AP-S/INC-USNC-URSI52054.2024.10686555
19. E. Simsek and E. Cho, "Enhancement of Non-Destructive Measurement Resolution with Neural Networks," 2024 IEEE International Symposium on Antennas and Propagation and ITNC-USNC-URSI Radio Science Meeting on 14-19 July 2024 in Florence, Italy. DOI: 10.1109/AP-S/INC-USNC-URSI52054.2024.10686643
20. E. Simsek, "Electromagnetic Classification," 2024 IEEE International Symposium on Antennas and Propagation and ITNC-USNC-URSI Radio Science Meeting on 14-19 July 2024 in Florence, Italy. DOI: 10.1109/AP-S/INC-USNC-URSI52054.2024.10687184
21. R. Islam and E. Simsek, "Modeling Two-Dimensional Material-Based Photodetectors with Finite-Difference Methods," ACES 2024 Conference, May 19-23, 2024, Orlando, Florida, USA. ISBN:978-1-7335096-7-1
22. E. Simsek and R. Islam, "Object Classification using Electromagnetic Data and Neural Networks," ACES 2024 Conference, May 19-23, 2024, Orlando, Florida, USA. ISBN:978-1-7335096-7-1
23. I. Md. Anjum, E. Simsek, S. E. Jamali Mahabadi, T. F. Carruthers, and C. R. Menyuk, "Optimized MUTC Photodetector for Lower Phase Noise at Comb-Line Frequencies Below 40 GHz," 2023 Frontiers in Optics + Laser Science meeting (FiO LS 2023) Oct, 09 – 12, 2023, Tacoma, WA, USA. DOI: 10.1364/FIO.2023.JTu4A.15
24. I. Md. Anjum, E. Simsek, S. E. Jamali Mahabadi, T. F. Carruthers, and C. R. Menyuk, "Dual-Objective Numerical Optimization of MUTC Photodetectors for Frequency Comb Applications," 2023 IEEE Research and Applications of Photonics in Defense (RAPID) Conference, Miramar Beach, FL, USA, Sept. 11–13, 2023. DOI: 10.1109/RAPID54473.2023.1026472
25. E. Simsek, M. Soroush, G. Moille, K. Srinivasan, C. R. Menyuk, "Attention Mechanisms for Broadband Feature Prediction," SPIE Optical Engineering + Applications 2023, San Diego, California, United States, 20 – 24 August 2023. DOI: 10.1117/12.2676135
26. E. Simsek and C. R. Menyuk, "Designing Silicon-Germanium Photodetectors with Numerical Optimization: The Tradeoffs and Limits," SPIE Active Photonic Platforms (APP) 2023, San Diego, California, United States, 20 – 24 August 2023. DOI: 10.1117/12.2676137
27. E. Simsek, M. Soroush, G. Moille, K. Srinivasan, C. R. Menyuk, "Attention Mechanisms for Broadband Feature Prediction for Electromagnetic and Photonic Applications," 2023 Conference on Lasers and Electro-Optics/Europe – European Quantum Electronics Conferences (CLEO/Europe-EQEC 2023), Munich, Germany, June 26 – 30, 2023. DOI: 10.1109/CLEO/Europe-EQEC57999.2023.10231779
28. R. Islam, I. Md Anjum, C. R. Menyuk, and E. Simsek, "Designing Silicon-Germanium Photodetectors with Numerical Optimization: The Trade-off Between Quantum Efficiency & Phase Noise," 2023 Conference on Lasers and Electro-Optics/Europe – European Quantum Electronics Conferences (CLEO/Europe-EQEC 2023), Munich, Germany, June 26 – 30, 2023. DOI: 10.1109/CLEO/Europe-EQEC57999.2023.10232810
29. E. Simsek, I. Md Anjum, T. F. Carruthers, and C. R. Menyuk, "Non-Uniform Time-Stepping and Windowing for

- Fast Simulation of Photodetectors,” 2023 International Applied Computational Electromagnetics Society (ACES) Symposium, Monterey, CA, March 26–30, 2023. (invited) DOI: 10.23919/ACES57841.2023.10114796
30. E. Simsek, I. Md Anjum, and C. R. Menyuk, “Designing Nonlinear Optoelectronic Devices with Numerical Optimization: Lessons Learned,” 44th Photonics & Electromagnetics Research Symposium (PIERS), Prague, Czechia, July 3–6, 2023. DOI: 10.1109/PIERS59004.2023.10221428
 31. E. Simsek, “Designing Energy Efficient Neural Networks According to Device Operation Principles,” 44th Photonics & Electromagnetics Research Symposium (PIERS), Prague, Czechia, July 3–6, 2023.
 32. E. Simsek, I. Md Anjum, and C. R. Menyuk, “Solving Drift Diffusion Equations on Non-uniform Spatial and Temporal Domains,” 44th Photonics & Electromagnetics Research Symposium (PIERS), Prague, Czechia, July 3–6, 2023. DOI: 10.1109/PIERS59004.2023.10221464
 33. E. Simsek, I. Md Anjum, T. F. Carruthers, C. R. Menyuk, D. A. Tulchinsky, K. J. Williams, and J. C. Campbell, “Efficient and Accurate Calculation of Photodetector RF Output Power,” 2022 IEEE Photonics Conference (IPC), 13 – 17 November 2022, Vancouver, Canada. DOI: 10.1109/IPC53466.2022.9975461
 34. I. Md Anjum, E. Simsek, S. E. J. Mahabadi, T. F. Carruthers, and C. R. Menyuk, “Design and Analysis of Low Bias, Low Phase Noise Photodetectors for Frequency Comb Applications Using Particle Swarm Optimization,” 2022 IEEE International Topical Meeting on Microwave Photonics, Online, 04 - 06 October 2022. DOI: 10.1109/MWP54208.2022.9997757
 35. E. Simsek, I. Md Anjum, T. F. Carruthers, and C. R. Menyuk, “Non-Uniform Time-Stepping for Fast Simulation of Photodetectors Under High-Peak-Power, Ultra-Short Optical Pulses,” 22nd International Conference on Numerical Simulation of Optoelectronic Devices, Online, 12–16 September 2022. DOI: 10.1109/NUSOD54938.2022.9894823
 36. E. Simsek, I. Md Anjum, T. F. Carruthers, and C. R. Menyuk, “Designing Photodetectors with Machine Learning,” Advanced Photonics Conference, Novel Optical Materials and Applications, Maastricht, Netherlands, 24 – 28 July 2022. (invited) DOI: 10.1364/NOMA.2022.NoWSC.2
 37. E. Simsek, S. E. J. Mahabadi, T. F. Carruthers, and C. R. Menyuk, “Photodetector Performance Prediction with Machine Learning,” Frontiers in Optics 2021, Washington D.C., December 2021. DOI: 10.1364/FIO.2021.FTu6C.4
 38. I. Md Anjum, S. E. J. Mahabadi, E. Simsek, and C. R. Menyuk, “Calculation of the Phase Noise at Comb-Line Frequencies in a Frequency Comb,” Frontiers in Optics 2021, Online, 01–04 November 2021. DOI: 10.1364/FIO.2021.JTh5A.122
 39. E. Simsek, S. E. J. Mahabadi, I. Md Anjum, and C. R. Menyuk, “Thinner and Faster Photodetectors Producing Lower Phase Noise,” IEEE Photonics Conference 2021, Online, 18 – 21 October 2021. DOI: 10.1109/IPC48725.2021.9593092
 40. E. Simsek, M. Yuan, and Qing H. Liu, “Field Effect Transistors Deploying Anisotropic Two-Dimensional Materials for Light Generation and Detection,” Frontiers in Optics/Laser Science Conference (FIO/LS 2018), Washington, DC, USA, Sept. 16-20, 2018. DOI: 10.1364/FIO.2018.FW6C.5
 41. B. Mukherjee, S. Roy, S. Lodha, S. Ghosh, V. G. Achanta, and E. Simsek, “Plasmonic Enhancements in Anisotropic Thin Films of ReS₂,” IEEE Photonics Conference (IPC 2018), Reston, VA, USA Sept. 30 – Oct. 4, 2018. DOI: 10.1109/IPCon.2018.8527296
 42. E. Simsek, “Solving Schrödinger Equation for Excitons in Multilayered Media,” 2016 IEEE International Symposium on Antennas and Propagation (APS–URSI), pp. 231-232, Fajardo, Puerto Rico, June 26 - July 1, 2016. DOI: 10.1109/APS.2016.7695824
 43. B. Mukherjee and E. Simsek, “Light-Matter Interactions in Complex Media with 2D Materials, Metamaterials, and Quantum Dots,” 2016 IEEE International Symposium on Antennas and Propagation (APS–URSI), pp. 977-978, Fajardo, Puerto Rico, June 26 - July 1, 2016. DOI: 10.1109/APS.2016.7696197
 44. B. Mukherjee, E. Simsek, B. Varghese, M. Zheng, E. S. Tok and C. H. Sow, “Photoconductivity of interconnected nanowires and their electromagnetic-circuit co-simulation,” 2016 USNC-URSI Radio Science Meeting, Fajardo, PR, USA, 2016, pp. 63-64, DOI: 10.1109/USNC-URSI.2016.7588513.
 45. E. Simsek, B. Mukherjee, A. Guchhait, Y. T. Chan, “Enhanced absorption with quantum dots, metal nanoparticles, and 2D materials,” SPIE Photonics West, San Francisco, CA, USA, 13-18 February 2016. DOI: 10.1117/12.2213054
 46. E. Simsek and B. Mukherjee, “Keeping 2D materials visible even buried in SoI wafers,” SPIE Photonics West, San Francisco, CA, USA, 13-18 February 2016. DOI: 10.1117/12.2213085
 47. F. Tseng, D. Gunlycke, and E. Simsek, “Theory and Applications of Strongly Bound Excitons in Layered Transition-Metal Dichalcogenides,” 2015 IEEE Photonics Conference (IPC), pp. 188–189, Reston, Virginia, USA, 4 - 8 October 2015. DOI: 10.1109/IPCon.2015.7323440

48. B. Mukherjee and E. Simsek, "Plasmonics Enhanced Average Absorption of Monolayer MoS₂ in vis-NIR," 2015 IEEE Photonics Conference (IPC), pp. 184–185, Reston, Virginia, USA, 4 - 8 October 2015. DOI: 10.1109/IP-Con.2015.7323495
49. R. Sahin, T. Ersoy, E. Simsek, and S. Akturk, "Zeroth and First-order Bessel Beam Formation of Nanostructures on Thin-film Type Surfaces," 36th Progress In Electromagnetics Research Symposium (PIERS 2015), Prague, Czech Republic, 06-09 July, 2015.
50. D. Gunlycke, F. Tseng, and E. Simsek, "Exciton Physics in Transition-Metal Dichalcogenides at the Atomic Scale," Advanced Photonics 2015, Boston, MA, USA, 27 June - 01 July 2015.
51. B. Mukherjee and E. Simsek, "Enhancing Scattering and Absorption in Two-Dimensional Layered Material Systems with Surface Plasmons and Periodicity," the 31st International Review of Progress in Applied Computational Electromagnetics (ACES 2015), Williamsburg, VA, USA, March 22-26, 2015. ISBN:978-0-9960-0781-8
52. B. K. Sinha and E. Simsek, "Estimation of Depletion- or Injection-induced Changes in Reservoir Stresses using Time-lapse Sonic Data," 2014 IEEE International Ultrasonics Symposium, pp. 260–263, Chicago, IL USA, September 3-6, 2014. DOI: 10.1109/ULTSYM.2014.0066
53. E. Simsek, "On the Development of A New Multi-Physics Solver for Atomically Thin Layered Material Systems," 2014 IEEE Antennas and Propagation Society International Symposium (APSURSI), pp. 1389-1390, Memphis, Tennessee, USA, July 6-12, 2014. DOI: 10.1109/APS.2014.6905020
54. E. Simsek, "A Hybrid Spectral Integral - Finite Element Method for Layered Media Including Graphene-like Atomically Thin Layered Materials," 2014 IEEE Antennas and Propagation Society International Symposium (APSURSI), pp. 2122-2123, Memphis, Tennessee, USA, July 6-12, 2014. DOI: 10.1109/APS.2014.6905388
55. R. Sahin, Y. Morova, E. Simsek, S. Akturk, "Electromagnetic Wave Propagation Through and Reflection from Metal Nano Stripes Fabricated with Femtosecond Laser Ablation," 2014 Radio Science Meeting (Joint with AP-S Symposium, USNC-URSI), pp. 129, Memphis, TN, USA, July 6-12, 2014. DOI: 10.1109/USNC-URSI.2014.6955511
56. C. Ye, K. Sikandar, Z. Li, E. Simsek, V. Sorger, "A Performance Comparison of ITO and Graphene-based Electro-optic Modulators," 2014 Radio Science Meeting (Joint with AP-S Symposium, USNC-URSI), pp. 211, Memphis, TN, USA, July 6-12, 2014. DOI: 10.1109/USNC-URSI.2014.6955593
57. R. Sahin, E. Simsek, and S. Akturk, "Nanometer-Scale Structuring of Gold Thin-Films and Graphene by Femtosecond Laser Bessel Beams," 2014 Conference on Lasers and Electro-Optics (CLEO), San Jose, CA, USA, June 8-13, 2014. DOI: 10.1364/CLEO_SI.2014.STu1E.3
58. E. Simsek, "Graphene: A Two Dimensional Material in Three Dimensional Structures," 2013 IEEE Antennas and Propagation Society International Symposium (APSURSI), pp. 1142–1143, Orlando, FL, USA, July 7-12, 2013. DOI: 10.1109/APS.2013.6711231
59. R. Sahin, E. Simsek, and S. Akturk, "Double Surface Plasmon Resonances Obtained with Bessel-Beam-Written Nanoslits Arrays," The European Conference on Lasers and Electro-Optics and the International Quantum Electronics Conference (CLEO/Europe-IQEC 2013), Munich, Germany, May 12-16, 2013. DOI: 10.1109/CLEOE-IQEC.2013.6801552
60. E. Simsek, "Tunable graphene-based SPR Sensors," Smart Biomedical and Physiological Sensor Technology X (SPIE Defense, Security, and Sensing), 29 April - 3 May 2013, Baltimore, Maryland USA.
61. E. Simsek, J. Liu, and Q. H. Liu, "A Spectral Integral Method for the Analysis of Nano Wires," 30th URSI General Assembly and Scientific Symposium (XXXth URSI GA), Istanbul, Turkey, August 13-20, 2011. DOI: 10.1109/URSIGASS.2011.6050394
62. E. Simsek, "Conventional Computational Electromagnetics toward Nanoscale, Optical, and Plasmonic Applications," International Conference on High Performance Computing & Simulation, Istanbul, Turkey, July 4-8, 2011. (invited) DOI: 10.1109/HPCSim.2011.5999900
63. E. Simsek and B. Sonmez, "Layered Medium Discrete Dipole Approximation," IET 8th International Conference on Computation in Electromagnetics (CEM 2011), Wroclaw, Poland, April 11-14, 2011. DOI: 10.1049/cp.2011.0049
64. E. Simsek and B. K. Sinha, "An Efficient Formulation for Harmonic Waves in Multilayered Cylindrical Structures and its Geophysical Applications," 19th International Geophysical Congress and Exhibition of Turkey, Ankara, November 23-26, 2010.
65. E. Simsek, "Frequency Domain Solvers to Design Functional Nano Structures," 6th Nanoscience and Nanotechnology Conference of Turkey, Izmir, Turkey, June 15-18, 2010.

66. B. K. Sinha and E. Simsek, "Sonic logging in deviated wellbores in the presence of a drill collar," 80th Annual International Meeting, Society of Exploration Geophysicists, Denver, CO, 17-22 Oct. 2010.
67. E. Simsek and Q. H. Liu, "Design of Optical Devices Using Frequency Domain Solvers," International Symposium on Electromagnetic Theory, pp. 536–539, Berlin, Germany, August 16-19, 2010. DOI: 10.1109/URSI-EMTS.2010.5637183
68. E. Simsek and Q. H. Liu, "Integral Equation Solvers and Their Applications in the Optical Regime," ICEAA 09, pp. 230–233, Torino, Italy, Sept. 14-18, 2009. DOI: 10.1109/ICEAA.2009.5297473
69. E. Simsek, "Effective Refractive Index Approximation on the Surface Plasmon Resonance Modes of Metal Nanoparticle Chains and Arrays," PIERS 2009 in Moscow, RUSSIA, 18-21 August, 2009.
70. E. Simsek, "Effects of Inhomogeneous Background to the Surface Plasmon Resonance Modes of Metal Nanoparticle Chains," IEEE CLEO Europe 2009, June 2009. DOI: 10.1109/CLEOE-EQEC.2009.5192449
71. E. Simsek, B. K. Sinha, S. Zeroug, and N. Bounoua, "Influence of breakouts on borehole sonic dispersions," 77th Annual International Meeting, Society of Exploration Geophysicists, San Antonio, TX, Sept. 2007. DOI: 10.1190/1.2792433
72. J. Liu, Y. Lin, J.H. Lee, E. Simsek, and Q. H. Liu, "Application of the hybrid spectral integral method with spectral element method," IEEE Antennas and Propagation Society International Symposium and URSI, Honolulu, HI, June 2007. DOI: 10.1109/APS.2007.4396821
73. B. K. Sinha, E. Simsek, and Qing-Huo Liu, "Elastic wave propagation in deviated wells in anisotropic formations," 76th Annual International Meeting, Society of Exploration Geophysicists, New Orleans, LA, Oct. 2006. DOI: 10.1190/1.2370205

Poster Presentations (Juried/Refereed):

1. R. Islam, P. Shandilya, Y. Song, A. Niang, G. Carter, T. Carruthers, M. Loncar, C. R. Menyuk, E. Simsek, "Noise Reduction in Microresonators using Feedback-Controlled Phase Modulation," CLEO 2026, Charlotte, NC, May 17-21, 2026.
2. E. Simsek, "Dielectric Waveguides," 25th International Conference on the Computation of Electromagnetic Fields (COMPUMAG 2025), Naples, Italy, June 22–26, 2025.
3. E. Simsek, "A More Realistic Coupled Dipole Approximation Model for Plasmonic Waveguides," ECIO 2010, Cambridge, UK, April 7-9, 2010.
4. E. Simsek and B. K. Sinha, "An Efficient Formulation for Harmonic Waves in Multilayered Cylindrical Structures," IEEE UFFC Symposium, pp. 1483–1486, Roma, Italy. 20-23 Sept. 2009. DOI: 10.1109/ULTSYM.2009.5442077
5. I. M. Anjum, A. S. Hastings, D. A. Tulchinsky, K. J. Williams, C. R. Menyuk, and E. Simsek, "Thermal Analysis of Photodetectors in Steady-State," OPTICA Sensing Congress 2024, July 15 – 19, 2024, Toulouse, France.

Abstracts Accepted by International Conferences (Juried/Refereed):

1. R. Islam, C. R. Menyuk, and E. Simsek, "Physics-Based Numerical Optimization of Normally Excited MUTC Photodetectors Achieving 60-GHz 3-dB Bandwidth," accepted for a poster presentation at the SPIE Optics and Photonics 2026 Conference, San Diego, CA, Aug. 23-27, 2026.
2. R. Islam et al, "Self-trapping of dissipative Kerr solitons for low-noise frequency combs," accepted for a poster presentation at the SPIE Optics and Photonics 2026 Conference, San Diego, CA, Aug. 23-27, 2026.
3. E. Simsek, R. Islam, and C. Menyuk, "Excito-Plasmonic Phototransistors with Improved Thermal Management," Plasmonica Workshop, Modena, Italy, June 25–27, 2025.
4. R. Islam, I. Md Anjum, C. R. Menyuk, and E. Simsek, "Heat Management and Quantum Efficiency Enhancement of Phototransistors Made from Two-Dimensional Materials," OPTICA Sensing Congress 2024, 15 – 19 July, 2024 in Toulouse, France.
5. E. Simsek, "Energy Efficient Back-to-Back Neural Networks to Design Photonic Devices," 13th International Conference on Metamaterials, Photonic Crystals and Plasmonics (META 2023), Paris, France, July 18 – 21, 2023.
6. E. Simsek, "ODEMI: One-Dimensional Electromagnetic Inversion Dataset to Study Machine Learning and Lessons Learned," Photonics and Electromagnetics Research Symposium, Hangzhou, 21-25 November 2021.
7. E. Simsek, "Fast Evaluation of Refractive Index with Machine Learning", Photonics and Electromagnetics Research Symposium (PIERS 2019), Rome, Italy, June 17-20, 2019.
8. F. Tseng, E. Simsek, and D. Gunlycke, "Modeling excitons in transition-metal dichalcogenides," AVS 63rd Interna-

- tional Symposium & Exhibition, Nashville, TN, Nov. 7-10, 2016.
9. R. Sahin, E. Simsek, S. Akturk, "Quantitative and Qualitative Studies of Femtosecond Laser Nanopatterning of Graphene," CLEO/Europe-EQEC 2015, Munich, Germany, 21-25 June 2015.
 10. F. Tseng, E. Simsek, and D. Gunlycke, "Controlling exciton population in 2D transition metal dichalcogenides," Graphene Canada 2015, Montreal, Canada, October 14-16, 2015.
 11. F. Tseng, E. Simsek, and D. Gunlycke, "The Tri-Angular Lattice Exciton (3ALE) model: Exciton physics at the atomic scale," AVS 62nd International Symposium & Exhibition, San Jose, CA, Oct 18-23, 2015.
 12. F. Tseng, E. Simsek, D. Gunlycke, "Atomistic model for excitons: Capturing Strongly Bound Excitons in Monolayer Transition-Metal Dichalcogenides," APS March Meeting 2015, San Antonio, TX, March 2-6, 2015.
 13. R. Sahin, E. Simsek, S. Akturk, "Femtosecond Laser Ablation with Bessel Beams and Applications to Plasmonics," 9th Nanoscience and Nanotechnology Conference of Turkey, Erzurum, Turkey, June 24- 28, 2013.
 14. E. Simsek, "Graphene Based Tunable SPR Sensors," APS March Meeting, Baltimore, MD, USA, March 18-22, 2013.
 15. E. Simsek and Q. H. Liu, "Hybrid Optical Waveguides," 11th International Workshop on Finite Elements for Microwave Engineering (FEM2012), Estes Park, Colorado, USA, June 4-6, 2012.
 16. E. Simsek, J. Liu, and Q. H. Liu, "An Efficient Algorithm for the Analysis of a Nano Wire in Homogeneous or Layered Media," PIERS 2011 in Marrakesh, MOROCCO, on March 20-23, 2011.
 17. C. B. Akdal and E. Simsek, "Nanowires for Sensing and Wave-guiding," 7th Nanoscience and Nanotechnology Conference of Turkey, Istanbul, Turkey, June 28- July 2, 2011.
 18. E. Simsek and S. Akturk, "Plasmonic Enhancement inside sub-Wavelength Holes in Metals," 7th Nanoscience and Nanotechnology Conference of Turkey, Istanbul, Turkey, June 28- July 2, 2011.
 19. E. Simsek, T. Aydogan, and G. Barlak, "Surface Plasmon Resonance Modes of Metal Nanostructures Embedded in Layered Media: A Full Analytical Method," PIERS 2010 in Cambridge, MA, USA, 5-8 July 2010.
 20. Q. H. Liu, B. K. Sinha, E. Simsek, "Time-Domain Numerical Models for Acoustoelasticity in Multidimensional Inhomogeneous Media," IEEE International Symposium on Antennas & Propagation, Charleston, South Carolina, June 1-5, 2009 (invited).
 21. E. Simsek and B. K. Sinha, "Estimation of borehole ellipticity using cross-dipole dispersions," 78th Annual International Meeting, Society of Exploration Geophysicists, Las Vegas, Nevada, Nov. 2008.
 22. Q. H. Liu, L. Yun, C. Yu, J.H. Lee, J. Liu, and E. Simsek, "Fast CEM Solvers Based on Volume and Surface Integral Equations," PIERS 2008, Cambridge, MA, July 2008.
 23. E. Simsek and B. K. Sinha, "Influence of a Logging Tool on Modes of Noncircular Fluid-filled Boreholes in Elastic Formations," PIERS 2008, Cambridge, MA.
 24. B. K. Sinha and E. Simsek, "Formation Stress Effects on Wave Propagation in a Fluid-filled Borehole," IEEE International Ultrasonics Symposium, New York, NY, Oct. 2007.
 25. J. Liu, E. Simsek, and Q. H. Liu, "A 3-dimensional Spectral Integral Method for Acoustic and Electromagnetic Wave Scattering," IEEE Antennas and Propagation Society International Symposium and URSI, Albuquerque, NM, July 2006.
 26. J. Liu, J. H. Lee, E. Simsek, and Q. H. Liu, "A Hybrid Spectral Integral Method/Spectral Element Method for Electromagnetic Wave Scattering," IEEE Antennas and Propagation Society International Symposium and URSI, Albuquerque, NM, July 2006.
 27. E. Simsek, J. Liu, Q. H. Liu, "A 3D Spectral Integral Method for Layered Media," IEEE Antennas and Propagation Society International Symposium and URSI, Albuquerque, NM, July 2006.
 28. C. Yu, E. Simsek, and Q. H. Liu, "Accurate Simulation of Electromagnetic Waves Scattered by 3D Objects in a Multilayered Medium by a Surface Integral Equation Method," IEEE Antennas and Propagation Society International Symposium and URSI, Albuquerque, NM, July 2006.
 29. E. Simsek, J. Liu, and Q. H. Liu, "A Spectral Integral Method (SIM) for Layered Media," IEEE Antennas and Propagation Society International Symposium and URSI, Washington, DC, July 2005.
 30. E. Simsek, J. Liu, and Q. H. Liu, "A 2D Hybrid Spectral-Integral/Finite-Element Method for Layered," IEEE Antennas and Propagation Society International Symposium and URSI, Albuquerque, NM, July 2006.
 31. E. Simsek, J. Liu, and Q. H. Liu, "Fast Simulation of Periodic Structures in a Layered Medium", IEEE Antennas and

Propagation Society International Symposium and URSI, Abstract, Washington, DC, July 2005.

32. E. Simsek, Q. H. Liu, and J. Liu, "Fast computation of dyadic Green's function for layered media and its application in interconnect simulations," IEEE Antennas and Propagation Society International Symposium and URSI, Abstract, Monterey, CA, June 2004.

Other Professional Presentations

Invited Lectures, Seminars, and Colloquia:

- "All things multi-layered," LPS [online], August 30, 2023.
- "Designing Energy Efficient Neural Networks According to Device Operation Principles," UMBC CSEE Research Day, May 5, 2023.
- "Applications of Machine Learning for Photonics," UMBC OPTICA Student Chapter, February 3, 2023.
- "All things multi-layered," imec [online], July 28, 2021.
- "Waves in Layered Media: Past, Present, and Future," Sabanci University [online], January 26, 2021.
- "Layered Medium Electromagnetics," Silicon Austria Labs [online], December 1, 2020.
- "Layered Medium Electromagnetics," Royal Holloway, University of London, March 11, 2019.
- "3D Electromagnetic Inversion and Machine Learning," Virginia Tech, October 15, 2018.
- "2D Material Based Nanophotonics," Tennessee Technological University, February 18, 2018.
- "Accurate Modeling of Atomically Thin Layered Materials in Electromagnetic Wave Propagation and Scattering Problems," Duke University, Department of Electrical and Computer Engineering, February 17, 2015, Durham, NC, USA.
- "Layered Medium Electromagnetics," Schlumberger Doll Research, October 13, 2014, Cambridge, MA, USA.
- "Design of Optical Devices Using Frequency Domain Solvers and Analytical Methods," Bilkent University, March 8, 2010.
- "Plasmonics," Istanbul Technical University, February 19, 2010.
- "Extension of Discrete Dipole Approximation to Layered Media," Koc University, October 22, 2009.
- "Design and Analysis of Plasmonic Structures with a Hybrid Integral Equation Solver," 3rd INTELECT Workshop, Istanbul, Turkey, September 7, 2009.
- "Computational Electromagnetics for Real World Problems," University of South Alabama, March 24, 2008.
- "Electromagnetic Scattering from Inhomogeneous Objects of Arbitrary Shaped Embedded in a Layered Medium," University of California Davis, February 25, 2006.

PATENTS

- Bikash K. Sinha and Ergun Simsek, "Estimation of Depletion or Injection Induced Reservoir Stresses Using Time-Lapse Sonic Data in Cased Holes," U.S. Patent 9,176,250, granted November 3, 2015.

SERVICE TO THE DEPARTMENT, UNIVERSITY, COMMUNITY, AND PROFESSION

Service to the Department (UMBC, CSEE)

2018-2024 Member, CSEE Executive Committee

2022-present Member, ECE Graduate Curriculum Committee

2018-2022 Member, CSEE Graduate Curriculum Committee

2018-2025 Director, Graduate Data Science Programs

2021-2022 Member, Faculty Search Committee, Assistant Vice Provost for Applied and Off-Campus Programs

2020-2021 Member, HIT GPD Search Committee

2019-2020 Member, CSEE Lecturer Search Committee

Ph.D. Dissertation/Proposal Committees (UMBC):

- Ishraq Md. Anjum's proposal defense (EE), 08/26/2025
- Pradyoth Shandilya's proposal defense (EE), 12/09/2025
- Pradyoth Shandilya's PhD defense (EE), 04/22/2026

- Sadi M Jawad Ahsan's PhD proposal defense (EE), 05/26/2026
- Ishraq Md Anjum's PhD defense (EE), 06/02/2026
- Akram Ibrahim's PhD defense (Physics), 12/02/2025
- John Wan's proposal defense (Public Policy), 12/05/2025
- Chinonso Ezeobi's PhD defense (EE), 01/28/2026
- Victor Torres's PhD defense (EE), 04/22/2026

Administrative Proposals and Reports:

- B.S. in Electrical, Photonic, and Quantum Engineering, Fall 2025 - Spring 2026
- MPS Data Science - Annual Program Review Report, Spring 2025
- MS in Applied Data Science proposal, Fall 2024-Spring 2025
- MPS in Artificial Intelligence proposal, Fall 2024-Spring 2025
- MS in Artificial Intelligence, Fall 2024-Spring 2025

Service to the University (UMBC)

2019-present Member, UMBC Graduate Faculty

Participation in College of Engineering and Information Technology (COEIT) Graduate Program Directors meetings and faculty/program-director searches, 2018-2025.

Earlier University Service (Prior Institutions)

The George Washington University:

- Member, Graduate Admissions and Support Committee, 2011-2016
- Member, Undergraduate Curriculum Committee, 2011-2015
- Member, Research Committee, 2011-2015
- Member, Undergraduate Recruiting Committee, 2015-2016
- Member, Graduate Recruiting and Award Committee, 2015-2016
- Member, Distinguished Lecture Committee, 2016
- Member, New Faculty Search Committee, 2013 and 2015
- Member, ABET Committee, 2012-2013
- Member, PhD Preliminary Exam Preparation and Grading Committee, 2015-2017
- Judge, SEAS R&D Days and SEAS Pelton Prize Competitions
- Dissertation committee member (e.g., Gregory Mitchell 2015, Qianyi Zhao 2013) and thesis committee member (e.g., Wanxin Dong and Siyan Liu, both 2016)

Bahcesehir University:

- Member, Graduate Curriculum Committee, 2008-2011
- Member, Undergraduate Curriculum Committee, 2008-2011
- Member, MUDEK (Turkish ABET) Committee, 2010-2011
- Director of Erasmus and other exchange programs
- CO-OP coordinator for Alcatel-Lucent related courses

Service to the Community

- Speaker and Host, "UMBC Global Welcome: Data Science Edition," online event for international students admitted to UMBC's Data Science graduate program, April 30, 2025
- Speaker, "Why and How to Teach Yourself Data Science," UMBC Paws & Pivot Webinar Series (for people affected by workforce changes in the DMV), April 23, 2025
- Speaker, Poolesville High School, Branch Out! Career Panels: Data Science, July 27, 2023
- Organizing and chairing seminars, webinars, and "open house" events for current and prospective data science students, at least twice a semester, UMBC, 2018-2025
- Co-organizer, Nano@GW Workshops and ECE Research Blitz; organized ECE Colloquium talks, social events, and R&D Days, George Washington University, 2012-2014

- Webinars for prospective graduate students; talks at high schools about GW, SEAS, and STEM, George Washington University, 2012-2016
- Seminars and webinars for prospective undergraduate and graduate students; hosted high-school summer interns, Bahcesehir University, 2008-2011

Service to the Profession

2026 Committee Member, IEEE Photonics Conference (IPC), Microwave Photonics and Vehicular Optics, Denver, CO

2025 Committee Member, IEEE Photonics Conference (IPC), Microwave Photonics and Vehicular Optics, Singapore

2024 Session Chair, “Industry, New Methods, and Science Applications I,” SPIE Optics + Photonics, Applications of Machine Learning Symposium

2024 Session Chair, “Machine-Learning as Applied to EM - Trends, Advances, and Applications III,” IEEE International Symposium on Antennas and Propagation and USNC-URSI Radio Science Meeting

2023-2024 Program Committee Member, Applications of Machine Learning conference, part of SPIE Optics + Photonics

2023-present Review Editor, Editorial Board of Terahertz and Microwave Photonics (specialty section of Frontiers in Photonics)

2023 Session Organizer and Subcommittee 1 Member (Computational Electromagnetics, EM Compatibility, Scattering and EM Theory), 44th PIERS, Prague, Czechia

2015-2020 Associate Editor, IEEE Journal on Multiscale and Multiphysics Computational Techniques

2019 Subcommittee 2 Member (Metamaterials, Plasmonics and Complex Media), 42nd PIERS, Xiamen, China

2015 Co-organizer and Co-chair, “Nano-Electromagnetics” session, 31st ACES, Williamsburg, VA

2012 Organizer and Chair, “FEM and CEM Applications in Optics and Nanophotonics” session, 11th International Workshop on Finite Elements for Microwave Engineering

2010-2019 Proposal Reviewer/Panelist: Leverhulme Trust UK (2019); NSF ECCS (2014); NSF SBIR/STTR (2015); U.S. Army Research Office (2015); The Israel Science Foundation (2014); TUBITAK (2010)

ongoing Manuscript Reviewer: IOP Nanotechnology, ACS Nano, Plasmonics, Journal of Optics, Journal of the Optical Society of America B, Optical Materials Express, New Journal of Physics, Radio Science, Electromagnetics, IEEE Journal of Selected Topics in Quantum Electronics, IEEE Transactions on Antennas and Propagation, IEEE Transactions on Microwave Theory and Techniques, Geoscience & Remote Sensing

TEACHING EXPERIENCE

Graduate Courses, UMBC

- ENEE 684 Introduction to Photonics (Fall 2026: 7 students)
- ENEE 680 Electromagnetic Theory (Fall 2023: 6 students; Fall 2024: 4 students; Fall 2025: 2 students)
- Developed and taught ENEE 691 Special Topics: Machine Learning and Photonics, Spring 2023
- Developed DATA 607 Leadership in Data Science (materials created Summer 2023)
- DATA 601 Introduction to Data Science (Spring 2021, Fall 2021, Spring 2022)
- DATA 606 Capstone in Data Science (every Fall/Spring, 2019-2021)
- Developed DATA 690 Statistical Analysis and Visualization with Python (Fall 2020)
- Two-day Python workshops (Summer 2019, 2020, 2021, online)

Undergraduate Courses, UMBC

- CMPE 306 Introductory Circuit Theory (Spring 2026: 89 students)
- CMPE 330 Electromagnetic Waves and Transmission (Spring 2024: 12; Spring 2025: 11; Spring 2026: 23 students)
- CMSC 411 Computer Architecture (Spring 2022: 40; Fall 2022: 36 students)

The George Washington University

- ECE 3315 Fields and Waves I and ECE 4320 Fields and Waves II, every spring/fall respectively, 2011-2016 (required for all electrical engineering majors)

- ECE 3310 Introduction to Electromagnetics, Spring 2016
- ECE 2120 Engineering Seminar, redesigned and taught Fall 2014 and Fall 2015
- ECE 6800 Computational Techniques in Electrical Engineering, redesigned, Fall 2015
- ECE 6025 Signals and Transforms in Engineering, Spring 2016

Bahcesehir University

- EEE 3703 Electromagnetic Fields and EEE 3704 Electromagnetic Waves, every fall/spring respectively, 2008-2011 (required for all electrical engineering majors)
- EEE 2101 Circuit Theory I, Spring 2009
- EEE 5012 Numerical Methods in Engineering, Spring 2011
- EEE 5722 Antennas and Propagation for Wireless Communications, Fall 2010

Professional Development

- ASEE, 2024 NSF ENG CAREER Workshop, May 15–17, 2024.
- MORE (Mentoring Others Results in Excellence) Workshop: Getting Your Mentoring Relationship Off to a Good Start, October 6, 2023.
- ALIT (Active Learning Inquiry Teaching) Certificate 2023-2024
 - FDC: Expanding Networks and Connecting with Potential Collaborators, 04/02/24.
 - FDC: Closing the Loop with Rubrics and Test Maps, 03/12/24.
 - FDC: Clarifying Purpose through Transparent Student Learning Outcomes: A Pathway to an Inclusive Syllabus, 01/23/24.
 - FDC: Ungrading and AI: Congruence or Dissonance? 09/28/2023.
 - FDC: Assignment Design in the Age of AI Program Inbox, 09/12/2023.
- Other workshops on teaching
 - UMBC Online Workshop: Writing and/or Talking About Your Teaching (Craft a narrative about your effectiveness as a teacher), 05/10/2023.
 - UMBC's Seventh Annual Provost's Teaching & Learning Symposium, 04/21/2023.
- ASEE DELTA New Faculty Institute, January 20, 2023.
- COEIT/CNMS NSF CAREER Proposal Writing Workshop, January 26, 2023.
- DELTA New Faculty Institute, January 11–20, 2023. A foundational, instructor-led, online program to prepare new engineering faculty members to successfully launch their careers.
- Frontiers of Engineering Education Symposium organized by National Academy of Engineering, Irvine, CA, Oct. 23–27, 2013.
- Junior Faculty Learning Community Program, George Washington University. A year-long program aimed at strengthening junior faculty's teaching techniques, 2013.

MISCELLANEOUS

- Licensed Professional Engineer, License No. E 22513, since 2018.
- Citizenship: Citizen of Turkiye and the United States.
- Languages: Turkish (native), English (advanced), Italian (intermediate).