

Education

Ph.D., Electrical Engineering

2023, Oklahoma State University

Dissertation: Analysis and Modeling of Temporal Dispersion in Terahertz Wireless Channels with Applications for Communication and Sensing.

M.S., Electrical Engineering

2020, Oklahoma State University

Thesis: Group Velocity Dispersion Management in Terahertz Wireless Communication Channels

B.S., Electrical Engineering

2018, Oklahoma State University, *Summa Cum Laude*, with honors.

Specializing in digital design and computer architecture.

Honors

National Science Foundation Graduate Research Fellowship

2020-2024, National Science Foundation

Honorary Graduate Commencement Marshal

2023, Graduate College, Oklahoma State University

ECE Graduate Student of the Year

2021, School of Electrical and Computer Engineering, Oklahoma State University

Experience

Teaching Assistant Professor

2025 - Present, School of Electrical and Computer Engineering, Oklahoma State University, Stillwater, OK.

Teach laboratory-intensive undergraduate coursework associated with electrical and computer engineering.

- Coursework
 - ECEN 2233 Digital Logic Design
 - ECEN 3714 Network Analysis
 - ECEN 3714 Systems 1
- Served on multiple department committees.
- Faculty advisor for IEEE.
- Participated in K-12 outreach events.
- One of five department representatives for OSU's AI Integration Program.

Adjunct Faculty - Lecturer

2024 - 2025, School of Electrical and Computer Engineering, Oklahoma State University, Stillwater, OK.

Teach undergraduate-level electrical engineering courses in control theory.

Postdoctoral Research Fellow

2023 - 2024, Ultrafast Optoelectronics Laboratory, Oklahoma State University, Stillwater, OK.

Provide training and technical support for high-performance sub-millimeter-wave test instrumentation while overseeing diverse teams of graduate and undergraduate researchers and conducting original research.

- Built and evaluated a 130 GHz radar system, resulting in 2 conference papers.
- Collaboratively developed 6G testbed for NASA-funded project, resulting in 1 conference paper and a technology demonstration.
- Extended dissertation results and published in IEEE Communications Magazine.
- Guest lecturer for ECEN 4613 Microwave Engineering and ECEN 5613 Electromagnetic Theory.
- Supported courses ECEN 5833 Fiber Optic Communication Systems, ECEN 2714 Fundamentals of Electric Circuits, and ECEN 4013 Design of Engineering Systems (CubeSat and Moonbounce projects).
- Research team leadership and mentorship (5 graduate students, 2-3 undergraduates).

Graduate Research Assistant

2018 - 2023, Ultrafast Optoelectronics Laboratory, Oklahoma State University, Stillwater, OK.

Conducted original research in communication, electromagnetics, and optics while providing technical support for laboratory instrumentation.

- Adapted Bragg reflector theory for GDD management at terahertz frequencies; produced patent US11431377B1 and a journal article.
- Formalized theoretical framework for GDD in wireless links; produced three journal articles.
- Assembled and managed high-performance sub-millimeter-wave test instrumentation purchased under NSF MRI grant 2018110.
 - Developed SOPs, test procedures; maintained documentation on GitHub.
 - Trained students and external collaborators; oversaw use of equipment. Co-authorship with collaborators produced one journal article.
- Presented semesterly technical & tutorial talks at research meetings.
- Prepared and presented demonstrations for local schools.
 - Custom PCB layout and fabrication, embedded electronics programming.
- Mentored graduate and undergraduate students.

Measurement Development Assistant

2017-2018, Robust Electromagnetic Field Testing and Simulation Laboratory, Oklahoma State University, Stillwater, OK.

Developed and executed test plans for radio-frequency characterization of materials and instrumentation at the Richmond Hill research facility.

- Assisted a NASA-funded project to characterize electromagnetic field coupling through various aperture geometries.
 - Programmed embedded systems to interface with Labview.
 - Rewrote existing Labview code controlling test instrumentation, reducing runtime of experiments from days to hours.
- Collaborated with an external aerospace research team.
- Designed and executed test procedure characterizing scattering parameters of novel composites for unmanned stealth aircraft.

Volunteer Undergraduate Researcher

2014, Robotics Cognition Laboratory, Oklahoma State University, Stillwater, OK.

- Programmed bio-inspired computer vision navigation algorithm for resource-constrained systems.
- Wrote OpenCV/Python code within the Robot Operating System (ROS) framework.

Publications

Journal Articles

H. Guo, S. Ghosh, F. Zhang, S. Lee, W. Choi, S. Dong, I. Momson, K. Strecker, Kenneth K. O, "10-GSymbols/s Supply-Modulated APSKC SiGe HBT Transmitter RF Front End for Operation at 250 GHz With 6.8-dBm Peak Modulated Power," in *IEEE Journal of Solid-State Circuits*, vol. 60, no. 9, pp. 3082-3094, Sept. 2025, doi: 10.1109/JSSC.2025.3575769

Strecker, K., Ekin, S., & O'Hara, J.F. (2025). "A Perspective on the Impact of Group Delay Dispersion in Future Terahertz Wireless Systems." *IEEE Wireless Communications Magazine* 63(3), 190-196.
DOI: 10.1109/MCOM.002.2400040

Strecker, K., Otto, M., Nagai, M., O'Hara, J.F., and Mendis, R. (2023) "Artificial dielectric beam-scanning prism for the terahertz region." *Scientific Reports* 13(1), 13793.
DOI: 10.1038/s41598-023-41046-z

Strecker, K., Ekin, S., & O'Hara, J. F. (2021). "Fundamental performance limits on terahertz wireless links imposed by group velocity dispersion." *IEEE Transactions on Terahertz Science and Technology*, 12(1), 87-97.
DOI: 10.1109/TTHZ.2021.3127151

Messenger, R., Strecker, K., Ekin, S., & O'Hara, J. F. (2021). "Dispersion From Diffuse Reflectors and Its Effect on Terahertz Wireless Communication Performance." *IEEE Transactions on Terahertz Science and Technology*, 11(6), 695-703.
DOI: 10.1109/TTHZ.2021.3115725

Strecker, K., Ekin, S., & O'Hara, J. F. (2021). "M-ary quadrature amplitude modulation order optimization for terahertz wireless communications over dispersive channels." *ITU Journal on Future and Evolving Technologies*, 2(7).
DOI: 10.52953/GQXZ9838

Strecker, K., Ekin, S., & O'Hara, J. F. (2020). "Compensating atmospheric channel dispersion for terahertz wireless communication." *Scientific Reports*, 10(1), 1-8.
DOI: 10.1038/s41598-020-62692-7

Peer-Reviewed Conference Papers

In-person talks are indicated by an asterisk.

*K. Strecker, G. L. Captain, F. Tuschhoff, R. Mendis and J. O'Hara, "Detecting Small Targets With Sub-Terahertz RADAR," 2024 IEEE Military Communications Conference (IEEE MILCOM), Washington, DC, USA, 2024 (submitted)

J. O'Hara, K. Strecker, G. L. Captain, F. Tuschhoff, R. Mendis, M. d'Agostino, and J. Gates, "Long-Distance, Multi-Gigabit-Per-Second Sub-Terahertz Wireless Communication," 2024 IEEE Military Communications Conference (IEEE MILCOM), Washington, DC, USA, 2024 (submitted)

*K. Strecker, R. Mendis and J. O'Hara, "Sub-THz RADAR Systems: Realistic Performance Trade-Offs Using Commercial Hardware," 2024 IEEE Texas Symposium on Wireless and Microwave Circuits and Systems (WMCS), Waco, TX, USA, 2024, pp. 1-6
DOI: 10.1109/WMCS62019.2024.10619026

*K. Strecker, W. Choi and J. O'Hara, "A Wideband Millimeter-Wave Communication and Sensing Testbed for 75–500 GHz," 2023 IEEE Texas Symposium on Wireless and Microwave Circuits and Systems (WMCS), Waco, TX, USA, 2023, pp. 1-5

DOI: 10.1109/WMCS58822.2023.10194272

J. O'Hara, R. Mendis, and K. Strecker, "Platform for Next-Generation Terahertz Application Studies," Proc. SPIE 12683, Terahertz Emitters, Receivers, and Applications XIV; 126830I (2023). SPIE Optical Engineering + Applications Conference, 2023, San Diego, CA. Published 4 Oct. 2023.

DOI: 10.1117/12.2681930

K. Strecker, S. Ekin, & J. O'Hara (2020). "Correction of channel dispersion in terahertz wireless communications." Next-Generation Spectroscopic Technologies XIII (Vol. 11390, pp. 62-71).

DOI: 10.1117/12.2559120

Presented digitally due to COVID.

Patents

John F. O'Hara and Karl L. Strecker, U.S. Patent 11,431,377 B1 "Method and tunable apparatuses for dynamic dispersion compensation of wireless terahertz signals," 2022.

A method of passive chromatic dispersion compensation for millimeter wave wireless links that is 98% efficient and compensates 99%+ of atmospheric dispersion.

Proposals and Grants

Funded works are indicated by an asterisk.

* "Versatile experimental platform for 6G and beyond communications and sensing innovations," NASA (\$1M)

"Non-traditional Methods in Threat Detection," DoD (\$100k)

"SINTRA Multimodal Architecture (SMA)," IARPA (\$700k)

"Collaborative Research: Artificial Dielectric Materials for the THz Regime," NSF \$200k

* "Investigating Atmospheric Dispersion in Terahertz Wireless Links," NSF GRFP (\$111k)

* "Continuous-Wave Terahertz System for Integrated Time- and Frequency-Domain Measurements," AFOSR DURIP (\$95.8k)

"Point-to-point ultra-wideband radios for terahertz (PURT)," AFRL (\$3.3M)

"Miniature Airborne Wind LIDAR," AFWERX STTR (\$337.5k)

Service

Undergraduate Program Committee, 2025-Present

Faculty Advisor for IEEE Student Organization, 2025-Present

Summer Bridge Staff, 2019 & 2025, Oklahoma State University

Differential Equations Curriculum Committee member, 2025

Reviewer for Nature Electronics, APL Photonics, and IEEE MILCOM conference.

Invited Speaker, 2023, ECE Graduate Program Recruitment Social

NSF GRFP Workshop Panelist, 2022-2023, Oklahoma State University Graduate College

Technical Skills

Programming languages

Matlab, Python; experience with C, Java, Labview, and HTML.

Lab Equipment

Lock-in amplifiers, VNA & PNA network analyzers, RF spectrum analyzers, oscilloscopes, AWGs, microwave and mm-wave mixers, amplifiers, frequency multipliers, amplifiers, waveguides. Ti:Sapphire femtosecond lasers, fiber lasers, optical amplifiers, optical modulators, spectrum analyzers.

Experienced in optic, RF, computer, microdevice (cleanroom) and electronic lab environments.

Publishing and Graphical Design

LaTeX, Affinity Publisher, Photoshop.

Other

HAM radio Amateur Extra license; call sign AI5AX.

Non-Academic Volunteer Experience

Ranger and Trail Guide Lead

2022-Present, Trail Life Troop OK-0716, Stillwater, OK

Head of Troop OK-0716's K-5th program.

- Serve on the troop leadership committee, plan troop, local, and state-wide events.
- Train and lead teams of volunteers to deliver weekly program content.
- Manage weekly meetings.
- Deliver lessons on outdoor skills, science & technology, history, and character development.

Youth Ministry Teacher

2014-Present, Bible Baptist Church, Stillwater, OK

- Write and deliver weekly lessons.
- Worked on a 2-person team to rewrite the church's 3-year curriculum.
- Wrote 2024 summer outreach program curriculum.

Volunteer STEM Teacher

2015, 2017, 2020, 2022, *Heritage Academy*, Stillwater, Oklahoma

Write and teach original STEM curriculums for grades 4th-12th

Courses taught include:

- How to Write a Research Paper (2015, 2022), 7th - 12th grades. Students learned thesis formation, research methodology, outlining, drafting, revising, citations, and wrote their own research papers.
- Computer Systems (2020), 7th - 12th grades. Students assembled workstations, networked them, learned basic IT principles and programming in Python.
- Introduction to Science and Engineering (2016), 4th - 12 grades. Students learned scientific principles such as germ theory, energy conservation, information science, and chemistry; applied them in hands-on engineering projects.

References

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