Mehmet Kurum, PhD

CONTACT INFORMATION

Associate Professor and Director of Graduate Studies
Director of InforMation PRocessing and SenSing Lab
School of Electrical and Computer Engineering
The University of Georgia
Boyd Graduate Center, Room #105
200 D. W. Brooks Drive, Athens, GA 30602

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*Web:*https://impress.engr.uga.edu/

EDUCATION

The George Washington University, Washington, DC

Ph.D., Electrical Engineering, ... **(08/2009)**

M.S., Electrical Engineering, ... **(05/2005)**

Bogazici University, Istanbul, Turkey

B.S., Electrical and Electronics Engineering, ... **(07/2003)**

RESEARCH INTERESTS

- Applied electromagnetics, signal processing, and wireless systems,
- Spectrum coexistence, sensing, and recycling,
- Radar, microwave radiometry, and signals of opportunity,
- Software-defined radio and ubiquitous RF sensing,
- Sensor fusion/ machine learning for inverse remote sensing problems,
- Off-road and aerial robotics, and self-sustainable systems

TEACHING EXPERIENCE

The University of Georgia, Athens, GA
School of Electrical and Computer Engineering,

Associate Professor,

- ELEE 8155 Microwave Remote Sensing (XX students), ... **(Spring 2027)**
- ELEE 4020 Electromagnetics (59 students), ... **(Fall 2026)**
- ELEE 6/4030 Applied Electromagnetics (12 students), ... **(Spring 2026)**
- ELEE 6/4990 Radar Signal Processing (8 students), ... **(Spring 2026)**
- ELEE 4020 Electromagnetics (65 students), ... **(Fall 2025)**
- ELEE 6/4030 Applied Electromagnetics (9 students), ... **(Spring 2025)**
- ELEE 4020 Electromagnetics (36 students), ... **(Fall 2024)**
- ELEE 8155 Microwave Remote Sensing (9 students), ... **(Spring 2024)**

Mississippi State University, Starkville, MS
Department of Electrical and Computer Engineering

Associate Professor,

- ECE 8990 Microwave Remote Sensing (15 students), ... **(Fall 2022)**

Assistant Professor,

- ECE 3323 Electromagnetics II (31 students), ... **(Spring 2022)**
- ECE 3323 Electromagnetics II (22 students), ... **(Fall 2021)**
- ECE 8990 Microwave Remote Sensing (9 students), ... **(Spring 2021)**
- ECE 3323 Electromagnetics II (30 students), ... **(Fall 2020)**
- ECE 3313 Electromagnetics I (40 students), ... **(Spring 2020)**
- ECE 6313/4313 Antennas (16 students), ... **(Fall 2019)**
- ECE 3323 Electromagnetics II (40 students), ... **(Spring 2019)**
- ECE 6990/4990 Microwave Remote Sensing (24 students), ... **(Fall 2018)**

- ECE 3323 Electromagnetics II (34 students), ... **(Spring 2018)**
- ECE 6333/4333 RF and Microwave Engineering (13 students), ... **(Fall 2017)**
- ECE 3313 Electromagnetics I (31 students), ... **(Spring 2017)**
- ECE 3323 Electromagnetics II (22 students), ... **(Fall 2016)**

The George Washington University, Washington, DC
Department of Electrical and Computer Engineering

Adjunct Professor,

- ECE 3315 Fields and Waves I (11 students), ... **(Fall 2015)**
- ECE 4320 Fields and Waves II (7 students), ... **(Fall 2010)**

Teaching Assistant,

- Introduction to Digital Signal Processing, ... **(Fall 2003)**

Research Experience

The University of Georgia, Athens, GA
School of Electrical and Computer Engineering,
IMPRESS Lab: InforMation PRocessing and SenSing Laboratory,

Director of Graduate Studies . . . . . **(08/2026–present)**

Associate Professor . . . . . **(08/2023–present)**

Mississippi State University, Starkville, MS
Department of Electrical and Computer Engineering,
IMPRESS Lab: InforMation PRocessing and SenSing Laboratory,

Adjunct Professor . . . . . **(08/2023–08/2024)**

Associate Professor and Paul B. Jacob Endowed Chair . . . . . **(08/2022–08/2023)**

Assistant Professor . . . . . **(08/2016–08/2022)**

The George Washington University, Washington, DC
Department of Electrical and Computer Engineering

Research Scientist . . . . . **(06/2015–07/2016)**

Research Assistant . . . . . **(01/2004–06/2009)**

Scientific and Technological Research Council of Turkey (TUBITAK),
Informatics and Information Security Research Center (BILGEM), Gebze, Kocaeli Turkey

Chief Researcher . . . . . **(12/2012–02/2015)**

NASA Goddard Space Flight Center
Hydrological Sciences Laboratory, Code 617, Greenbelt, MD

Visiting Scholar . . . . . **(07/2014–08/2014)**

Laboratory Manager . . . . . **(12/2011–12/2012)**

Research Associate . . . . . **(06/2011–12/2012)**

NASA Postdoctoral Program Fellow . . . . . **(06/2009–06/2011)**

GRANTS

Total =$23.3M (my share = $8.8M)
Department of Defense (DOD) =$6.0M (my share = $4.2M)
National Aeronautics and Space Administration (NASA) =$9.75M (my share = $3.2M)
National Science Foundation (NSF)=$3.92M (my share = $1.1M)
United States Department of Agriculture (USDA)=$3.5M (my share = $0.35M)

Current (listed by sponsor)

[7] **Role:** *PI*, **Investigators:** Mehmet Kurum (UGA), Dylan Boyd (MSSTATE), Andreas Colliander (FMI) **Title:** "ForBERT: Unified Theory of Radiative Transfer for Vegetation Optical Depth Retrievals at Multiple Modalities," **Sponsor:** NASA A.28 Remote Sensing Theory for Earth Science (NNH24ZDA001N-RST) , Grant Number: 80NSSC26K0705, **Amount:** $606,155, **Duration:** Apr. 15, 2026–Apr. 14, 2029.

[6] **Role:** *PI*, **Investigators:** Mehmet Kurum, Abesh Ghosh (Graduate student) **Title:** "Unlocking Forest Vital Signs: High-Resolution Spatiotemporal VOD Mapping at Large Scales Through GNSS-T and LiDAR Fusion, Advancing NASA Earth Observation Systems", **Sponsor:** NASA, Future Investigators in NASA Earth and Space Science and Technology, Solicitation: NNH24ZDA001N-FINESST, Grant Number: 80NSSC25K0460, **Amount:** $150,000, **Duration:** Nov. 1, 2025–Oct. 31, 2028.

[5] **Role:** *PI*, **Investigators:** Mehmet Kurum (UGA) and Ines Fenni (NASA Caltech/JPL)**Title:** "Sensing Temporal and Spatial Dynamics of Forest Water Content using Global Navigation Satellite System (GNSS) Transmissometry (GNSS-T) Approach: Fundamentals, Testbed, and Data", **Sponsor:** NASA Research Announcement, Global Navigation Satellite System Research, Solicitation: NNH23ZDA001N-GNSS, Grant Number: 80NSSC25K7954, **Amount:** $552,073 (my share is $368,955), **Duration:** Apr. 7, 2025–Apr. 8, 2028.

[4] **Role:** *PI*, **Investigators:** Mehmet Kurum (UGA), Ali Gurbuz(NCSU) **Title:** "Enhancing SMAP Radiometer Performance: Calibration and RFI Detection via Deep Learning ", **Sponsor:** NASA Research Announcement,A.22 Soil Moisture Active-Passive Mission Science Team, Solicitation: NNH23ZDA001N-SMAP, Grant Number: 80NSSC25K7061, **Amount:** $480,258, **Duration:** Jan. 1, 2025–Dec. 31, 2027.

[3] **Role:** *Co-PI*, **Investigators:** Mehmet Kurum, Haijian Sun, Zhenlin An, Kyle J Johnsen, Jin Sun, Wenzhan Song, **Title:** "Collaborative Research: VINES: Track 2: SCOPE-XR: Seeing the Channel: Optimizing Perception-aware Environments for XR," **Sponsor:** NSF Verticals-enabling Intelligent Network Systems (VINES) , **Amount:** $2,167,500 (my share is 10%) **Duration:** Aug. 1, 2026–Jul. 31, 2029.

[2] **Role:** *PI*, **Investigators:** Mehmet Kurum **Title:** "Recycling the Radio Spectrum for Science: A New Paradigm for UAS-based Precision Agriculture", **Sponsor:** NSF, Faculty Early Career Development Program (CAREER), Award Number: 2405807, **Amount:** $500,000, **Duration:** May. 1, 2022–Apr. 30, 2027.

[1] **Role:** *PI*, **Investigators:** Mehmet Kurum (UGA), Vuk Marojevic (MSSTATE), Ali Gurbuz (NCSU), **Title:** "SWIFT-SAT: INtegrated Testbed Ensuring Resilient Active/Passive CoexisTence (INTERACT): End-to-End Learning-Based Interference Mitigation for Radiometers," **Sponsor:** NSF Spectrum and Wireless Innovation enabled by Future Technologies - Satellite-Terrestrial Coexistence (SWIFT-SAT), Award Number:2332662, **Amount:** $750,000 (My share is $250,00), **Duration:** Jan. 1, 2024–Dec. 31, 2026.

Completed (listed by sponsor)

[19] **Role:** *Co-PI*, **Investigators:** Mehmet Kurum (MSU), Vuk Marojevic (PI - MSU), Ali Gurbuz (MSU), Nick Mastronarde (U. Buffalo), Fatemeh Afghah (Northern Arizona U.) **Title:** "SWIFT: LARGE: AI-Enabled Spectrum Coexistence between Aerial Communications and Passive Radio Services: Fundamentals, Testbed and Data," **Sponsor:** NSF Spectrum and Wireless Innovation enabled by Future Technologies (SWIFT) , **Amount:** $516,000 (My share is 30%), **Duration:** Oct. 1, 2020–Sep. 30, 2024.

[18] **Role:** *PI*, **Investigators:** Mehmet Kurum, **Title:** "Realistic and Computationally Efficient 3D Full-Wave Model for Multistatic Scattering from Vegetated Terrains at P/L Band", **Sponsor:** NASA California Institute of Technology Jet Propulsion Laboratory, **Amount:** $108,500, **Duration:** Oct 1, 2022–Sep. 24, 2024.

[17] **Role:** *PI*, **Investigators:** Mehmet Kurum, Md. Mehedi Farhad (Graduate student) **Title:** "Recycling the Radio Spectrum: Enhancing NASA's Earth Observing Systems Products over Forested Terrain by Direct Measurement of Vegetation Optical Depth ", **Sponsor:** NASA, Future Investigators in NASA Earth and Space Science and Technology, Solicitation: NNH22ZDA001N-FINESST , **Amount:** $149,902,
Duration: Sep. 1, 2023–Aug. 31, 2026.

[16] **Role:** *PI*, **Investigators:** Mehmet Kurum, Dylan Boyd (Graduate student) **Title:** "Recycling the radio spectrum: Can anthropogenic signals in LEO be repurposed for science? Advancing soil moisture remote sensing with NASA Signals of Opportunity datasets, forward modeling, and physics-guided machine learning ", **Sponsor:** NASA, Future Investigators in NASA Earth and Space Science and Technology, Solicitation: NNH21ZDA001N-FINESST , **Amount:** $134,731,
Duration: Sep. 1, 2021–Aug. 31, 2024.

[15] **Role:** *PI*, **Investigators:** Mehmet Kurum, **Title:** "GNSS Transmissometry (GNSS-T) of Forest Canopies in support of NASA's SMAP Validation Experiment (SMAPVEX) 2022", **Sponsor:** NASA California Institute of Technology Jet Propulsion Laboratory, **Amount:** $25,138, **Duration:** July 1, 2022–Dec. 31, 2022.

[14] **Role:** *Co-I*, **Investigators:** Mehmet Kurum (MSU), James Garrison (PI - Purdue Univ.), Jeffry Piepmier (NASA GSFC), Manuel Vega (NASA GSFC), Rajat Bilindish (NASA GSFC), Cynthia Firman (NASA GSFC), Matthew Fritts (NASA GSFC), Michael Cosh (USDA), Cornelis Du Toit (AS and D, LLC.), Kameron Larsen (JPL), Rashmi Shah (JPL), David Spencer (Purdue Univ.), **Title:** "SNOOPI: SigNals-Of-Opportunity P-band Investigation", **Sponsor:** NASA Research Announcement, In-space Validation of Earth Science Technologies, Solicitation:NNH17ZDA001N-INVEST, **Total Amount:** $6,138,125 (My share is $115,104), **Duration:** Oct. 1, 2018–Apr. 30, 2023.

[13] **Role:** *Co-PI*, **Investigators:** James Garrison (Purdue Univ.), Mehmet Kurum (MSU), Rajat Bilindish (NASA GSFC), and Jeffry Piepmier (NASA GSFC), **Title:** "Root-Zone and Surface Soil Moisture Retrieval from I, P and S-band Signals of Opportunity (SoOp) Reflectometry", **Sponsor:** NASA Research Announcement, Terrestrial Hydrology, Solicitation: NNH17ZDA001N-THP, **Amount:** $414,000 (My share is $136,245), **Duration:** Jan. 1, 2018–Dec. 31, 2020.

[12] **Role:** *PI*, **Investigators:** Mehmet Kurum, **Title:** "Developing Radar Scattering Models for UAVSAR", **Sponsor:** NASA California Institute of Technology Jet Propulsion Laboratory, **Amount:** $30,450 , **Duration:** May 1, 2019–Dec. 31, 2019.

[11] **Role:** *PI*, **Investigators:** Mehmet Kurum (MSU), Orhan Eroglu (Grad Student, MSU), **Title:** "Unveiling CYGNSS Land Signatures for High Spatiotemporal Soil Moisture Estimation", **Sponsor:** NASA Earth and Space Science Fellowship (NESSF) Program, **Amount:** $134,620, **Duration:** Sep. 1, 2018–Dec. 31, 2019.

[10] **Role:***Co-PI*, **Investigators:** Roger Lang (GWU), Peggy O'Neill (NASA GSFC), Mehmet Kurum (GWU), **Title:** "Multi-frequency Soil Moisture Measurements and Analysis: SMAP L2-SM-P Retrieval Improvements", **Sponsor:** NASA Goddard Space Flight Center, Grant Number NNX16AD94G, **Amount:** $58,992, **Duration:** Apr. 1, 2016–Mar. 30, 2017.

[9] **Role:** *Science PI*, **Investigators:**, Peggy O'Neill (NASA GSFC), Mehmet Kurum (NASA GSFC) **Title:** "Modified Tau-Omega Model for Moderately to Densely Vegetated Landscapes", **Sponsor:** NASA Research Opportunities in Space and Earth Sciences (ROSES) NNH09ZDA001N-RST, Remote Sensing Theory, **Amount:** $375,802, **Duration:** Oct. 1, 2010–Sep. 30, 2013.

[8] **Role:** *Co-PI*, **Investigators:** Mehmet Kurum (MSU), Robert Moorhead (PI, MSU), Joby Czarnecki (MSU), Sathishkumar Samiappan(MSU), **Title:** "Advancement of UAS/UAV Application Systems," **Sponsor:** USDA Agricultural Research Service(USDA-ARS), Award # NACA 58-6064-9-007 **Amount:** $3,452,369 (My share is 10%) **Duration:** Sep. 01, 2018–Sep. 30, 2023.

[7] **Role:** *Co-PI*, **Investigators:** Mehmet Kurum (MSU), Ali Gurbuz (MSU), **Title:** "Detecting Biological and Chemical Threats in Complex Subterranean Environments," **Sponsor:** DOD, U.S. Army Engineering Research & Development Center (ERDC), **Amount:** $1,525,734 (My share is 50%) **Duration:** Oct. 1, 2021–Sep. 30, 2024. [change of PI due to departure from MSU]

[6] **Role:** *PI*, **Investigators:** Mehmet Kurum (MSU), John Ball (MSU), Ali Gurbuz (MSU), **Title:** "Sensor Fusion Based Remote Sensing for National Disaster Damage Assessment," **Sponsor:** DOD, U.S. Army Engineering Research & Development Center (ERDC), Award # W912HZ21C0022 **Amount:** $238,105 (My share is 40%) **Duration:** May. 26, 2021–May. 25, 2023.

[5] **Role:** *Co-PI*, **Investigators:** Mehmet Kurum (MSU), John Ball (PI, MSU), Ali Gurbuz (MSU), Lalitha Dabbiru (MSU), **Title:** "Multi-Sensor Analytics and Sensor Fusion for Cross Country Mobility Assessment," **Sponsor:** DOD, U.S. Army Engineering Research & Development Center (ERDC), Award # W912HZ21C0022 **Amount:** $360,041 (My share is 20%) **Duration:** May. 26, 2021–May. 25, 2023.

[4] **Role:** *PI*, **Investigators:** Mehmet Kurum (MSU), John Ball (MSU), Pat Donohoe (MSU), Jenny Du (MSU), Ali Gurbuz (MSU), **Title:** "SimBRS II TO002- Advanced Modeling and Simulation of Multi-Physics Material Response in Geoenvironments -Topic 6: Remote Sensing and Sensor Fusion", **Sponsor:** DOD, Combat Capabilities Development Command (CCDC), Award # W56HZV-17-C-0095 **Amount:** (My share is $2,914,626) **Duration:** Sep. 22, 2017–May. 30, 2022.

[3] **Role:** *Co-PI*, **Investigators:** Mehmet Kurum (MSU), Ali Gurbuz (PI, MSU), John Ball (MSU), and Pat Donohoe (MSU), **Title:** "UAS-based site characterization", **Sponsor:** DOD, U.S. Army Engineer Research & Development Center (ERDC), **Amount:** $399,502 (My share is 20%), **Duration:** Oct. 1, 2018–Sep. 30, 2019.

[2] **Role:** *Co-PI*, **Investigators:** Mehmet Kurum (MSU), Ali Gurbuz (PI, MSU), John Ball (MSU), George Mason(MSU), **Title:** "Ground Vehicle Mobility Research: Multi-Sensor Analytics and Sensor Fusion for Cross-Country Mobility Assessment", **Sponsor:** DOD, Engineering Research Development Center (ERDC), Award # W912HZ19C0036, **Amount:** $298,128 (My share is 25%) **Duration:** Jan. 1, 2019–Feb. 1, 2021.

[1] **Role:** *PI*, **Investigators:** Mehmet Kurum (MSU), Pat Donohoe (MSU), **Title:** "CRES-GV: HPC-Based Antenna and Multi-Sensor Ground Vehicle Placement", **Sponsor:** DOD, U.S. Army Engineer Research & Development Center (ERDC). **Amount:** (My share is $202,781), **Duration:** Jan. 01, 2018–Sep. 30, 2018.

Others Completed (less than $10,000)

[2] **Role:** *PI*, **Investigators:** Mehmet Kurum (MSU), **Title:** "Evaluation and Development of Soil Moisture Retrievals Using CYGNSS Observations over Mississippi", **Sponsor:** MSU, ORED Undergraduate Research Program **Amount:** $2,000 , **Duration:** Oct. 1, 2017–Sep. 30, 2018.

[1] **Role:** *PI*, **Investigators:** Mehmet Kurum (MSU), **Title:** "MS NASA EPSCoR RID Travel Grants", **Sponsor:** MS NASA EPSCoR, [Feb. 1–Mar. 31, 2019, $1,750; Apr. 1–Apr. 30, 2019, $900; Jan. 1–Jan. 31, 2020, $1,750; Dec. 6–Dec. 8, 2021, $800; Jun. 27–Jun. 29, 2022, $1,750],

AWARDS

- 2024 Faculty Fellow in the College of Engineering at UGA
- 2022 Paul B. Jacob Endowed Chair in Electrical and Computer Engineering at MSU
- 2021 NSF CAREER Award
- 2020 Certificate of Excellence in recognition of contributions to research in Electrical and Computer Engineering at MSU
- 2014 URSI (International Radio Science Union) Young Scientist Award
- 2014 IEEE Geosciences and Remote Sensing Society (GRSS) Chapter Excellence Award for excellence as a GRSS Chapter demonstrated by examplary activities during 2014
- 2013 Leopold B. Felsen Award for Excellence in Electromagnetics
- NASA Postdoctoral Program Fellowship, NASA Goddard Space Flight Center, Hydrological Sciences Branch, Code 617, June 2009–June 2011
- Graduate Research & Teaching Assistantship, The George Washington University, Electrical and Computer Engineering Sep 2003–May 2009
- Eight Conference Travel awards from several international/national symposiums during my graduate study at George Washington University, 2004–2009

THESIS SUPERVISION & GRADUATE ADVISING

Advisees are listed in **reverse chronology**.

Current Ph.D. (Major Professor)

- *Joyita Halder*, (Spring 2025–present)
- *Kaies Al Mahmud*, (Spring 2024–present)
- *Sriman Bidhan Baray*, (Spring 2024–present)
- *Tanvir Anjum*, (Spring 2024–present)
- *Ehsanul Hoque*, (Spring 2023–present)
- *Abesh Ghosh*, (Fall 2022–present)

Current Ph.D. (Co-Major Professor)

- *Muneeb Elahi Malik*, (Fall 2025–present)

Current M.S. and Ph.D. (Committee Member)

- *Denis Olgen Kiobia*, PhD (Fall 2025 to present)

Postdoctoral Researcher Advising

- *Dr. Md Mehedi Farhad*, (May 2024 to March 2025)
- *Dr. Suraj Amarbahadur Yadav*, Geosystems Research Institute (December 2022 to August 2023)
- *Dr. Fangni Lei*, Geosystems Research Institute (Summer 2019 to Fall 2021)

Graduated Ph.D. (Major Professor)

- *Md Mehedi Farhad*, (**Spring 2024**): Dissertation: Estimating Surface Reflectivity with Smartphone and Semi-Custom GNSS Receivers on UAS-based GNSS-R Technology and Surface Brightness Temperature using UAS-based L Band Microwave Radiometer. **First Job:** The University of Georgia, Athens, GA. In **2025**, he started as an assistant professor at Department of Electrical and Computer Engineering, the University of Alabama, Tuscaloosa, AL.
- *Dylan R Boyd*, (**Summer 2023**): Dissertation: Exploring bistatic scattering modeling for land surface applications using radio spectrum recycling in the Signal of Opportunity Coherent Bistatic Simulator. **First Job:** NASA Goddard Space Flight Center, Greenbelt, MD. In **2025**, he started as an assistant professor at Department of Electrical and Computer Engineering, Mississippi State University, Starkville, MS.
- *Himangi Srivastava*, (**Summer 2021**): Dissertation: Methods for Inference and Analysis of Gene Networks from RNA Sequencing Data. **First Job:** The University of Colorado Anschutz Medical Campus, Denver, CO.
- *Orhan Eroglu*, (**Fall 2019**): Dissertation: Information Retrieval from Spaceborne GNSS Reflectometry Observations using Physics- and Learning-based Techniques. **First Job:**, Computational Information Systems Lab, University Corporation for Atmospheric Research (UCAR), Boulder, CO.

Graduated Master (Major Professor)

- *Mrudang Yogeshbhai Patel*, (Spring-2025): Non-thesis
- *Zachary Warren*, (Spring 2022): Non-thesis. **First Job:** Raytheon Intelligence and Space, Forest MS
- *Austin Flynt*, (Fall 2021): Thesis: Unmanned Ground Vehicle System to Collect Soil Moisture Data. **First Job:** Johns Hopkins University Applied Physics Laboratory
- *Mia Scheider*, (Spring 2021): Thesis: Automating Precision Drone Landing and Battery Exchange. **First Job:** Johns Hopkins University Applied Physics Laboratory
- *Preston Peranich* , (Spring 2021): Thesis: Implementation of UAS-based P-band signals of opportunity receiver for root-zone soil moisture retrieval, Co-advised with Dr. John Ball. **First Job:** Johns Hopkins University Applied Physics Laboratory

Graduated Ph.D. (Committee Member)

- *Walaa Alqwider*, PhD (Spring 2024): Deep R. L. for Advanced Wireless Networks Enabling Service and Spectrum Coexistence.
- *M M Nabi*, PhD (Spring 2024): Deep Learning Based Soil Moisture Retrieval Using GNSS-R Observations from CYGNSS.
- *John Rogers*, PhD (Fall 2023): Neural Networks for Improved Signal Source Enumeration and Localization with Unsteered Antenna Arrays.
- *James Earnest*, PhD (Spring 2023): Dissertation: Eddy current defect response analysis using sum of Gaussian methods.
- *Farhina Haque*, PhD (Summer 2022): Dissertation: Modeling Supercritical Fluids and Fabricating Electret Films to Address Dielectric Challenges in High-Power-Density Systems.
- *Robiulhossain Mdrafi*, PhD (Spring 2022): Dissertation: Data-Driven Sparse Computational Imaging with Deep Learning.
- *Mojtaba Rostaghi Chalaki*, PhD (Fall 2020): Dissertation: Non-conventional sensors for measuring partial discharge under DC electrical stress.

Graduated Masters (Committee Member)

- *Jacob Kruse*, (Summer-2026): Thesis: Learning Dexterous Manipulation from Robust Reward Modeling.
- *Damilola Arinola*, (Spring-2026): Thesis: Use of Ground Oenetrating Radar in Full Depth Reclamation Construction.
- *Ahmed Alam*, (Spring 2024): Thesis: Deep Learning-Based Radio Frequency Interference Detection and Mitigation for Microwave Radiometers with 2-D Spectral Features.

- *Ajaya Dahal*, (Fall 2023): Thesis: Software Defined Radio (SDR) based sensing.
- *Matt Duck*, (Spring 2022): Thesis: Analysis and implementation of low fidelity radar-based remote sensing for unmanned aircraft systems.
- *Samantha Tidrick*, (Fall 2021): Thesis: Evaluation of Hyperspectral Band Selection Techniques for Real-Time Applications.
- *Jan Rainer Jamora*, (Summer 2021): Thesis: Angular-Dependent Three-Dimensional Imaging Techniques in Multi-Pass Synthetic Aperture Radar.
- *Spencer Barnes*, (Spring 2021), Non-Thesis, Software Engineering.
- *Cary McCraine*, (Spring 2020), Non-Thesis.
- *Dylan Sewell*, (Spring 2019): Thesis: Waveform selection to maximize detecting and tracking insects using harmonic oscillators.

CAPSTONE & UNDERGRADUATE ADVISING

Advisees are listed in **reverse chronology**.

Students Supervised for 2026 NASA Student Airborne Research Program (SARP) - June 1 to July 22

- *Mashalle Olomi*, Graduate Science Mentor, University of California, Davis
- *Kira Baker*, Environmental Science, Psychology, Lafayette College
- *Taryn Andersen*, nvironmental Science, GIS, Northern Michigan University
- *Carlynn Rychener*, Biochemistry and Molecular Biology, University of South Carolina
- *Nicholas Bolling*, Geology, Carleton College
- *McRee Taylor*, Environmental Studies, Virginia Commonwealth University
- *Leart Jahaj*, Chemistry, Providence College

High School Students Supervised

- *Edward Huang*, Oconee County High School, (Summer 2024)

Undergraduate Researchers Funded and Supervised

- *Phong Nguyen*, EE, (Spring 2026–present)
- *Louis Marion*, EE, (Fall 2025–Summer 2026)
- *Luis Sanchez*, EE, (Summer 2022–Spring 2023)
- *Adesola Raji*, CPE, (Spring 2021–Spring 2023)
- *Daegan Appel*, EE, (Spring 2021–Spring 2023)
- *Myles Spillers*, CSE, (Spring 2021–Spring 2023)
- *Caleb Bates*, EE, (Spring 2021–Spring 2022)
- *Nathan Goyette*, BS-AE (Spring 2019–Summer 2021)
- *Lily Shows*, BS-CSE (Summer 2019–Summer 2020)
- *Lauren Orsini*, BS-CSE (Fall 2018–Summer 2020)
- *Claudia Nelson*, BS-CSE (Fall 2018–Spring 2020)
- *Luke Redwine*, BS-EE (Fall 2018–Fall 2019)
- *Austin Flynt*, BS-EE (Summer 2018–Fall 2019)
- *Mia Scheider*, BS-EE (Summer 2018–Fall 2019)
- *James Ballard*, BS-EE (Summer 2018–Spring 2019)
- *Abdelmoula Elyazizi*, BS-EE, (Fall 2017–Spring 2018)
- *Cassandra Myers*, BS-EE, (Fall 2016–Spring 2018)
- *Grant Parker*, BS-EE,(Fall 2016–Spring 2018)
- *Conor Ferguson*, BS-EE,(Fall 2016–Fall 2017)
- *Dylan Neil*, BS-EE,(Fall 2017–Spring 2018)
- *Dylan Boyd*, BS-EE,(Fall 2016–Fall 2017)

Senior Design (Capstone) Project Advising

- *Avery Banks and Adithya Raviprakash*, Low-Frequency Antenna Design for Hypothesized Surfaces for Psyche mission, **2025** (sponsored by Arizona State University NASA Psyche Mission)

- *Nathan A. Nobles, Harrison Iles , Daniel Harrison Poorak* , Modelling of dc-dc Power Electronics Converters (buck and boost) with parasitics, **2024** (sponsored by SPAN I/O)
- *Braden Patridge, Logan Tharp, Lane Belk, Klayton Greer, Duncan Ziller*, I.C.U. (Intelligent Collision Utility) Truckers, **2022** (1st place, Fall 2022 Design Awards)
- *Lindsey Byron, April Turner, Caleb Bates,Caleb Hendricks, Grant O'Neal*, Robo Retriever, **2021** (3rd place, Spring 2022 Design Awards)
- *Taylor Brent, Parker Butler, Khalil Markham, Chirantan Sen, Jeremy Grace*, Smart Cornhole, **2021** (3rd place, Fall 2021 Design Awards)
- *Drew Mohundro, Alex Bigej, Preston May, Carol Pollard, Garrett Smith*, The Quicket System (RFID ticket scanner), **2021** (1st place, Spring 2021 Design Awards)
- *Mack Smith, Drew Gann, Hayden Guin, Noah McLaurin*, Spring Fatigue Tester, **2020**
- *Luke Redwine, Devin Logue, Dennis Clark, Austin Flynt*, AuBEx (an automatic Drone battery changing station), **2019** (sponsored by Raytheon, ≈$2,000)
- *Preston Peranich, Jonah Stevens, Noah Ihediwa, Haley Knable*, MFJ ContinuousCarrierTM Intellitune, **2018**
- *Stephen Thomas, Hunter Fowler, Zach Armstrong, Daniel Giles, Trey Hubbard*, Autonomous Drone Charging Station, **2018** (sponsored by Raytheon, ≈$2,000)
- *Abdelmoula El Yazizi, Zach Cook, Chung Sunny Vu, Ian Robinson*, Smartphone GNSS antenna characterization, **2018** (sponsored by Raytheon, ≈$2,000)
- *Andrew Jones, Taylor Varnado, Damian Agee, Teddi Brown, Austin Byrd*, Infant monitor, **2018**
- *Bruce Bowlin, Eric Farmer, Joseph Hastings, Van Kingma, and Curtis Prehn*, Zotikon: Athlete Analysis System, **2017**
- *Joseph Aulds, Travis Barfield, Billy Baker, Joseph Cooley, Shivani Pacharne*, Holiday Light Show, **2017**
- *Aaron Shepard, Austin Ratcliffe, Conor Ferguson, Dylan Boyd, Dylan Neal*, Unmanned Aerial Vehicle Assisted Antenna Reception Testing (UAV-RT), **2017**
  (Led to a multi-million dollars start-up company) - WISPR Systems
- *Louie King, Derek Reeves, Nikhil Lokhande, Zach DiGennaro*, integrated Law Enforcement Automated Documentation (iLEAD), **2016**

STUDENT SUCCESS

- *Phong Nguyen, a First-Year Research Experience (FYRE) student at IMPRESS LAB, was awarded a CURO Summer Research Fellowship for Summer 2026 for his innovative undergraduate research. His project investigates a drone-mounted smartphone platform to sense soil moisture using GNSS Reflectometry (GNSS-R), with Structure from Motion (SfM) techniques incorporated to mitigate vegetation effects **2026**.*
- *The Team IMPRESS@UGA — K. Al Mahmud, J. Halder, B. Baray, and T. Anjum — achieved third place in the AERPAW Autonomous UAV Student Challenge 2, competing among 22 registered teams. Of those, 16 teams submitted projects for evaluation using the AERPAW digital twin, and 11 advanced as finalists for live testbed experiments at NCSU Lake Wheeler Field Labs **2025**.*
- *Abesh Ghosh was awarded a NASA Future Investigators in NASA Earth and Space Science and Technology (FINESST) Grant in **2025**.*
- *Students from IMPRESS LAB (A. Ghosh, E. Hoque, J. Halder, B. Baray, K. Al Mahmud, T. Anjum) won the fifth IEEE GRSS Student Grand Challenge in **2025**, ranking among the top 6 teams out of 32 international submissions. The student teams develop an end-to-end remote sensing application based on unmanned vehicles (e.g. drones, remote controlled planes or helicopters, underwater vehicles, rovers, stratospheric balloons. . .).*
- *Kaies Al Mahmud has been accepted for the **2025** CyberPowder Fellows Program. CyberPowder is an NSF-funded wireless networking hands-on training and research mentoring program for US-based graduate students.*
- *M. Ehsanul Hoque's paper, submitted to the 2025 URSI NRSM Student Paper Competition, has been selected as an *HONORABLE MENTION*. **2025**.*

- *Abesh Ghosh is selected as a finalist for IEEE IGARSS 3MT competition with his work on forest vegetation optical depth mapping using GNSS signals in **2024**.*
- *Md Mehedi Farhad was awarded a NASA Future Investigators in NASA Earth and Space Science and Technology (FINESST) Grant in **2023**.*
- *Md Mehedi Farhad was a **2023-2024** Outstanding Hall of Fame Student by the College of Engineering award winner as well as **2023-2024** Best ECE Graduate Researcher winner.*
- *Dylan Boyd was awarded a NASA Future Investigators in NASA Earth and Space Science and Technology (FINESST) Grant in **2021**.*
- *Dylan Boyd was a **2020-2021** Bagley College of Engineering and Office of Research and Development (ORED) Graduate Student award winner as well as **2020-2021** Best ECE Graduate Researcher winner.*
- *Preston Peranich was awarded Mississippi Space Grant Consortium (MSSGC) Graduate Fellowship, **2019** and **2020**.*
- *Orhan Eroglu was awarded a NASA Earth and Space Science Fellowship in **2018**.*
- *Abdelmoula Elyazizi was awarded a Office of Research and Economic Development (ORED) Undergraduate Research grant with $2,000 in **2018**.*
- *Cassie Myers and Grant Parker were awarded a CSpire and Nokia Bell Labs fellowship in **2017**.*

PROFESSIONAL ACTIVITIES

Editorial Service (reverse chronology)

- Associate Editor for IEEE Transaction on Geosciences and Remote Sensing, (2021–present)
- Associate Editor for IEEE Journal of Selected Topics in Applied Earth Observation and Remote Sensing, (2021–present)
- Associate Editor for URSI (International Radio Science Union) Radio Science Bulletin, (2014–2017)
- Editorial Champion, IEEE GRSS Remote Sensing Code Library (RSCL), (2016–2018)

Panel Service (reverse chronology)

2026 NSF Ad Hock Reviewer for Electrical, Communications and Computing Systems (ECCS), (June)
2025 NIST Communication Technologies Laboratory Panelist, (September)
2025 NSF Panelist for the Wireless Technologies SBIR/STTR Program, (February)
2024 NASA Peer Review Panelist for NASA-ISRO Synthetic Aperture Radar (NISAR) Mission Operations Science Team, (November)
2024 NASA Peer Review Panelist for Earth Science Technology Office (ESTO) Advanced Information Systems Technology (AIST) Program, (June)
2023 USDA Panelist for the Small Business Innovation Research (SBIR), (November)
2023 NSF Panelist for Graduate Research Fellowship Program (GRFP), (January)
2022 NASA Peer Review Panelist for Earth Surface and Interior Program, (October)
2020 NASA Peer Review Panelist for Soil Moisture Active-Passive Mission Science Team Program, (June)
2019 NASA Postdoctoral Program Panelist, (December)
2018 NSF Panelist for Electrical, Communications and Cyber Systems (ECCS) Spectrum Efficiency, Energy Efficiency, and Security (SpecEES) Program, (April)

Membership (reverse chronology)

- Member, USNC-URSI Commission F, (Jan. 2017–present)
- Member, IEEE GRSS Technical committee on Modelling in Remote Sensing (MIRS), (2015–present)
- Senior Member, The Institute of Electrical and Electronics Engineers (IEEE), (Sep. 2014–present)
- Member, IEEE Geoscience and Remote Sensing Society, (2008–present)
- Member, IEEE Antenna and Propagation Society, (2008, 2016–present)

- Member, The Institute of Navigation, (Apr. 2018–Oct. 2019)
- Member, IEEE Microwave Theory and Techniques Society, (2017–2018)
- Chapter Treasurer & Founding Member, IEEE Geoscience and Remote Sensing Society Turkiye Chapter, (2013–2015).

Committee Service

- Early Career Representative, URSI Commission F (Wave Propagation and Remote Sensing), (2014–2021)
- University Committees (reverse chronology)
  - Director of Graduate Studies, ECE, UGA, (2026–present)
  - Chair of ECE Faculty Search Committee, UGA, (2025–2026)
  - A member of Geography Faculty Search Committee, UGA, (2025–2026)
  - A member of ECE Executive Committee, UGA, (12/2025–present)
  - A member of CENGR Faculty Honorific Committee, UGA, (10/2025–present)
  - A member of Steering Committee for Institute for Integrative Precision Agriculture (IIPA) , UGA, (06/2025–present)
  - A member of Research Space Committee for the Science and Ag Hill Modernization, UGA, (04/2025–present)
  - Chair of ECE Faculty Search Committee, UGA, (2024–2025)
  - A member of Ad Hoc Graduate Program Review Committee, UGA, (2024–present)
  - A member of Graduate Students Committee, UGA, (2023–2026)
  - Chair of Communications and Electromagnetics Committee, MSU, (2019–2023)
  - A member of Graduate Students Committee, MSU, (2019–2021)
  - Co-chair of ECE Faculty Search Committee, MSU, (2020–2021)
  - A member of Ad Hoc Ph.D. Qualifier modification committee, MSU, (2020)
  - A member of Faculty Search Committee for the coast program, MSU, (2020)
  - A member of Department head Search Committee, MSU, (2019–2020)
  - Advisor to MSU Turkish Student Association, MSU, (2018–2019)
  - A member of Signal Processing and Communications Undergraduate Committee, MSU, (2016–2018)
  - A member of Undergraduate Students Committee, MSU, (2016–2018)

Referee Service

- Reviewer for Journals (listed alphabetically)
  - *International Journal of Remote Sensing*, 2017
  - *Journal of Applied Remote Sensing*, 2011-2014, 2016-2018, 2020
  - *IEEE Geosciences and Remote Sensing Letters*, 2010, 2011, 2013, 2016-2020
  - *IEEE Geoscience and Remote Sensing Magazine*, 2018
  - *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, 2012, 2014, 2020, 2021
  - *IEEE Transactions on Geosciences Remote Sensing*, 2011, 2014, 2016, 2017, 2019, 2020
  - *Remote Sensing of Environment*, 2010, 2014, 2016-2018, 2021, 2022
  - *MDPI Remote Sensing*, 2016-2020, 2022
  - *MDPI Sensors*, 2018
  - *URSI Radio Science Letters*, 2020
- Reviewer for Conferences (reverse chronology)
  - *IEEE International Geoscience and Remote Sensing Symposium*, 2016-2023, 2025
  - *The International Society for Photogrammetry and Remote Sensing, XXIV ISPRS Congress*, 2020
  - *XXXIV URSI General Assembly and Scientific Symposium (GASS)*, 2020
  - *IEEE Specialist Meeting on Microwave Radiometry and Remote Sensing of the Environment (MicroRAD)*, 2018, 2023
- Reviewer for Grants (reverse chronology)
  - *Dutch Research Council (NWO) Talent Programme – Vici scheme*, 2023

- *University Consortium Research Opportunity Program by Universities Space Research Association (USRA), in conjunction with the Air Force Research Laboratory (AFRL) and the U.S. Space Force (USSF)*, 2022
- *DoD's Science, Mathematics, and Research for Transformation (SMART) Scholarship-for-Service Program*, 2022
- *Mississippi NASA Space Grant Consortium Graduate Fellowship Program*, 2020
- *NASA Postdoctoral Program*, 2016, 2019

Conference Service (reverse chronology)

2025 **Session Co-Chair** for one technical session (entitled "Microwave Remote Sensing of Vegetation and Ocean Salinity in Honor of Roger H Lang") at the U.S. National Committee (USNC) for the International Union of Radio Science (URSI), 51st Annual National Radio Science MeetingPrague, Boulder (CO), Jan. 7–10.

2024 **Lecturer** for session on GNSS Reflectometry at IEEE-GRSS Soil Moisture School, the Budapest University of Technology and Economy (BME), in Budapest (Hungary) July. 14–17.

2023 **Session Co-Chair** for four technical sessions (entitled "Coexistence of Communication and Passive Sensing Technologies", "Active and/or Passive Microwave Remote Sensing for Soil Moisture", "Passive Microwave Radiometer Missions and Analysis", and "Advanced Microwave and Millimeter-Wave Radiometers and Calibration") at International Geosciences and Remote Sensing Symposium, Pasadena (CA), Jul. 16–21.

2023 **Session Co-Chair** for one technical session (entitled "Physical Modeling and Applications in GNSS+R with Application towards Sustainable Development Goal") at PhotonIcs and Electromagnetics Research Symposium, Prague (Czech Republic), Jul. 3–6.

2023 **Lecturer** for one session (entitled "Opportunities and challenges in GNSS-R") at GNSS Remote Sensing Colloquium, University Corporation for Atmospheric Research COSMIC, Boulder, Colorado, June 5–16.

2023 **Lecturer** for one session (entitled "Signals of Opportunity") at IEEE-GRSS Soil Moisture School, Indian Institute of Technology, Bombay (India), March. 15–17.

2022 **Panelist** for one technical session (entitled "Active-Passive Spectrum Coexistence") at 4th Buffalo Day for 5G and Wireless Internet of Things, Buffalo (NY), November 18.

2022 **Lecturer** for one session (entitled "Signals of Opportunity") at IEEE-GRSS Soil Moisture School, University of Massachusetts, Amherst (USA), July. 5–7.

2022 **Session Co-Chair** for one technical session (entitled "Physical Modeling and Applications in GNSS Reflectometry and other SoOp Observables") at PhotonIcs and Electromagnetics Research Symposium, Hangzhou (China), April. 25–29.

2021 **Session Co-Chair** for two technical sessions (entitled "Machine Learning and AI Methods for Soil Moisture Retrieval" and "Novel Mapping Schemes of Forests") at International Geosciences and Remote Sensing Symposium, Brussels (Belgium), Jul. 12–26.

2020 **Session Co-Chair** for two technical sessions (entitled "Remote Sensing for Crop Parameters I" and "Recent Advances in GNSS-Reflectometry: Cryospheric Applications and Novel Techniques") at International Geosciences and Remote Sensing Symposium, Waikoloa, Hawaii (USA), Jul. 19–24.

2019 **Session Co-Chair** for one technical session (entitled "GNSS-R and GNSS-RO for Environmental Monitoring") at The Institute of Navigation Pacific Positioning, Navigation and Timing (PNT), Honolulu, Hawaii (USA), Apr. 8–11.

2018 **General Lectures Committee Member**, URSI Atlantic Radio Science Conference (URSI AT-RASC), the Canary Islands (Spain) in May 28–Jun. 1, **2018**.

2017 **Session Co-Chair** for two technical sessions (entitled "Ocean Surface Remote Sensing" and "Microwave Models for Land") at International Geosciences and Remote Sensing Symposium, Forth Worth, TX (USA), Jul. 23–28.

2017 **Session Co-Chair** for one technical session (entitled "Microwave Remote Sensing of

Vegetation") at XXXIth URSI General Assembly and Scientific Symposium, Montreal (Canada), Aug. 19–26.

2015 **Session Co-Chair** for two technical sessions (entitled "Remote Sensing in Disaster Management 1&2") and one general lecture (entitled "Remote Sensing of Ocean Salinity") at URSI AT-RASC, the Canary Islands (Spain) in May 18–22.

2015 **General Lectures Committee Member**, URSI Atlantic Radio Science Conference (URSI AT-RASC), the Canary Islands (Spain) in May 28–22.

2014 **Session Co-Chair** for one technical session (entitled "Passive Remote Sensing") at XXXIth URSI General Assembly and Scientific Symposium, Beijing (China), Aug. 14–23.

2014 **Organization Committee Chair**, UYGU 2014 - The First Earth Observation Applications Summer School Gebze (Turkey), Jun. 23–27.

2012 **Session Co-Chair** for one technical session (entitled "Soil Moisture: Radar I") at International Geosciences and Remote Sensing Symposium, Munich (Germany), Jul. 22–27.

2010 **Session Co-Chair** for two technical sessions (entitled "Vegetation Mapping III" and "LAI, Reflectance, and Fluorescence") at International Geosciences and Remote Sensing Symposium, Honolulu, Hawaii (USA), Jul. 25–30.

2010 **Local Organizing Committee Member** for 11th IEEE Specialist Meeting on Microwave Radiometry and Remote Sensing of the Environment (MicroRAD), Washington, DC (USA), Mar. 1–4.

INTELLECTUAL PROPERTY

[1] Inventors: M. Kurum (75%) and A. Gurbuz (25%), Title of Invention: A methodology to map topsoil moisture from small, unmanned aircraft systems, Invention Disclosure Form submitted to OTM, September 30, 2020, **License Option Agreement** Signed, October **2020**.

BOOK CHAPTERS

[1] J. Rogers., L. Cagle, J. E. Ball, **M. Kurum**, and S. Z Gurbuz, "Application of deep learning to radar remote sensings," *in Deep Neural Network Design for Radar Applications*, Ed: Sevgi Z. Gurbuz, IET, Chapter 11, **2020**. doi:10.1049/SBRA529E_ch11

REFEREED JOURNAL PUBLICATIONS

Works with advisees (undergraduate and graduate students, postdocs) are indicated with their names being underlined.

[55] M. E. Hoque, D. R Boyd, S. Yadav, A. Ghosh , I. Fenni **M. Kurum**, "LiDAR-FoReST: LiDAR-derived Forest Framework for Radiowave propagation modeling in Subcanopy Transmissometry environment," *IEEE Transaction on Geosciences and Remote Sensing*, submitted for publication, **2026**.

[54] B. Baray, M. M. Farhad, A. Gurbuz, **M. Kurum**, "High Resolution Soil Moisture Estimation with UAS GNSS-R and Multimodal Remote Sensing" *IEEE Journal of Selected Topics in Applied Earth Observation and Remote Sensing*, submitted for publication , **2026**.

[53] D. Entekhabi, S. Yueh, R. Bindlish, M. Garcia, J. Entin, A. Colliander, M. J. Chaubell, R. S. Dunbar, L. Herwehe, J. Kimball, P. Mohammed, R. Reichle, N. Chung, E. Dinnat, H. Huang, S. J. Khalsa, D. Levine, S. Misra, L. Pashaian, J. Peng, J. Piepmeier, N. Rodriguez-Alvarez, T. Wang, X. Xu, E. Ahmadisharaf, R. Bras, C. Chen, A. Chen, N. Das, A. Ebtehaj, C. Frankenberg, J. Green, T. Keenan, J. Kolassa, A. Konings, R. Koster, S. Kumar, **M. Kurum**, M. Morris, R. Negron-Juarez, A. Petty, C. Potter, G. Salvucci, L. Tsang, M. Zhao, "The NASA Soil Moisture Active Passive (SMAP) Earth Observation Satellite Mission," *Proceedings of IEEE*, submitted for publication, **2026**.

[52] S. Yadav, **M. Kurum**, S. Singh, R. Prasad, "Analytically Modified Anisotropic First-order Radiative Transfer Model Calibration via X and L Band Bistatic Radar Measurements over Vegetation," *IEEE Transaction on Geosciences and Remote Sensing*, submitted for publication, **2026**.

[51] X. Xu, S. Yueh, D. Entekhabi, **M. Kurum**, "A Generalized Framework for Microwave Active–Passive Soil Moisture Disaggregation: Per-Pixel Forward Models and Application to SMAP–NISAR," *IEEE Transaction on Geosciences and Remote Sensing*, submitted for publication, **2026**.

[50] E. Jalilvand, S. Kumar, R. Bindlish, J.W. Wegiel, **M. Kurum**, H. Kim, P.-W. Liu, M. Navari, "Beyond SMAP: Can GNSS-R platforms ensure continuity of global soil moisture observations? ," *Water Resources Research*, accepted for publication, **2026**.

[49] M.E. Malik, Md.S. Mahmud, N.T. Basinger, **M. Kurum**, G.C. Rains, "Trajectory-Synchronized Diode Laser Actuation and Dose-Response Field Evaluation for Precision Weed Control Using a Delta Robot," *Computers and Electronics in Agriculture*, vol. 255, no. 112306, doi:10.1016/j.compag.2026.112306, **2026**

[48] A. M. Alam, **M. Kurum**, and A. Gurbuz, "RFI-Net: Enhancing Passive Sensing through Deep Learning Based Time-Frequency Domain Radio Frequency Interference Detection and Mitigation," *IEEE Transaction on Geosciences and Remote Sensing*, vol. 64, pp. 5301717, doi:10.1109/TGRS.2026.3710688, **2026**

[47] A. Ghosh, Md E. Hoque, M. M. Farhad, A. Gurbuz, A. Peduzzi, **M. Kurum**, "Deep Learning Framework For High Resolution Large-Scale Vegetation Optical Depth Mapping Using Airborne LiDAR and Mobile GNSS-T Data" *IEEE Journal of Selected Topics in Applied Earth Observation and Remote Sensing*, vol. 19, pp. 12087 - 12100, doi:10.1109/JSTARS.2026.3675561, **2026**

[46] M. S. Hossen, C. Dickerson, O. Ozdemir, A. Gurses, M. Rabeek Sarbudeen, T. Zajkowski, A. Manavi Alam, E. Tucker, W. Bjordnahl, F. Solis, S. Javad, A. Khamath, X. Tang, J. Jafor Sadiqe, K. Liu Hermstein, K. Al Mahmud, J. A. Sanchez Viloria, S. Hawkins, Y. Cui, A. Dey, Y. Liu, A. Gurbuz, J. Camp, R. Ahmad, J. van der Merwe, A. Ibrahim, M. Gil Zussman, **M. Kurum**, N. Kamesh, Z. Guan, D. Pados, G. Skliavantis, I. Guvenc, M. Sichitiu, M. Rudra Dutta, "UAV-Based Wireless Multi-Modal Measurements from AERPAW Autonomous Data Mule (AADM) Challenge in Digital Twin and Real-World Environments," IEEE Data Descriptions, vol. 3, pp. 354 - 366, doi:10.1109/IEEEDATA.2026.3685296, **2026**

[45] Y. Zhou, M. Schwank, J. Boutin, P. Richaume, A. Mialo, M. Holmberg, L. Kaleschke, P. Zeiger, M. Leduc-Leballeur, A. Ebtehaj, D. Kumawat, N. Rodriguez-Fernandez, E. Olmedo, A. Colliander, E. Dinnat, A. Feldman, **M. Kurum**, J. Lemmetyinen, K. Rautiainen, G. Picard, N. Reul, S. Hendricks, X. Tian-Kunze, R. Tonboe, C. Vittucci, M. Brogioni, K. Jezek, G. Macelloni, M. Drusch, J. Johnson, R. Lang, D. Le Vine, D. Entekhabi, Y. Kerr, "Satellite Microwave Radiometry at L-band for Monitoring Earth's Essential Climate Variables," *IEEE Geoscience and Remote Sensing Magazine*, in press, **2026**.

[44] A. Colliander, M. Schwank, Y. Zhou, **M. Kurum**, C. Vittuci, L. Tsang, A. Roy, and A. Berg, "A review of forward modelling and retrieval approaches for forest soil moisture and vegetation optical depth using L-band radiometry," *Remote Sensing of Environment*, vol. 334, no. 115158, doi:10.1016/j.rse.2025.115158, **2026**.

[43] E. Hodges, C. Chew, E. E. Small, D. Bai, M. Al-Khaldi, J. D. Ouellette, J. T. Johnson, F. Lei, **M. Kurum**, A. C. Gurbuz, V. Senyurek, M. M. Nabi, X. Xu, R. Shah, S. H. Yueh, A. Hayashi, P. T. Setti Jr., S. Tabibi, E. Santi, S. Pettinato, C. S. Ruf, M. Moghaddam, "A Merged CYGNSS Soil Moisture Product Using a Minimum Variance Estimator," *IEEE Transaction on Geosciences and Remote Sensing*, vol. 63, pp. 4415715, doi:10.1109/TGRS.2025.3597532, **2025**.

[42] M.M. Farhad, V. Senyurek, M.Rafi, S.B. Baray, C. McCraine, L.A. Hathcock, A. Adeli, H. Yanbo, A.C. Gurbuz, **M. Kurum**, "Integrating UAS-based GNSS-R, LiDAR, and Multispectral Data for Soil Moisture Estimation: Summary of Results from a Three-Year Long Field Campaign," *IEEE Journal of Selected Topics in Applied Earth Observation and Remote Sensing*," *IEEE Journal of Selected Topics in Applied Earth Observation and Remote Sensing*, vol. 18, pp. 16896 - 16915, doi:10.1109/JSTARS.2025.3580114 , **2025**.

[41] A. Colliander, M. H. Cosh, L. Bourgeau-Chavez, V. Kelly, S. Kraatz, P. Siqueira, V. A. Walker, X. Chen, A. Roy, T. Lakhankar, K. McDonald, N. Steiner, **M. Kurum**, S. Kim, A. Berg, X. Xu, A. Konings, S. Misra, C. Vittucci, J., D. Entekhabi, S. H. Yueh, "SMAP Validation Experiment 2019-2022 (SMAPVEX19-22) to Improve Soil Moisture and Vegetation Optical Depth Retrievals in Temperate Forests," *IEEE Journal of Selected Topics in Applied Earth Observation and Remote Sensing*, vol. 18, pp. 10749 - 10771, doi:10.1109/JSTARS.2025.3553085 , **2025**.

[40] A. Ghosh, M. M. Farhad, Md E. Hoque, D. R. Boyd, L. Bourgeau-Chavez, M. H. Cosh, A. Colliander, **M. Kurum**, "Estimating Vegetation Optical Depth with Mobile GNSS Transmissiometry in Temperate Forests During SMAPVEX'22" *IEEE Journal of Selected Topics in Applied Earth Observation and Remote Sensing*, vol. 18, pp. 6451 - 6463, doi:10.1109/JSTARS.2025.3541182 , **2025**.

[39] J. Jeong, L. Tsang, **M. Kurum** A. Ghosh, A. Colliander, S. Yueh, Simon, K. McDonald, N. Steiner M. H. Cosh, "Full-wave Simulations of Forest at L-band with Fast Hybrid Method and Comparison with GNSS Signals" *IEEE Journal of Selected Topics in Applied Earth Observation and Remote Sensing*, vol. 18, pp. 5395 - 5405, **2025**. doi:10.1109/JSTARS.2025.3533313

[38] Y. Zhou, M. Schwank, **M. Kurum**, D. Houtz, Q. Zhao, R. Lang, A. Mialon, and M. Drusch, "A Microwave Emission Model for Layered Vegetation (MEMLV): A Case Study for Boreal Forests from L- to Ka- band," *IEEE Transaction on Geosciences and Remote Sensing*, vol. 62, pp.4417220, **2024**. doi:10.1109/TGRS.2024.3491218

[37] A.M. Alam, M. M. Farhad, W. AlQwider, A. Owfi, M. Koosha, N. Mastronarde, F. Afghah, V. Marojevic, **M. Kurum**, A. Gurbuz, "A Physical Testbed and Open Dataset for Benchmarking of Passive Sensing and Wireless Communication Spectrum Coexistence" *IEEE Access*, vol. 12, pp. 131522 - 131540, **2024**. doi:10.1109/ACCESS.2024.3453774

[36] M. M. Nabi, V. Senyurek, **M. Kurum**, and A. Gurbuz, "Best Linear Unbiased Estimators for Fusion of Multiple CYGNSS Soil Moisture Products," *IEEE Journal of Selected Topics in Applied Earth Observation and Remote Sensing*, vol. 17, pp. 16108 - 16118, **2024**. doi:10.1109/JSTARS.2024.3443100

[35] Md. M. Farhad, A. M. Alam, S. Biswas, M. A. S. Rafi, A. C. Gurbuz, and **M. Kurum**, "SDR-Based Dual Polarized L-Band Microwave Radiometer Operating from Small UAS Platforms," *IEEE Journal of Selected Topics in Applied Earth Observation and Remote Sensing*, vol. 17, pp. 9389 - 9402, **2024**. doi:10.1109/JSTARS.2024.3394054

[34] A. Ghosh, Md. M. Farhad, D. R. Boyd, and **M. Kurum**, "A UGV-based Forest Vegetation Optical Depth Mapping Using GNSS Signals," *IEEE Journal of Selected Topics in Applied Earth Observation and Remote Sensing*, vol. 17, pp. 5093 - 5105, **2024**. doi:10.1109/JSTARS.2024.3365798

[33] D. R. Boyd, and **M. Kurum**, "A Nested Facet Method of the Kirchhoff Approximation for Large-Scale Land Scattering," *IEEE Transaction on Geosciences and Remote Sensing*, vol. 62, no. 2002915, **2024**. doi:10.1109/TGRS.2024.3369583

[32] J. L. Garrison, M. A. Vega, R. Shah, J. Mansell, B. Nold, J. Raymond, R. Banting, R. Bindlish, K. Larsen, S. Kim, W. Li, **M. Kurum**, J. Piepmeier, H. Khalifi, F. Tanner, K. Horgan, C. Kielbasa, S. R. Babu, "SNOOPI: Demonstrating Earth remote sensing using P-band signals of opportunity (SoOp) on a CubeSat," *Advances in Space Research*, vol. 73, no. 6, pp. 2855-2879, **2024**. doi:10.1016/j.asr.2023.10.050

[31] A. M. Alam, **M. Kurum**, M. Ogut, and A. Gurbuz, "Microwave Radiometer Calibration Using Deep Learning with Reduced Reference Information and Two-Dimensional Spectral Features," *IEEE Journal of Selected Topics in Applied Earth Observation and Remote Sensing*, vol. 17, pp. 748 - 765, **2024**. doi:10.1109/JSTARS.2023.3333268

[30] Md. M. Farhad, **M. Kurum**, and A. Gurbuz, "A Ubiquitous GNSS-R approach using spinning smartphone onboard a small UAS," *IEEE Journal of Selected Topics in Applied Earth Observation and Remote Sensing*, vol. 16, pp. 6568 - 6578, **2023**. doi:10.1109/JSTARS.2023.3294833

[29] S. Kim, J. Garrison, and **M. Kurum**, "Retrieval of Subsurface Soil Moisture and Vegetation Water Content: Sensitivity to SoOp-Reflectometry Parameters," *IEEE Transaction on Geosciences and Remote Sensing*, vol. 61, pp. 4502818, **2023**. doi:10.1109/TGRS.2023.3284800

[28] M. M. Nabi, V. Senyurek, F. Lei, A. Gurbuz, and **M. Kurum**, "Global Assessment of Deep Learning-based CYGNSS Soil Moisture Retrieval Against SMAP Observation," *IEEE Journal of Selected Topics in Applied Earth Observation and Remote Sensing*, vol. 16, pp. 5629 - 5644, **2023**. doi:10.1109/JSTARS.2023.3287591

[27] A. M. Alam, A. Gurbuz, and **M. Kurum**, "Radio Frequency Interference Detection for SMAP Radiometer Using Convolutional Neural Networks," *IEEE Journal of Selected Topics in Applied Earth Observation and Remote Sensing*, vol. 15, pp. 10099 - 10112, **2022**. doi:10.1109/JSTARS.2022.3223198

[26] V. Senyurek, Md. M. Farhad, A. Gurbuz, **M. Kurum**, and A. Ardeshir, "Fusion of Reflected GPS Signals with Multispectral Imagery to Estimate Soil Moisture at Sub-field Scale from Small UAS platforms," *IEEE Journal of Selected Topics in Applied Earth Observation and Remote Sensing*, vol. 15, pp. 6843 - 6855, **2022**. doi:10.1109/JSTARS.2022.3197794

[25] M. M. Nabi, V. Senyurek, A. Gurbuz, and **M. Kurum**, "Deep Learning-based Soil Moisture Retrieval in CONUS using CYGNSS Delay Doppler Maps," *IEEE Journal of Selected Topics in Applied Earth Observation and Remote Sensing*, vol. 15, pp. 6867 - 6881, **2022**. doi:10.1109/JSTARS.2022.3196658

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SEMINARS

2026 **M. Kurum**, "Recycling the Radio Spectrum for Science," Texas AM Univeristy Department of Biological and Agricultural Engineering, Jun. 10.

2025 **M. Kurum**, "Recycling the Radio Spectrum for Science," Graduate Seminar, University of Georgia, Oct. 10.

2025 **M. Kurum**, "Enabling science through spectrum coexistence, recycling, and sensing, "IEEE ISDL Workshop & Meeting Series, UNIVERSITY OF GEORGIA, IEEE ATLANTA Section & UGA GRSS Student Branch Chapter, Feb. 28.

2024 **M. Kurum**, "Unlocking Forest Vital Signs: Harnessing Microwave Remote Sensing with a Unified BERT Radiative Transfer Theory,"The IEEE Atlanta chapters of AES/GRS, IM/EMC, and AP/MTT, Dec. 4.

2024 **M. Kurum**, "Reflectometry Session: Recycling the Radio Spectrum for Science," IEEE GRSS Soil Moisture Summer School, the Budapest University of Technology and Economy (BME), in Budapest (Hungary) July. 14–17.

2024 **M. Kurum**, "Unveiling the Potential of GNSS Transmissometry (GNSS-T) for Remote Sensing of Forest Canopy Water Content: Challenges and Pathways to 'Radio Realistic' Forest Scene Generation," UGA IIPA Seminar Series, Jan. 30.

2023 **M. Kurum**, "Unveiling the Potential of GNSS Transmissometry (GNSS-T) for Remote Sensing of Forest Canopy Water Content: Challenges and Pathways to 'Radio Realistic' Forest Scene Generation," IEEE GRSS MIRS-TC Seminar, Dec. 21.

2023 **M. Kurum**, "Recycling the Radio Spectrum for Science: A New Paradigm for UAS-based Precision Agriculture," UGA AI and Data Science Seminar, UGA, Athens, GA, Sep. 9.

2023 **M. Kurum**, "Reflectometry Session: Recycling the Radio Spectrum for Science," IEEE GRSS Soil Moisture Summer School, IIT Bombay, India, Mar. 15-17.

2022 **M. Kurum**, "Reflectometry Session: Recycling the Radio Spectrum for Science," IEEE GRSS Soil Moisture Summer School, UMASS, Amherst, MA, Jul. 5-7.

2020 **M. Kurum**, "Microwave Remote Sensing," Smart Farming - Data Enable Ag class, MSU, Oct. 12.

2020 **M. Kurum**, "Can the GPS Chip on Your Phone Help Beat the Climate Change?," ECE Seminars, Webex, Sep. 18.

2020 **M. Kurum**, "A quasi-global machine learning-based CYGNSS soil moisture product at high spatio-temporal resolution ," NASA CYGNSS Science Team Meeting, WebEx, June 10.

2020 **M. Kurum**, "GPS-based Canopy Transmissivity Measurement," NASA SMAPVEX 19/20, Webex, Jan. 30.

2020 **M. Kurum**, "Recent progress on ML-based High Spatio-Temporal Resolution CYGNSS SM Retrievals," NASA CYGNSS Science Team Meeting, Pasadena, CA, Jan. 22.

2019 **M. Kurum**, "Microwave vegetation Scattering/Emission modeling," L-band Soil Moisture Continuity Workshop, NASA JPL, Pasadena, CA, March 6.

2019 **M. Kurum**, "Low-cost Reutilization of Existing Anthropogenic Signals for Remote Sensing," Distinguished Lecture Series, NASA JPL, Pasadena, CA, March 7.

2019 **M. Kurum**, "Low-cost Reutilization of Existing Anthropogenic Signals for Remote Sensing," Terrestrial Hydrology Seminar, NASA GSFC, Greenbelt, MD April 3.

2019 **M. Kurum**, "Low-cost Reutilization of Existing Anthropogenic Signals for Remote Sensing," NASA Stennis Space Center, MS, August. 6.

2019 **M. Kurum** and O. Eroglu, "High Spatio-Temporal Resolution CYGNSS Soil Moisture Estimates Using Artificial Neural Networks," NASA CYGNSS Science Team Meeting, University of Michigan, Ann Arbor, MI, June 5.

2019 **M. Kurum**, "Microwave Remote Sensing of Environment," Remote Sensing Seminar Class (W. Brien Henry's class), MSU, Mississippi State, MS, September. 12.

2018 **M. Kurum**, "Microwave Remote Sensing of Environment via Signals of Opportunity," Remote Sensing Seminar Class (W. Brien Henry's class), MSU, Mississippi State, MS, September. 12.

2018 **M. Kurum**, J. Ball, A. C. Gurbuz, P. Donohoe, "UAS-based Remote Sensing via Multiple Sensor Modalities," The US Army Corps of Engineers, Engineer Research and Development Center (ERDC), Vicksburg, MS, Aug. 17.

2018 **M. Kurum**, "Microwave Remote Sensing of Environment and Signals of Opportunity," IEEE GRSS Summer School, MSU, Mississippi State, MS, July. 10.

2017 **M. Kurum**, "Microwave Remote Sensing of Environment via Signals of Opportunity," Big Data Committee Meeting, MSU, Mississippi State, MS, Nov. 27.

2017 **M. Kurum**, "Microwave Remote Sensing of Environment," ECE Advisory Board Meeting, MSU, Mississippi State, MS, Mar. 30.

2016 **M. Kurum**, "Microwave Remote Sensing of Environment and Opportunities for Students," IEEE Student Branch Meeting, MSU, Mississippi State, MS, Oct. 5.

2016 **M. Kurum**, "Microwave Active/Passive Remote Sensing of Earth's Hydrological Features," University of Manitoba, Winnipeg, Canada, Jan. 15.

2015 **M. Kurum**, "Applied Electromagnetics: Remote Sensing Group," George Washington University, Washington, DC, Nov. 15.

2015 **M. Kurum**, "Microwave remote sensing of soil moisture under vegetation at L-band," Bilgi University, Istanbul (Turkey), Apr. 8.

2015 **M. Kurum**, "Microwave remote sensing of soil moisture under vegetation at L-band," Bogazici University, Istanbul (Turkey), Feb. 23.

2015 **M. Kurum**, "Microwave remote sensing of soil moisture under vegetation at L-band," Yildiz Technical University, Istanbul (Turkey), Jan. 30.

2014 **M. Kurum**, "SAR remote sensing of forest fires: Gallipoli forest fire in 2008," Gebze Technical University, Gebze, Kocaeli(Turkey), Jun. 12.

2012 **M. Kurum**, "Quantifying vegetation scattering in soil moisture retrieval algorithms," Institute Agrosphere IBG-3, Forschungszentrum Julich GmbH, Julich (Germany), Sep. 6.

2012 **M. Kurum**, "Microwave remote sensing of soil moisture through vegetation," TUBITAK UEKAE, Gebze, Kocaeli(Turkey), Jul. 27.

2012 **M. Kurum**, "Rederiving the tau-omega model for vegetated terrain at L-band," Terrestrial Water Cycle Seminar, NASA/GSFC, B33, Room A128, Greenbelt, MD (USA), Apr. 11.

2011 **M. Kurum**, "Microwave radiometry of forest canopies at L-band," TUBITAK UEKAE, Gebze, Kocaeli(Turkey), Aug. 10.

2011 **M. Kurum**, "Microwave radiometry of forest canopies at L-band," TOBB Economics and Technology University, Ankara (Turkey), Aug. 2.

2011 **M. Kurum**, "Effective tree scattering and opacity at L-band," Terrestrial Water Cycle Seminar, NASA/GSFC, B33, Room A128, Greenbelt, MD (USA), Jun. 22.

2011 **M. Kurum**, "Microwave radiometry of forest canopies at L-band," University of Maryland College Park, Earth System Sciences Interdisciplinary Center, College Park, MD (USA), Apr. 11.

2010 **M. Kurum**, "Active/Passive examination of deciduous and coniferous forests at L-band," NASA / Caltech Jet Propulsion Lab, Pasadena, CA(USA), Nov. 22.

2010 **M. Kurum**, "L-band brightness temperature for vegetated landscapes: comparison of approximate techniques," Second 2010-2011 meeting of the National Capital Section of the Optical Society of America, NASA/Goddard Visitors Center, Greenbelt, MD (USA), Oct. 19, **2010**.

2008 **M. Kurum**, "Estimation of canopy attenuation at L-band by a time domain analysis of radar backscatter response," Electromagnetics Seminar, NASA/GSFC, Greenbelt, MD (USA), Feb. 13.

2008 **M. Kurum**, "Radiometer sensitivity analysis," ComRAD meeting, USDA ARS Hydrology and Remote Sensing Lab, Beltsville, MD (USA), Mar. 6.

2007 **M. Kurum**, "Analysis of Radar/Radiometer measurements over calm water," ComRAD meeting, USDA ARS Hydrology and Remote Sensing Lab, Beltsville, MD (USA), Nov. 6.

2006 **M. Kurum**, "Design of an L-band radiometer calibration target," ComRAD meeting, USDA ARS Hydrology and Remote Sensing Lab, Beltsville, MD (USA), May 31.

2006 **M. Kurum**, "L-band radiometer development," Electromagnetics Seminar, NASA/GSFC, Greenbelt, MD (USA), Apr. 11.

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