

Nikhil Lane

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SUMMARY

Electrical and computer engineering researcher with six years of doctoral and postdoctoral research experience in **environmental remote sensing**, microwave instrumentation, RF systems, signal processing, and electromagnetic sensing. Work covers **active and passive measurements**, instrument characterization, retrieval workflows, calibration, uncertainty analysis, and payload concepts for **resource constrained platforms** including UAVs and small satellites. Research contributions connect laboratory methods with field ready experiments, **peer reviewed scholarship**, sponsored project proposals, and interdisciplinary collaboration. Teaching experience includes signals and systems, signal processing, electromagnetics, electronics, laboratory instruction, and technical problem solving. Graduate and undergraduate mentoring has supported careful measurement practice, inclusive development, clear documentation, and defensible engineering results. Scholarly goals center on externally funded environmental sensing, creative curricula, collaborative instrument development, and meaningful service across academic and professional communities.

EXPERIENCE

Postdoctoral Research Fellow, Remote Sensing Systems August 2024 - Present
Front Range Atmospheric Research Center *Boulder, CO*

- Lead **environmental remote sensing** research spanning microwave instruments, atmospheric and surface measurements, compact payload concepts, sponsored proposals, and interdisciplinary scholarship.
- Led microwave sensing studies connecting calibration strategy with atmospheric and surface retrieval objectives.
 - Evaluated compact RF **payload concepts** against power, mass, antenna, sampling, and data quality constraints.
 - Prepared sponsored research proposal sections covering aims, validation plans, equipment, collaboration, and dissemination.
 - Designed RF **calibration** experiments producing traceable datasets for peer reviewed **environmental sensing** analysis.
 - Mentored graduate and undergraduate researchers through measurement planning, **signal processing**, **uncertainty analysis**, and technical presentations.
 - Published remote sensing results with electrical engineering and environmental science collaborators across interdisciplinary research teams.

Doctoral Researcher, Electrical Engineering and Remote Sensing August 2020 - July 2024
University Research Lab *Fort Collins, CO*

- Developed **microwave remote sensing** platforms and experimental methods while advancing scholarship, sponsored project reporting, student guidance, and reproducible analysis.
- Developed microwave testbed integrating RF components, **data acquisition**, calibration routines, and **signal processing** scripts.
 - Compared active and passive sensing approaches using reference measurements and **uncertainty analysis** for environmental conditions.
 - Modeled electromagnetic behavior to refine instrument configurations and identify follow on research questions.
 - Produced peer reviewed manuscripts linking instrument design decisions with remote sensing performance and reproducible methods.
 - Guided junior researchers through laboratory safety, equipment setup, data checks, and technical writing.
 - Synthesized experimental results, literature context, technical risks, and research objectives for sponsored project reporting.

Graduate Research Assistant, RF Instrumentation August 2018 - July 2020
University Research Lab *Fort Collins, CO*

- Built RF measurement assemblies and scientific computing workflows for graduate research, field preparation, experimental validation, and interdisciplinary communication.
- Built RF measurement assemblies and verified component behavior through network and spectrum measurements.
 - Implemented **MATLAB** and **Python** workflows for filtering, spectral analysis, visualization, and repeated measurement comparison.
 - Prepared field campaigns with documented configurations, calibration steps, sampling plans, and data procedures.
 - Investigated anomalous measurements through controlled bench tests and documented corrective actions.
 - Presented electromagnetic and **signal processing** findings during laboratory reviews and engineering seminars.
 - Mentored undergraduate project students on RF fundamentals, experimental records, and analysis practices.

Graduate Teaching Assistant, Electrical and Computer Engineering August 2017 - May 2018
University Teaching Program *Fort Collins, CO*

- Supported undergraduate **engineering education** through laboratory **teaching**, office hours, assessment, practical examples, and guidance for varied student preparation levels.
- Supported **signals and systems** laboratories through workshops, office hours, feedback, and practical demonstrations.
 - Developed examples connecting Fourier analysis, sampling, propagation, and measurements with engineering applications.
 - Evaluated laboratory reports using rubrics focused on reasoning, documentation, and interpretation of results.
 - Guided student teams through **electronics** and signal analysis exercises with systematic troubleshooting.

- Adapted explanations and practice problems during office hours for students with varied preparation.
- Shared student questions during course planning discussions, informing clearer laboratory guidance and explanations.

PROJECTS

Environmental Microwave Sensing Testbed 📅 2024

Created a repeatable platform for controlled environmental measurements, combining RF components, calibration, data acquisition, and signal processing for defensible sensing research.

Compact Remote Sensing Payload Concepts 📅 2025

Evaluated small satellite and UAV payload ideas through power, mass, antenna, sampling, and data quality tradeoffs for resource constrained platforms.

LEADERSHIP & AWARDS

- Graduate Research Excellence Award, Colorado State University, 2023
- Outstanding Engineering Teaching Assistant Recognition, 2018
- Session Chair, Regional Remote Sensing Research Symposium

EDUCATION

Ph.D. in Electrical Engineering

2024

Colorado State University GPA: 0

Fort Collins, CO

Coursework: Remote sensing systems, electromagnetics, signal processing, environmental sensing

Bachelor of Science in Electrical Engineering

2017

University of New Mexico GPA: 0

Albuquerque, NM

Coursework: Electronics, electromagnetics, signal processing, RF systems

CERTIFICATIONS

- Responsible Conduct of Research Training 📅 2023
- Graduate Teaching Assistant Training 📅 2018

TECHNICAL SKILLS

- **Remote Sensing Systems:** Microwave remote sensing, optical remote sensing, active sensing
- **Environmental Sensing:** Land sensing, water sensing, atmospheric sensing
- **RF Instrumentation:** RF measurement, network analysis, spectrum analysis
- **Signal Processing:** MATLAB, Python, filtering
- **Electromagnetics:** Electromagnetic modeling, propagation, antenna analysis
- **Experimental Methods:** Experimental design, calibration, uncertainty analysis
- **Payload Engineering:** Small satellites, UAVs, resource constrained platforms
- **Research Communication:** Peer reviewed manuscripts, conference presentations, technical writing
- **Academic Teaching:** Electronics, signal processing, electromagnetics
- **Research Funding:** Proposal development, sponsored projects, external funding
- **Scientific Computing:** MATLAB, Python, data visualization
- **Academic Service:** Faculty governance, committees, professional service

SKILLS

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|---------------------|--------------------------|--------------------|------------------------|
| • Remote Sensing | • Signal Processing | • Payload Concepts | • Calibration |
| • Microwave Sensing | • Active Sensing | • MATLAB | • Experimental Design |
| • RF Systems | • Passive Sensing | • Python | • Proposal Development |
| • Electromagnetics | • Instrument Development | • RF Measurement | |

PROFESSIONAL AFFILIATIONS

- Graduate Research Mentor, Electrical Engineering Research Community
- Regional Remote Sensing Research Symposium, Session Chair
- Interdisciplinary Environmental Sensing Research Collaboration

LANGUAGES

- English (Native)
- Spanish (Intermediate)

ADDITIONAL INFORMATION

Work Status : Authorized to work in United States. No sponsorship required.

REFERENCES

AVAILABLE ON REQUEST