

# Zain Clark

## Senior Researcher, Electromagnetics

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📍 Hartford, CT 06103

### STRENGTHS

- ⚙️ **Concept to prototype**  
Turned early RF ideas into modeled, fabricated, and measured demonstrations. A clear test plan kept research moving.
- ♥️ **Measurement discipline**  
Built repeatable characterization plans and compared predictions with data. Colleagues relied on those results during design reviews.
- 👥 **Multidisciplinary research**  
Connected engineers, physicists, and materials researchers around shared device goals. Unexpected issues became useful design evidence.
- 📌 **Technical communication**  
Translated complex electromagnetic findings into proposals, papers, reports, and invention disclosures that gained research leadership confidence.
- 🎓 **Research mentorship**  
Guided junior researchers through modeling, fabrication, testing, and analysis. Questions became stronger experiments and cleaner documentation.

### SKILLS

Electromagnetics   RF Circuits

Wave Propagation   Antenna Arrays

Computational Electromagnetics

Radar Signal Processing

Remote Sensing   RF Photonics

Imaging Systems

Communications Networks

Prototype Fabrication

Experimental Methods

Research Proposals

### SUMMARY

Senior **electromagnetics** researcher with 9 years advancing RF and microwave technologies through computational modeling, prototype fabrication, experimental characterization, and technical publication. Holds a Ph.D. in Electrical Engineering with deep experience in fundamental electromagnetism, wave propagation, RF circuits, **wave material interactions**, antennas, antenna arrays, **computational electromagnetics**, radar, remote sensing, imaging, communications, RF photonics, and functional materials. Leads research from early concept formation through **proof of concept** demonstrations, connecting simulation, fabrication, measurement, and multidisciplinary analysis. Develops technical proposals, reports, conference papers, peer reviewed articles, invention disclosures, and project plans. Mentors researchers, coordinates laboratory programs, resolves design tradeoffs, and communicates findings clearly across engineering, physics, program, and research leadership audiences.

### EXPERIENCE

#### Senior Research Scientist, Electromagnetics

Helios Advanced Systems 📅 January 2023 - Present 📍 Hartford, CT

Leads applied electromagnetics research for RF sensing and communications concepts, guiding simulation, fabrication, measurement, publication, proposal, and multidisciplinary delivery activities.

- Led RF sensing research from analytical models through fabricated prototypes and laboratory measurements.
- Designed antenna array studies using **computational electromagnetics** and circuit analysis before fabrication.
- Characterized **wave material interactions** through repeatable measurements and prediction comparisons.
- Connected RF devices with photonic and functional material concepts for **aerospace** sensing.
- Authored **reports**, papers, invention disclosures, and proposal sections for **research programs**.
- Mentored junior researchers across modeling, **fabrication**, testing, data analysis, and documentation.

#### Research Scientist, RF and Electromagnetics

Northstar Applied Physics Laboratory 📅 July 2020 - December 2022 📍 Boston, MA

Developed antennas, RF circuits, electromagnetic models, and proof of concept experiments supporting radar, remote sensing, imaging, and communications research programs.

- Developed antennas and **RF circuits** for radar, **remote sensing**, and communications programs.
- Built multi domain workflows linking full wave behavior with RF circuit response.
- Planned calibrated experiments that identified loss mechanisms in microwave components.
- Investigated emerging RF materials for compact sensing, **imaging**, and **communications** architectures.
- Contributed work plans, risk assessments, and technical narratives to research **proposals**.
- Converted validated findings into conference submissions, reports, and **intellectual property** documentation.

#### Electromagnetics Research Engineer

Pioneer Microwave Research Institute 📅 June 2018 - June 2020 📍 Worcester, MA

Performed computational and experimental research on RF and microwave components, translating system needs into reproducible device targets and measurement workflows.

- Created antenna and passive RF models for engineered material prototypes.
- Compared computational predictions with vector network analyzer and chamber measurements.
- Designed fixtures and test procedures that improved prototype characterization traceability.
- Analyzed **radar** and **communications** use cases for device level research targets.
- Maintained notebooks, analysis scripts, figures, and summaries for design reviews.
- Resolved fabrication and measurement issues with physicists and electrical engineers.

#### Graduate Researcher, Applied Electromagnetics

Technical Writing

Project Management

## LANGUAGES

English Native

Spanish Intermediate

## MY CAREER



● Senior Research Scientist, Electromagnetics at Helios Advanced Systems (3.8 Years)

● Research Scientist, RF and Electromagnetics at Northstar Applied Physics Laboratory (2.4 Years)

● Electromagnetics Research Engineer at Pioneer Microwave Research Institute (2 Years)

● Graduate Researcher, Applied Electromagnetics at University Research Lab (1.8 Years)

University Research Lab 📅 August 2016 - May 2018 📍 Amherst, MA

Supported supervised graduate research in **antennas, RF circuits**, computational modeling, fabrication, measurement, and technical communication for sensing applications.

- Implemented full wave models for radiating and guided wave structures.
- Evaluated frequency response, electromagnetic fields, and material sensitivity through **simulation**.
- Fabricated laboratory prototypes and compared measured performance with simulated results.
- Investigated **wave propagation** through controlled experiments with documented uncertainty.
- Prepared figures and technical sections for journal and conference manuscripts.
- Coordinated laboratory equipment, datasets, schedules, and multidisciplinary research communication.

## PROJECTS

### RF Photonic Sensing Demonstrator 📅 2024

A small modeling result revealed a practical sensing path. Connected RF structures, photonic concepts, and functional materials through simulation and laboratory evaluation for an aerospace oriented proof of concept.

### Antenna Array Characterization Program 📅 2022

Array coupling became the central design question. Combined computational electromagnetics, circuit analysis, fabrication, and calibrated measurements to refine bandwidth and radiation performance.

## LEADERSHIP & AWARDS

- Research leadership recognition for advancing RF sensing and communications concepts from models through laboratory proof of concept demonstrations.
- Technical publication recognition for peer reviewed articles, conference proceedings, reports, and invention disclosures in applied electromagnetics.
- Mentorship leadership for guiding junior researchers across simulation, fabrication, measurement, analysis, and documentation.

## EDUCATION

### Ph.D. in Electrical Engineering

University of Massachusetts Amherst 🎓 GPA: 4.0 📅 2018 📍 Amherst, MA

**Coursework:** *Electromagnetics, RF circuits, antenna theory, computational modeling*

### Bachelor of Science in Electrical Engineering

University of Connecticut 🎓 GPA: 4.0 📅 2013 📍 Storrs, CT

**Coursework:** *Electromagnetic fields, microwave engineering, circuit analysis, signal processing*

## CERTIFICATIONS

- Export Control Awareness 📅 2024
- Laboratory Safety Training 📅 2023

## TECHNICAL SKILLS

- **Electromagnetic Modeling:** Computational electromagnetics, full wave simulation, multi physics modeling
- **RF Circuit Design:** RF circuits, microwave circuits, active circuits
- **Antenna Engineering:** Antennas, antenna arrays, radiation analysis
- **Wave Analysis:** Wave propagation, wave material interactions, guided waves
- **Radar Systems:** Radar signal processing, radar sensing, radar imaging
- **Remote Sensing:** Remote sensing, imaging systems, aerospace sensing
- **RF Photonics:** RF photonic circuits, photonics, optical interfaces
- **Materials Research:** Functional materials, engineered materials, emerging structures

- **Experimental Testing:** Vector network analyzer, chamber measurements, calibrated measurements
- **Research Delivery:** Proof of concept, prototype fabrication, technology readiness
- **Technical Communication:** Research reports, conference proceedings, peer reviewed articles
- **Intellectual Property:** Invention disclosures, patent support, technical documentation

## PROFESSIONAL AFFILIATIONS

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- Institute of Electrical and Electronics Engineers, electromagnetics and microwave research community participant.
- Applied Physics research network participant, supporting multidisciplinary exchange across RF, photonics, materials, and sensing.

## ADDITIONAL INFORMATION

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

## REFERENCES

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AVAILABLE ON REQUEST