Christopher Kniss

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EDUCATION

Ph.D. in Electrical Engineering **Fall 2025 – Present**
University of Massachusetts Amherst
Direct Ph.D. Program | Advisor: Dr. Rod Kim | Research Assistantship

B.E. in Computer Engineering (with Highest Honors) **May 2025**
Stevens Institute of Technology, Hoboken, NJ
Concentration: Electronics & Embedded Systems | Minor: Physics
Cumulative GPA: 3.959

PUBLICATIONS

Temperature-Compensated Multi-Level CMOS Modulators Operating from 10 K to 300 K for Cryogenic Interconnects
C. Kniss, A. Sharma, R. Phon, G. Shimonov, E. Socher, P. R. Shrestha, K. Ramu, J. P. Campbell, A. Pourvali Kakhki, R. Al Hadi, R. Kim
IEEE Journal of Microwaves (JMW), October 2025

- Presented temperature-compensated cryogenic CMOS modulators operating from 10 K to 300 K for scalable cryogenic communications in quantum and high-performance computing applications
- Implemented current-steering 2-bit modulator in 65 nm bulk CMOS achieving 13 Gb/s at 10 K with 15.4 mW power and 1.18 pJ/b energy efficiency
- Demonstrated 150 GHz transmitter in 28 nm CMOS and established contactless connections achieving 8 Gb/s between 10 K and 300 K systems

Ceramic Fiber Interconnects Beyond 1000° C Enabled by Automatic Gain Compensated Millimeter-Wave CMOS Transceivers
A. Sharma, C. Kniss, R. Phon, R. Kim
2025 IEEE International Symposium on Circuits and Systems (ISCAS), pp. 1–5, May 2025

- Investigated hollow-core ceramic alumina fiber for millimeter-wave communications at temperatures up to 1100 °C for aerospace and extreme environment electronics applications
- Measured EM wave propagation through alumina fiber across 50–75 GHz range demonstrating stable transmission after one hour at 1100 °C
- Implemented automatic gain control loop paired with 57 GHz CMOS transceiver achieving 5 Gb/s data rate at extreme operating conditions

RESEARCH EXPERIENCE

Undergraduate Research Assistant, SINE Lab **Jan 2024 – May 2025**
Stevens Institute of Technology | Provost's Office of Undergraduate Research

- Contributed 15 hours/week in-person lab work studying economic implications in RFIC design, fabrication, and implementation
- Designed and simulated analog folding amplifier operational up to 100 MHz in Cadence, applying device physics to debugging and transistor sizing
- Practiced poster presentation skills and improved independent study, circuit design, and project management abilities
- Conducted extreme temperature experiments up to 1100°C characterizing S-parameters using vector network analyzer for high-temperature alumina fiber waveguide project

NIST SURF Program Intern **May 2025 – August 2025**
National Institute of Standards and Technology, Gaithersburg, MD

- Developed PCBs in Altium Designer for mounting in cryogenic chambers supporting quantum computing research infrastructure
- Gained hands-on experience with probing stations, VNAs, oscilloscopes, and signal generators in cryogenic and non-cryogenic environments
- Presented research findings at NIST SURF Colloquium demonstrating technical communication with broad scientific audience

PROFESSIONAL EXPERIENCE

Teaching Assistant, Electronic Circuits Course **Sep – Dec 2023**
Stevens Institute of Technology
- Hosted optional recitations, graded assignments, and proctored exams for class of 44 students
- Crafted practice problems and planned recitations reviewing important course content with consistent attendance of 20–30 students

TECHNICAL PROJECTS

High-Performance Computing Server Design **Sep 2025**
- Designed and optimized component selection for $42K lab server configured to support 3 concurrent users running HFSS and Cadence workflows
- Increased lab productivity and enabled large-scale simulations for research group

Speaker Spine – Smart Home Audio System **Senior Design Project**
- Developed brand-agnostic smart home audio system as part of 6-person team integrating electronics design and embedded systems

CONFERENCE PRESENTATIONS

Inaugural Riccio College of Engineering Innovation Day **November 2025**
University of Massachusetts Amherst | Poster Presentation

NIST SURF Colloquium **July 2025**
Gaithersburg, MD | Oral Presentation

Folding Amplifier Project Poster Presentation **Spring 2025**
Stevens Institute of Technology

iCNS Launch Event – High-Temperature Alumina Fiber Waveguide Demo **Fall 2023**
Stevens Institute of Technology

AWARDS & HONORS

Dean's List, Stevens Institute of Technology
Edwin A. Stevens Scholarship, Stevens Institute of Technology
Provost's Office Undergraduate Research Fund, Stevens Institute of Technology
Tau Beta Pi – Alpha Chapter
IEEE Eta Kappa Nu (HKN)

TECHNICAL SKILLS

Software: Cadence, Git, Altium Designer, Renesas E2 Studio, MATLAB, Vivado, Arduino, SolidWorks, MS Office

Programming: C and C++ (Experienced), Linux CLI, VHDL, x86 and ARMv8 Assembly, Java (Proficient)

SELECTED COURSEWORK

Graduate (UMass Amherst): Electromagnetic Field Theory

Undergraduate (Stevens): Intro. VLSI Design, Electronic Circuits, Design of Dynamical Systems, Digital System Design, Electromagnetism, Thermodynamics, Quantum Mechanics, Digital & Computer System Architecture, Real-Time & Embedded Systems, Microprocessor Systems, Computational Data Structures and Algorithms