Hyunseo Lee

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Summary

Specializing in Analog/Mixed-Signal, RFIC, and Computational Electromagnetics with hands-on experience in nonlinear RF systems, power amplifiers, and EM co-simulation. Seeking Summer 2026 internships in Analog/Mixed IC, RFIC, RF Systems, and EM design. Technical portfolio available on personal website.

EXPERIENCE

SUBLIME (Computational EM for Neurostimulation) Lab Fall 2025 – Present

Graduate Research Student Purdue University, West Lafayette

- Designed a mice-scale TMS coil operating at $\sim$3 kHz with peak currents up to 3 A, optimizing field focality, efficiency, and thermal performance via FEM (expected publication 202526).
- Developing thesis on focality optimization of TMS coils using parametric FEM sweeps and multi-objective optimization.

Magnetic Resonance Biomedical Engineering Lab (MRBEL) Fall 2021 – May 2023

Undergraduate Researcher Purdue University, West Lafayette

- Designed and tuned a 128 MHz single-loop RF MRI surface coil, implementing matching, tuning, and active detuning networks to achieve $S_{11} < -20$ dB at resonance.
- Fabricated flexible copper coils using LPCK PCB milling; quantified image SNR improvements in microDicom across multiple geometries.
- Presented at Purdue Spring 2022 URC: “Analysis of Single-Loop Surface Coil Geometries for MRI.”

RELEVANT PROJECTS

Allen Katz High Efficiency Power Amplifier (HEPA) IEEE MTT-S IMS Spring 2026

- Led a student team to design a 110 GHz high-efficiency PA delivering 440 W output power while satisfying C/I $\geq$ 30 dB at 0 dBm/tone under two-tone testing per IMS rules.
- Characterized PAE, C/I, ACPR, and drain efficiency using two-tone sweeps from 021 dBm/tone; extracted the lowest input power meeting the 30 dB C/I threshold for peak PAE scoring.

High-Speed Mixed-Signal Design: LNA / PLL Spring 2026

- Designed and simulated RF LNA and PLL blocks in Cadence Virtuoso, evaluating gain, noise figure, phase noise, stability, and PVT robustness.

ECE 604 RF Design Fall 2025

- Designed 2.45 GHz impedance matching networks, microstrip filters, and RF front-ends using Smith charts, link budgets, and ADS schematic/layout workflows with Momentum EM co-simulation.
- Performed AC, noise, harmonic balance, two-tone, and budget analyses to extract S-parameters, NF, linearity (P1dB/TOI/SOI), phase noise, and Shannon capacity.

EDUCATION

Purdue University Expected May 2027

M.S., Electrical and Computer Engineering (Thesis Track) West Lafayette, IN

- Relevant Courses: ECE 695 High-Speed Design; ECE 604 RF Design; ECE 60420 RFIC; ECE 604 EM Theory.

Purdue University Fall 2019 – May 2023

B.S., Biomedical Engineering | *Minor: Electrical and Computer Engineering* West Lafayette, IN

- Major GPA: 3.75 / 4.00

Awards / Fellowships / Assistantships

Graduate Teaching Assistantships Spring 2026

- ECE 604: Electromagnetic Theory led weekly office hours and authored graded solution sets for $\sim$120 students.

Undergraduate Teaching Assistantships Spring 2021 – Fall 2021

- BME 207: Bioinstrumentation and Circuits instructed labs on circuit analysis, oscilloscopes, power supplies, and ECG acquisition.

Purdue SURF ChanLab Summer 2021

- Evaluated automated trabecular/cortical segmentation by sweeping MATLAB parameters (sphere size, binarization, spoke count); $5,000 fellowship.

Dean's List Fall 2019 – Spring 2022

Engineering World Health Electrical Design Lead Fall 2020 – May 2023

- EWH 2022 Honorable Mention (4th): designed a ceiling-mounted surgical lamp with backup power.
- Implemented automatic transfer switching and validated prototypes using automotive batteries under load.

SKILLS

Programming: Python (NumPy, Pandas, Matplotlib), MATLAB, C
RF/EM: RF coil design, transmission lines, nonlinear PA metrics (PAE, C/I, ACPR), S-parameters, VNA
Tools: Keysight ADS (Momentum EM), Cadence Virtuoso, PCB CAD, Fusion 360, MRI Secondary Operator