

# TITUS HYUNKYU LEE

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## EDUCATION

**University of Virginia**, School of Engineering and Applied Science, Charlottesville, VA  
B.S. in Electrical Engineering and Computer Engineering, Minor in Business.

August 2023 - May 2027

- Cumulative GPA: 3.93/4.0.
- Recipient, A. James Clark Scholars Program at UVA, Clark Scholar (one of 17).
- Activities: Tau Beta Pi Engineering Honor Society, Theta Tau Professional Engineering Fraternity, Taekwondo Club.
- Study Abroad: UVA in Guatemala (Summer 2024) - Engineering, Public Health, and Development.

## RESEARCH & TECHNICAL EXPERIENCE

*Embedded Systems Engineer (Industry Project)*, **Interel**, Dubai, United Arab Emirates

December 2025 - January 2026

- Implemented embedded firmware and sensor interfaces on an ESP32 Feather microcontroller with a Bosch BME688 gas sensor, collecting and labeling 80+ data samples to train a neural-net-based gas classification model using Bosch BME AI-Studio.
- Validated real-time clean air vs. smoking/vaping classification on hardware and assessed integration constraints for Interel's EOS2 smart thermostat, delivering system-level integration recommendations.

*Research Intern*, **Daegu Gyeongbuk Institute of Science and Technology**, Daegu, South Korea

June 2025 - August 2025

- Researched over 20 peer-reviewed papers on triboelectric nanogenerators (TENGs), analyzing operating modes and material-performance correlations; fabricated vertical contact-separation and single-electrode TENG prototypes with surface treatments validated by contact angle measurements.
- Developed a self-powered intruder alert system using a TENG sensor and microcontroller for real-time motion detection. Processed signals with LabVIEW, visualized data in MATLAB, and validated output using an electrometer and oscilloscope. Shadowed SEM and XRD workflows for surface/morphology insights and delivered three technical presentations.

*Teaching Assistant, ECE 2700: Signals & Systems*, **University of Virginia**, Charlottesville, VA

August 2025 - Present

- Selected as an undergraduate TA; assisted students with problem sets and core concepts such as Fourier transforms, convolution, and LTI systems through weekly office hours, review sessions, and grading support.

## HARDWARE & EMBEDDED PROJECTS

**RoboSub at UVA – Electrical Subteam (Founding Member)**

Fall 2025 - Present

- Supported electrical and embedded subsystem design for an autonomous underwater vehicle, including system-level benchmarking, power distribution, motor control, and sensor integration under competition constraints.

**Discrete BJT Audio Synthesizer – Analog Electronics**

Fall 2025

- Designed and analyzed a fully discrete BJT-based operational amplifier and implemented it as a relaxation oscillator to generate audible signals; applied biasing, feedback, and small-signal principles to achieve stable oscillation.
- Integrated potentiometer-controlled tuning to adjust oscillation frequency and output amplitude, driving a speaker and validating performance through time- and frequency-domain analysis of the output waveform.

**Embedded Music Player – LP-MSPM0G3507**

Fall 2025

- Developed an embedded music player on the LP-MSPM0G3507 microcontroller and booster pack; read and applied device datasheets to configure GPIO, timers, and interrupts at the peripheral level for button-controlled playback and pause functionality.
- Implemented a finite state machine (FSM) to manage system states and timing behavior, using hardware timers to sequence pre-coded audio output and validate reliable real-time operation.

**Audio Analyzer PCB – Hardware**

Spring 2025

- Designed and fabricated a real-time audio analyzer PCB indicating bass and treble frequencies; implemented a signal chain with a summing amplifier, Sallen-Key filters (650 Hz & 2 kHz), and peak detectors.
- Integrated analog and PWM LED drivers using discrete components and MOSFETs to control brightness; verified dynamic LED response through Multisim circuit simulations and live testing with audio input.

## SKILLS

- Programming Languages: Python, C, C++, Java, VHDL, JavaScript, Bash, x86 Assembly.
- Tools & Software: Code Composer Studio, KiCad, Quartus, NI Multisim, LabVIEW, MATLAB, Fusion 360, Git, Linux.
- Relevant Coursework: Signals & Systems, Embedded Systems, Microelectronics, Applied Circuits, Electronics, Computer Architecture & Design (upcoming), Computer Systems & Organization II (upcoming), Intro to VLSI (upcoming), Digital Logic Design; additional coursework in Machine Learning, Data Structures & Algorithms, and Discrete Mathematics.
- Languages: English (Native), Korean (Native).

## OTHER EXPERIENCE

*Volunteer Mentor, Computer4Kids*, Charlottesville, VA

August 2024 - Present

- Provided one-on-one mentoring to middle school students, guiding hands-on STEM-related projects, fostering technical and presentation skills, and encouraging problem-solving and teamwork.

*Library Circulation Assistant, Clemons Library*, University of Virginia, Charlottesville, VA

August 2024 - Present

- Assisted patrons with checkouts, basic IT support, and re-shelving; worked flexible weekend and evening shifts.