

TITUS HYUNKYU LEE

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EDUCATION

University of Virginia, School of Engineering and Applied Science, Charlottesville, VA

August 2023 - May 2027

B.S. in Electrical Engineering and Computer Engineering; Minor in Business

- Cumulative GPA: 3.89/4.0 | A. James Clark Scholar.
- Activities: Tau Beta Pi Engineering Honor Society (Professional Development Chair), Theta Tau, Taekwondo Club.

EXPERIENCE

Software Engineering Intern, **General Atomics**, Herndon, VA

June 2026 - August 2026

- Developed and deployed a VS Code extension replacing manual raw-hex inspection of command/telemetry packets, supporting 4+ spacecraft and databases with byte-level parsing, packet editing, CRC validation, and database-driven field decoding.
- Integrated and validated command and telemetry paths across a VORAGO development board and OpenC3 COSMOS using serial and UDP, and integrated LoRa communication links using development boards, GNU Radio, and USRP.
- Automated previously manual embedded flight-software validation by developing a GitLab CI/CD pipeline for CMake builds, CTest unit testing, code-quality checks, JUnit reporting, and build-artifact management.

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

December 2025 - January 2026

- Developed embedded firmware on an ESP32 Feather to interface with a Bosch BME688 gas sensor and perform real-time smoking/vaping classification using a neural-network model trained in Bosch BME AI-Studio.
- Validated the feasibility of real-time smoking/vaping detection on embedded hardware by characterizing classification accuracy, detection range, and sensitivity to smoke/vapor intensity for integration into Intel's EOS2 smart thermostat.

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

August 2025 - May 2026

- Supported 140+ students across two semesters through weekly office hours, grading, and development of homework and exam problems covering Fourier analysis, convolution, and LTI systems.

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

June 2025 - August 2025

- Developed a self-powered intruder alert prototype by integrating a triboelectric nanogenerator sensor with a microcontroller for real-time motion detection, processing and validating sensor signals using MATLAB and LabVIEW.
- Designed and fabricated vertical contact-separation and single-electrode TENG prototypes, evaluating material and surface-treatment performance through contact-angle measurements.

PROJECTS

RISC-V CPU Design – Verilog / Quartus / ModelSim

Spring 2026

- Designed and implemented a five-stage pipelined RISC-V RV32I processor in Verilog with modular datapath and control logic supporting fetch, decode, execute, memory, and writeback pipeline stages.
- Implemented forwarding, load-use stalls, and branch flushing to resolve pipeline hazards; verified arithmetic, memory, jump, and branch instructions using ModelSim waveforms and RARS reference output comparisons.

Low-Power SRAM Design – Cadence Virtuoso / Spectre

Spring 2026

- Designed and verified a 1 Mb low-power SRAM in FreePDK45 using a hierarchical 16-bank architecture with 6T bitcells, row/column decoders, sense amplifiers, write drivers, pass-gate output muxing, and output latching.
- Reduced active and idle power through selective block enabling and MTCMOS decoder leakage reduction; validated read/write functionality, SNM, timing, and PVT robustness using Cadence Spectre simulations and Ocean scripting.

Embedded Music Player – C / MSPM0

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 – KiCad / MultiSim

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: C, C++, Python, Java, VHDL, Verilog, JavaScript, x86 Assembly.
- Tools & Software: Code Composer Studio, KiCad, Quartus, NI Multisim, Cadence Virtuoso, LabVIEW.
- Relevant Coursework: Signals & Systems, Embedded Systems, VLSI, Computer Architecture & Design, Computer Systems & Organization I & II, Digital Logic Design, Microelectronics, Applied Circuits, Electronics, AI Hardware (In Progress).
- Languages: English (Native), Korean (Native).