

Guy Tre'sor Irampaye

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EDUCATION

Northern Illinois University | DeKalb, IL

Degree: Bachelor of Science in Electrical Engineering | Graduated: May 2025

TECHNICAL SKILLS

- **Hardware Description & Programming:** Verilog, SystemVerilog, VHDL, C, C++, C#, Python, Assembly (Arm Cortex-M), TCL.
- **EDA & Simulation Tools:** Synopsys (Design Compiler, Saber), Cadence (Virtuoso, Spectre), SilvacoTCAD, SIMPLIS, Siemens(QuestaSim).
- **Modeling & Analysis:** MATLAB, Mathcad, LTspice, Ansys, Fusion 360, AutoCAD, COMSOL.
- **FPGA & Digital Systems:** Xilinx Zynq, Intel Cyclone, FPGA HLS (C++→RTL), DSP48E1 blocks, LVDS I/O.
- **PCB Design:** Altium Designer; ~16-layer board, impedance control (PCIe/DDR3).
- **Semiconductor & Thin-Film:** HSPICE, Monte Carlo analysis, Sonoplot Micro-plotter, NANYTE D10, ANRIC AT-410.
- **Power Management:** Subthreshold logic & SRAM stability (0.6V), near-Vt operation, Buck converters (12V→1.2V), GaN gate drivers (115V+).
- **Systems & Databases:** Windows, Linux, MacOS, RTOS, SQL, Time-Series.

EMPLOYEE/ PROJECTS

Senior Design (9.5/10) | Danfoss | 2024-2025

- Led team designing 16-layer impedance-controlled PCB (PCIe/DDR3, TI PMIC sequencing) and the automated test system for it.
- Programmed Allen Bradley PLCs to control a custom conveyor system, coordinating the movement of multiple PCBs through sequential hardware validation tests.
- Integrated the test PCB with the PLC controlled conveyor to create an end-to-end automated validation process which created efficient testing.

PI Thermal Control Loop (9.4/10) | NIU | 2024

- Built PI controller regulating transistor temperature $\pm 5^{\circ}\text{C}$.
- Tuned loop for dynamic load stability; tested with oscilloscope.

Analog Front End w/ MEMS (9.4/10) | NIU | 2024

- Designed Cadence-based LNA (180 nm); 1.2 micro-V/sqrt Hz noise, 60 dB SNR at 0.8V.

PLL Frequency Synthesizer (9.5/10) | NIU | 2024

- Implemented 74HC4046 PLL (1.5–5.8 MHz hold-in range).
- Added divider for $2\times$ – $9\times$ frequency multiplication.

BJT & Op- Amp Circuits (9.6/10) | NIU | 2024

- Designed BJT amplifier (gain -6 V/V , 50 Hz–20 kHz) and op-amp comparator/relay driver.
- Characterized diodes, BJTs, MOSFETs against datasheets.

RISC-V Core w/ ISA Extension (9.4/10) | NIU | 2024

- Implemented 5-stage RISC-V on Artix-7 FPGA with AES-256 unit.
- Simulated ASIC flow: 1.1 GHz target, 25% power reduction via multi-Vdd.

Thin-Film MOS & MIM Capacitors (9.3/10) | NIU | 2023-2024

- Fabricated high-k Al₂O₃ films (5–10 nm) via ALD; built/characterized MOS & MIM capacitors.
- Achieved t_{ox} 3–7 nm, negligible hysteresis, capacitance ≈ 5 fF/ μm^2 , leakage < 1 nA at 5V.

U.S. Army Reserves Supply SGT/ Armorer (6.7/10) | Madison, WI | 2018-2025

- Managed supply and logistics for 3,000+ soldiers across multiple operations.
- Oversaw equipment accountability, maintenance, and distribution at battalion level.
- Certified in logistics and cybersecurity through Army training.

VOLUNTEER EXPERIENCE

Braven Team-Lead (8.2/10) | NIU | 2025

- Completed 100+hours as a volunteer.
- Developed workforce skills such as lead researcher, networking in teams.

INTERESTS/ A BIT ABOUT ME

- Played College Soccer at RVC. | 2018
- Languages: English, Kirundi.