

Zeke Mohammed

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Engineering Physics student with hands-on experience in PCB design, embedded systems, FPGA development, and computational research. Completing accelerated 3-year degree while managing concurrent research and teaching roles.

EDUCATION

Fordham University Bronx, NY
B.S. Engineering Physics, Electrical Concentration; Minor in Mathematics; GPA: 3.31 Expected May 2026

- Completing degree in 3 years while working 15–20 hrs/week in research and teaching roles
- Sarah Colman Klemmer Research Fellow, Sigma Xi Honor Society, CSTEP Scholar
- Coursework: E&M I/II, Quantum Mechanics, Circuits, Thermo & Statistical Mechanics, Linear Algebra, Multivariable Calculus, Experimental Techniques

TECHNICAL SKILLS

PCB & Embedded: KiCad (schematic, layout, Gerber, BOM), STM32, ESP32, Raspberry Pi, Arduino, C/C++, bare-metal programming

FPGA: Xilinx Artix-7, Verilog, Vivado, pipelined architectures, fixed-point arithmetic

Software: Python, MATLAB, Java, Git/GitHub, Linux, Flask, NumPy, pandas, matplotlib, LaTeX, SQL

Protocols: CAN bus (ISO 11898), I2C, SPI, UART, PWM, OBD-II (ISO 15765-4)

Hardware & Test: Oscilloscope, multimeter, signal analysis, SMD/through-hole soldering, PCB assembly & rework

CAD: Fusion 360, SolidWorks, KiCad 3D viewer, Blender, 3D printing (FDM/ABS)

TECHNICAL PROJECTS

Yamaha ATV CAN Bus Sensor Node | KiCad, STM32, CAN Bus, Fusion 360 March 2026

- Designed production-ready 2-layer PCB (60×40 mm, ENIG) with STM32F103 and SN65HVD230 CAN transceiver; aggregates throttle position, coolant temp, wheel speed, and battery voltage into a single CAN 2.0B frame at 500 kbaud / 10 Hz
- Full deliverable package: schematic, layout with solid ground plane and matched-length CAN differential pairs, Gerbers, interactive BOM (21 line items, \$15.10 prototype cost), and design rationale document
- Designed injection-moldable ABS enclosure in Fusion 360: IP67-ready O-ring gasket groove, M6 ATV frame flanges, DB9 strain relief, countersunk lid screws, debossed Yamaha branding; <\$1/unit at production volume

FPGA Real-Time Image Processing Accelerator | Verilog, Vivado, Python June 2025 – Present

- 7-stage pipelined convolution engine on Xilinx Artix-7 with systolic array and Q8.8 fixed-point arithmetic; 48–53× speedup over NumPy at 0.85 W. Three clock domains with CDC synchronizers; BRAM line buffer; Python-UART verification and VGA output

Flight Controller + Power Distribution | STM32, C, PID Control November 2024 – May 2025

- Bare-metal STM32F405 firmware: 1 kHz cascaded PID loop with complementary filter sensor fusion (MPU6050 I2C/SPI); <2° RMS error, 655 μs loop time. Power system: 11.1 V 3S LiPo, four 20A BLHeli_S ESCs, overcurrent protection

Vehicle Telemetry System | ESP32, GPS, OBD-II, Bluetooth October 2024

- Multi-protocol ESP32 system: GPS via UART (NEO-6M/TinyGPS++) and live ECU data over Bluetooth OBD-II (ISO 15765-4 CAN, 500 kbaud). Cross-validates dual speed sources on SSD1306 OLED with five cycling display screens

Multi-Sensor DAQ System (M3) | Python, Raspberry Pi, Flask October 2023 – April 2024

- 12+ sensors across CAN/I2C/UART at 50 Hz; automated logging with Flask telemetry dashboard; <2% error over 50+ hrs

PROFESSIONAL EXPERIENCE

Electrical Engineering Intern June 2024 – August 2024

Hyzon Motors Rochester, NY

- Characterized 200 kW hydrogen fuel cell stack via V-I polarization curve tests; Python post-processing to isolate ohmic, activation, and mass transport losses. HV validation (400–800 V DC): hipot, insulation resistance, continuity. BMS telemetry over CAN bus during fuel cell–battery hybrid integration testing

Undergraduate Researcher, Lattice QCD August 2024 – Present

Fordham University Physics Department Bronx, NY

- Built Python framework for SU(2) lattice gauge theory (8³×20 lattice): 81,920×81,920 sparse Wilson–Dirac operator, BiCGSTAB/GMRES solvers, 200+ Monte Carlo configs. Generalized SU(2)→SU(N) with 3× runtime improvement
- Contributing editor for *High Energy Physics Essentials* (Wiley) by Dr. C. Aubin; presented at CSTEP Symposium

Teaching Assistant, Lab Instructor & Lab Manager August 2023 – Present

Fordham University Bronx, NY

- TA: 30+ students, 120+ lab reports/month. Lab Manager: 50-workstation teaching lab, 99%+ uptime, 40% faster deployment

Freelance Electronics Technician January 2020 – Present

Self-Employed Queens, NY

- 50+ clients: console modifications, firmware flashing, custom PC builds, component-level SMD repair; 5.0/5.0 rating

LEADERSHIP & ACTIVITIES

Fordham Rocket Propulsion Lab, Co-Founder (Sept 2024 – Present): Propulsion design, thrust calcs, trajectory modeling, Fusion 360 | **Physics**

& Math Tutor, Knack (June 2024 – Present): 5.0/5.0 across 50+ sessions | **Fordham Physics Society** (Sept 2023 – Present)