Nachiket Kerai

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Highly motivated B.S. in Computer Engineering and Computer Science with expertise Digital Design, Computer Architecture and parallel computing.

Education

University of Wisconsin-Madison Madison, WI

B.S. Computer Engineering and Computer Science *December 2025*

- Courses: Intro to Algorithms, Database Management Systems, Operating Systems, Microprocessor Systems, Circuit Analysis, Intro to AI, Digital System Design and Synthesis, Computer Architecture, GPU Algorithm and System Design
- Awards: Dean's Honor List Fall 2022, Spring 2023, Fall 2023, Spring 2024, Fall 2024, Spring 2025, Fall 2025

Experience

Embedded Hardware Engineer Januaray 2026 – Present

Milwaukee Tool *Milwaukee, WI*

- Program and debug medium and high torque motor control boards using embedded C, troubleshooting PWM control strategies for three-phase brushless motors
- Design comprehensive three-phase motor control test plans to ensure technology safety and reliability

Data Structures Peer Mentor August 2025 – December 2025

CDIS @ UW-Madison *Madison, WI*

- Mentored 600+ students on complex data structure concepts (Lists, Stacks, Queues, Trees) and algorithmic complexity
- Collaborated with course staff to adapt course content based on student needs and maintain course relevance

Undergraduate Researcher January 2025 – December 2025

Visual Computing Lab @ UW-Madison *Madison, WI*

- Developed Python programs to process time-of-flight sensor data into computer vision datasets, streamlining dataset generation for ML training
- Integrated VL53L0X time-of-flight sensors to enhance inexpensive robot perception

Software Engineering Intern June 2025 – August 2025

Cribl *San Francisco, CA*

- Designed a distributed Time-to-Live (TTL) logging feature using TypeScript and Node.js, directly addressing critical customer needs while optimizing log storage costs for the company
- Completed various bug tickets using TypeScript, Node.js, TLS, ensuring system stability and overall product reliability

Embedded Systems Research Intern May 2024 – May 2025

Bick Digital Entomology Lab @ UW-Madison *Madison, WI*

- Designed a low-cost agricultural monitoring device using a ESP-32 microcontroller with a VL53L0X time-of-flight sensor interfaced via I2C
- Developed ESP-32 firmware (C++) for data collection and Python programs for insect biomarker analysis

Projects

GPU-Accelerated NLOS Image Reconstruction | *Python, CuPy (CUDA), SLURM, NumPy*

- Accelerated a Non-Line-of-Sight (NLOS) image reconstruction algorithm by porting computationally intensive operations (FFTs, convolutions) from NumPy to CuPy
- Leveraged CUDA based GPU parallelization by writing SLURM scripts to manage and execute batch jobs on a high-performance computing (HPC) cluster

EBike Controller | *Verilog, SystemVerilog, Digital Design, FPGA*

- Designed and implemented a complete digital controller for a brushless DC motor eBike system using SystemVerilog
- Developed a comprehensive testbench verifying SPI interfaces, cadence simulation, torque seeding, and low-battery thresholds

RISC-V Pipelined Processor | *Verilog, Computer Architecture*

- Designed a 5-stage pipelined 32-bit RISC-V processor with hazard detection, data forwarding, and branch prediction
- Implemented instruction decoder for 6 formats (R/I/S/B/U/J-type) supporting 37 RV32I instructions
- Developed pipeline control logic with stall/flush mechanisms for control hazards

Technical Skills

Languages: C/C++, Python, SystemVerilog/Verilog, TypeScript
Skills: freeRTOS, Node.js, ROS2, UNIX, I2C/SPI/UART
Developer Tools: Git, Bash, Quartus Prime, ModelSim, Altium, IAR, Oscilloscope, Picoscope