Furdeen Hasan

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Education

University of Delaware Newark, DE

B.S. Computer Engineering; Minor: *Computer Science; GPA: 3.409/4.0* *Expected May 2025*

- **Dean's List**: Spring 2021, Fall 2022
- **Relevant Coursework**: Data Structures, Operating Systems, Computer Networks, VLSI Design, Microprocessor Systems, Signals and Systems, Digital Signal Processing, Statistics Probability, ECE Design & Entrepreneurship

Experience

University of Delaware Newark, DE

Researcher - Trustworthy Artificial Intelligence Development - Dr. Xi Peng *Feb. 2024 - Present*

- Utilized Explainable AI (XAI) to develop sediment segmentation models for bathymetry and backscatter data.
- Applied rasterization and patch creation to data processing for improved domain generalization across geologic areas.

Office of Academic Enrichment - Tutor *May. 2023 - Present*

- Offered academic support in math, science, engineering, and writing courses to undergraduate students.

Residence Life & Housing - Resident Assistant *Aug. 2022 - Present*

- Oversaw an apartment-style college residence hall of 60 residents, providing 24/7 support and conflict resolution.
- Senior Resident Assistant: Promotional Role focused on staff training, social media promotion, and engagement.

New Student Orientation Leader *Nov. 2021 - Jul. 2022*

- Managed groups of 20+ students facilitating engagement and presenting on University Policies and Resources.

Department of Mathematical Sciences - Calculus Coach *Sep. 2021 - Dec. 2022*

- Led group tutoring for Calculus, engaging up to 30 students in interactive learning and worksheet discussions.

Undergraduate Research Intern (DEVCOM) Newark, DE

Compact and Fast-scanning passive mmWAVE imager *June. 2024 - Aug. 2024*

- Developed a compact passive mmWave imager, detecting ambient W-band radiation for security and diagnostics.
- Utilized a Farran Radiometer with three-axis linear stage, controlled via a Raspberry Pi and Python programming, for scanning, data acquisition, and temperature-contrast heatmap generation (NumPy and Seaborn).
- Designed 3D-printed components and optimized the imaging with a Rexolite lens for accurate thermal detection.
- Future work: optimize mobility with tripod and casing, refine data processing algorithms, improve signal-to-noise ratio with chopping; continued for Capstone Senior Design.

Projects

FireGuard - Innovative Fire Safety and Detection Python, HTML, Raspberry Pi

- Developed a cost-effective fire detector utilizing a Raspberry Pi with thermal cameras programmed using Python.
- Programmed an HTML-based GUI for system control and real-time temperature readings, triggering a phone-text-based fire alert system. Final product is housed in a compact flame-resistant casing.

Bluetooth Low Energy (BLE) Security Enhancement nRF52840-DONGLE, Mirage

- Led a team to strengthen BLE device security by simulating attacks and developing a non-cryptographic method using an nRF52840 semiconductor, to differentiate devices based on power spectral density analysis.

Advanced IoT Accelerometer and Temperature Sensor KiCAD, Arduino Uno, Adafruit IO

- Designed and programmed a Printed Circuit Board with Arduino, integrating a LIS3DHTR 3-axis accelerometer, temperature sensor, and OLED display with real-time data visualization via Adafruit IO.

4-Bit VLSI Arithmetic Logic Unit Design and Implementation Cadence Design Systems

- Constructed a 4-bit Arithmetic Logic Unit using Cadence Design Systems, ensuring it passed all industry checks.

Advanced Path-Tracking Autonomous Robot PIC32 Microcontroller, MPLAB X IDE

- Built an autonomous robot using a Diligent Basys MX3 PIC32MX Board, servo motors, and IR sensors. Programmed for precise navigation and control, featuring a sound-activated start and integrated time display.

Skills

Languages: C++, C, Python, Javascript, Typescript, Java, MATLAB, Mathematica, Bash, VHDL, HTML

Technologies: Git, Autodesk Fusion, Google Cloud, Cadence, Wireshark, LTSpice, Arduino, Docker