

Varun Pal

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EDUCATION

University of Illinois Urbana-Champaign

Urbana-Champaign, IL

Bachelor of Science in Computer Engineering, Minor in Mathematics

Expected Graduation: Spring 2026

– Technical GPA: **3.93**

– Relevant Coursework:

Data Structures & Algorithms

Computer Systems Engineering

Applied Parallel Programming

Deep Learning For CV

Robotics

Digital System Design

WORK EXPERIENCE

Gupta AI Lab

Summer 2024 – Present

Summer Researcher

University of Illinois Urbana-Champaign, IL

- Contributed to research focused on improving robotics and computer vision **diffusion policy** under the guidance of **Prof Saurabh Gupta**
- Trained neural net policy utilizing self and cross **attention** on DROID data set in a **transformer architecture** to improve task generalization
- Implemented a **data-distributed parallel** system, **improving GPU utilization** from 30% to 90%
- Gained hands-on experience in **filtering and processing large video datasets**, for training ML models

Abbott

Summer – Fall 2023

Software Engineering Intern

Santa Clara, CA

- Developed and implemented **automated testing scripts** in **Visual Basic** for Abbott Diabetes Care products, reducing manual testing time by **40%** and improving overall test coverage
- Designed an efficient **data parsing algorithm** using **chunking techniques** to process **large datasets** (> 1MB) from glucose monitoring devices, enabling faster analysis of product performance metrics
- Created a **data visualization dashboard** using **Power BI**, providing real-time insights into product testing results and facilitating data-driven decision-making in the development process

PROJECT EXPERIENCE

OStrich | *Operating System, RISC-V*

Fall 2024

- Designed and implemented a Unix-based custom operating system with features including **paging virtual memory management**, **multi-thread processes**, and an **expandable file system** on RISC-V architecture.
- Developed **UART device drivers**, **VGA screen driver**, and **VirtIO block device driver**
- Capabilities: execution of **POSIX like shell**, file reading/writing, and **snake game** in the Qemu virt env

FPGA: Plants vs Zombies Video Game | *System Verilog, C, FPGA*

Spring 2024

- Recreated PvZ on Spartan 7 FPGA using **System Verilog** and C debugging with **DebugCore** and **Simulation**
- Utilized **System on Chip** design using MicroBlaze CPU to interface with peripherals like mouse/keyboard
- Implemented collision logic, game state machine, color mapping logic, object spawning

Soft Robotics Research | *Arduino, Robotics*

Spring 2024

- Built a physical prototype of a wearable robot that uses compact **Arduino**, motors, cables, and a silicone glove that bends a person's fingers based on theoretical **research paper: Piano Press**
- Published Research Paper in the **Journal of Student Research** with a team of 2
- Presented at Research Capstone Seminar to 150+ academics

LEADERSHIP EXPERIENCE

RoboSub

2022 – 2024 Spring

Lead

University of Illinois Urbana-Champaign, IL

- Implemented depth perception and obstacle tracking for underwater environments using the Zed X camera and API
- Managed image processing pipeline for our computer vision including object detection using **YOLO V5**

TECHNICAL SKILLS

Programming: C++, Python, PyTorch, C, CUDA, ROS2, Java, System Verilog (Xilinx Vivado), Visual Basic

Tools: FPGA, Git, AXI, I2C, SPI, UART, Vivado, Vitis, Linux, Fusion 360