ay 140@duke.edu 909 729 6282

# Shaan (Aasmaan) Yadav

website: shaan 106. github.io

Education

**Duke University** 

Expected May 2026

Durham, NC, USA

BSE: Double major in Electrical and Computer Engineering & Computer Science

4.0 GPA | Dean's List with Distinction | Duke Energy and Climate Club

**Eton College** 

September 2017 – June 2022

4.0 GPA (all A\* grades) | Oppidan (Academic) Scholar | House Captain | President of Scientific Society

Windsor, Berkshire, UK

Relevant Courses & Skills

Courses – ECE 350 Digital Systems [A+], ECE 250 Comp. Arch. [A+], ECE 280 Signals & Systems [A], ECE 552 Advanced Comp. Arch. I [Fall '24], Princeton's ELE 475 Comp. Arch. [audit]

Languages - Python, Java, C/C++, Verilog, HTML/CSS, Matlab, Swift, Lua, Assembly

Technologies - Gem5, CUDA in C, Linux, FPGAs, Arduino, PyTorch, Git, HPCs, React

Experience

## Yale Computer Systems Lab

May 2024 - Present

Computer Architecture Research Intern

New Haven, CT, USA

• Research under Prof. Bhattacharjee on Brain Computer Interface chip design (the HALO chip)

## **Duke Electrical & Computer Engineering**

December 2023 - Present

Teaching Assistant

Duke University, NC, USA

- Fall '24: TA for CS/ECE 350 (Digital Systems, Chip Design) under Prof. Bletsch, Prof. Board
- Spring '24: TA for CS/ECE 250 (Computer Architecture) under Prof. Sorin and ECE 110 (Fundamentals of Elec. Engineering) under Prof. Daily
- Hold 6 hours of office hours for  $\sim$ 300 students every week, help create and grade quizzes & exams, assist with lectures

## **Duke Singh Research Lab**

September 2023 - January 2024

Student Researcher

Duke University, NC, USA

- Research under Prof Rohit Singh at the Singhlab at Duke (https://singhlab.net)
- Developed easy-to-use pipeline for protein-drug interaction prediction models; developed algorithms to generate gene sequences from .mol2 data (LIT-PCBA); trained the Conplex model using contrastive training for better 1-shot prediction

#### Raiz Vertical Farms

June 2023 – August 2023

Engineering Intern

Lisbon, Portugal

- Built computational models using self-collected data to show optimal combination of liquid flow rate, temperature and luminosity for maximising yield. Led to an annual yield increase of about 0.2 kg per square meter
- Transferred front-end app from obsolete technologies to Mantine v7; Connected environments to postgres SQL database; Refactored old React code into new environments

Relevant Projects

more projects: shaan 106.github.io

#### **FPGA Boids**

https://shaan106.github.io/projects.html#boids\_fpga

A highly efficient FPGA hardware level implementation of the boids algorithm. Custom Verilog hardware units, custom 5-stage
pipelined CPU, custom compiler and display management system.

## 5-stage pipelined bypassed CPU

https://shaan106.github.io/projects.html#verilog\_mips\_cpu

 MIPS inspired ISA processor built from scratch using structural verilog. 32-bit 100MHz processor, Pipelined and Bypassed, Hazard handling, Wallace Tree multiplier, Restoring Division Divider, CLA adder

Other Experiences

Palantir (Data Science Intern, '22), Jaipur Foot (Field Volunteer, '21), TeensInAI (ML Theory Teacher, '20-'21), BBC (Intern, '19), Rock Climbing (since '22), Fencing (since '18)

#### 32-bit five-stage pipelined CPU

Hardware Engineer

January 2024 – Present

Duke University, NC, USA

- Fully designed, simulated and implemented (using Verilog and FPGAs) a five-stage fully pipelined 32 bit CPU
- Processor includes fully functioning ALU, multiplier (Wallace Tree), Division, interrupts, bypassing and hazards
- Currently in process of writing assembly code that can be executed by processor for a project built around CPU

#### Council for Entrepreneurial Development

October 2023 - Present

Intern

Durham Research Triangle, NC, USA

- Accelerating development of early-stage startups as part of the CED Startup Talent and Training program
- Helped manage a startup pitching event for 200 people; Analysed startup data (salesforce) to better inform resource allocation; Creating a large-language model built upon GPT-4 to provide CED-specific information to clients 24/7

## Solar Panel Efficiency Optimization Through Image Capture

August 2022 – December 2022

Hardware Engineer

Duke University, NC, USA

- Worked for for Dr. Mike Bergin (Duke University Professor) under Professor Rebecca Simmons' mentorship to deliver a low-cost, simple Arduino device to sense dust on solar panels
- Captured images of dust levels for analysis to optimize solar panel cleaning schedules and maximize solar efficiency
- Contributed to and delegated tasks regarding technical memos, presentations, and an academic poster as a team

**Palantir** 

June 2022 – July 2022

Data Analyst Intern

London, UK

• Analysed and extrapolated raw, incomplete UK wildfire data (using Palantir's Foundry platform) to provide data-backed insights for the UK fire department to most effectively distribute resources to combat unexpected wildfires

## Hackathons for Sustainable Development

2018 - 2022

Developer

London, UK

- Involved in multiple hackathons developing several apps following the UN Goals for sustainable development
- Developed MelanomaScan, an iOS app to diagnose skin cancer using iphone cameras, and provide location and person specific cancer risk, project demo: https://shaan106.github.io/projects/project\_melanoma\_scan.html
- Developed NewsPal, a google chrome extension to help highlight disinformation online, won the Hoberman Prize, hired by Laura Ellis to develop disinformation detection algorithms with the BBC Blue Room
- Invited to mentor teams for NASA Space Apps challenge in London, helped develop technical MVPs and taught pitching skills

TeensInAI

March 2020 - January 2022

Course Developer and Teacher

London, UK

- Hired by TeensInAI to develop and teach a course as an introduction to machine learning for teens
- Taught course to ~200 students; 60 students at a TeensInAI hackathon, 30 at Eton, and 100 more through recorded content
- Link to content: https://youtube.com/playlist?list=PLhH6nWDpggsH5EI8oKAXosorKVcH59tbE