Aman Kumar

Bachelor of Technology
in Electrical Engineering
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Education

Degree	Institute/Board	CGPA/Percentage	Year
Bachelor of Technology	Indian Institute of Technology, Ropar	8.20 (Till 6th Sem)	2018-2022
Senior Secondary	Central Board of Secondary Education	95.4%	2018
Secondary	Central Board of Secondary Education	10.0	2016

Experience

- **IIT Delhi** *June 2021 - Nov 2021*
  Research Intern New Delhi
  - This is a research intern under Dr. Smruti Sarangi, Associate Professor, IIT Delhi. Working on optimization of **PUMA compiler's workload distribution**. PUMA: Programmable Ultra-Efficient Memristor Based Accelerator for Machine Learning Inference, is memristor-crossbar based **Analog In-memory computing device** that uses crossbars and general execution units to achieve high acceleration on a variety of ML workloads.
  - Traces are being analysed for understanding the dependencies of workload. The independent instructions are relocated on different tiles and cores for speeding up the PUMA Compiler and creating equitable workload distribution across the tiles.
- **IIT Delhi** *June 2020 - October 2020*
  Research Intern New Delhi
  - This is a research intern under Dr. Smruti Sarangi, Associate Professor, IIT Delhi. We built a tool for doing an **architectural simulation of an Operation System**. This is a very important tool for doing research in the area of computer architecture and OSes. We split this tool into two parts.
  - The first step was to emulate the OS and collect Instruction traces. The second step was to simulate the traces for a given architecture. I worked on collection of traces of **OpenBSD 6.5 using Qemu** emulator by running **UnixBench Benchmarks**. Validation was done by QemuTrace software developed by IIT Delhi. I **received an LOR** for this internship.

Projects

- **Neuromorphic Hardware System for Visual Pattern Recognition** *Jan 2021 - May 2021*
  Dr. Devarshi Mrinal Das **Github**
  - Worked on a paper titled "Neuromorphic Hardware System for Visual Pattern Recognition with Memristor Array and CMOS neuron". It works towards **identifying images of digits 0-9 using Memristor array and CMOS neurons**.
  - Simulation of the spike generation is done using Python and LTSpice, where the program essentially processes the input image using an algorithm and sends data points to a Piece-wise-linear(PWL) voltage source.

Technical Skills

- **Programming Languages**: C/C++, Python, Java, Verilog, MATLAB, SQL(Basics)
- **Frameworks and Libraries**: OpenCV, Pandas, Numpy, Matplotlib, NASM Assembler(Basics)
- **Software/OS** : Windows,OpenBSD, Ubuntu, Icarus, GTKWave, GitHub, LTSpice, QEMU

Key courses taken

- **CSE & Maths**: Algorithms and Data Structures, Linear Algebra and Fourier Transformations
- **Electrical and Electronics**: Analog Electronics, Digital IC Design, Control Engineering Circuits, Circuit Theory, Power Electronics, Communication Engineering

Miscellaneous

- **Enigma Club Member**,Participated in various Intra - College and Inter - College quizzing events *2018-22*
- **NCC Cadet**, Served As NCC Cadet and attended ATC-127 in Rupanagar, Punjab *2019*
- **NTSE Scholar**, The NTSE is a national level scholarship program in India started in the year 1963. *2016*