# PRANATI MAJHI

PhD Student

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## SUMMARY

I am currently a fourth year PhD student at Texas A&M University, working in the field of Computer Architecture. My research interest lies in the area of Hardware Accelerators, specifically focusing on strategies for improving communication overhead in Distributed Deep Learning Applications.

## SKILLS

**Languages:** C, C++, Python, Bash, Verilog, MIPS, RISCV
**Web Dev:** HTML/CSS, PHP, Javascript
**Tools:** Git, LaTeX, Slurm, MATLAB
**Simulators:** ScaleSim, BookSim, ChampSim

## PUBLICATIONS

IEEE HPCA 2024 **Enhancing Collective Communication in MCM Accelerators for Deep Learning Training**
**Sabuj Laskar, Pranati Majhi, Sungkeun Kim, Farabi Mahmud, Abdullah Muzahid, Eun Jung Kim**
co-authored the paper that was presented in International Symposium on High-Performance Computer Architecture 2024 (18% Acceptance Rate)

IEEE MICRO 2025 **SuperMesh: Energy-Efficient Collective Communications for Accelerators**
**Sabuj Laskar, Pranati Majhi, Abdullah Muzahid, Eun Jung Kim**
co-authored the paper to be presented in IEEE/ACM International Symposium on Microarchitecture 2025 (20% Acceptance Rate)

## PROJECTS

Texas A&M University **ECEN676 Course Project**
simulated the idea in HPCA'22 paper "Effective Mimicry of Belady's MIN Policy" using ChampSim.

Texas A&M University **CSCE611 Course Project**
worked on various system changes on xv6 to understand system calls, paging, copy on writes, threading, virtualization.

Texas A&M University **CSCE735 Course Project**
implemented and ran parallelized search algorithms using OpenMP and MPI on Texas A&M University's cluster (HPRC).

Texas A&M University **CSCE614 Course Project**
simulated the idea in ISCA'22 paper "Themis: a network bandwidth-aware collective scheduling policy for distributed training of DL models" using ScaleSim and BookSim.

Indian Institute of Technology Kanpur **CS335 Course Project**
built a compiler from scratch using lex, yacc and generated MIPS code which was simulated using SPIM.

## EDUCATION

2022 - Present **Texas A&M University, USA** — **Graduate School**
Doctorate in Computer Engineering
CGPI : 4.0/4.0

2018 - 2022 **Indian Institute of Technology Kanpur, India** — **Undergraduate School**
Undergraduate in Computer Science and Engineering
CPI : 8.6/10.0
Graduated with Distinction

2018 **Shivjyoti Senior Secondary School, India** — **Central Board of Secondary Education, New Delhi**
Grade XII
Percentage : 96.4/100.0

## EXPERIENCE

08/2022 - Present **Texas A&M University** — **Research Assistant**
joined the research group working on hardware accelerator design under the guidance of Prof. Eun Jung Kim and working on projects to find efficient communication strategies for distributed DNN accelerators

08/2024 - 12/2024 **Reality Labs, Meta Platforms, Inc.** **Research Scientist Intern**
was a part of the Silicon Research Team and explored the usage of Large Language Models for Silicon design, especially Verilog RTL Code generation and benchmarking

07/2023 **Barcelona Supercomputing Center** **Summer School**
successfully completed the 4th ACM Europe Summer School on HPC Computer Architectures for AI and Dedicated Applications.

Spring 2023
Spring 2024
Spring 2025 **Texas A&M University** **Teaching Assistant**
conducted weekly laboratory sessions for the undergraduate course of Computer Organization (CSCE312).

06/2021 - 07/2021 **Goldman Sachs** **Summer Internship**
worked in the CWM Division towards my Internship project to use Java Flight Recorder and Java Mission Control to detect memory leaks in Java programs.

## ACHIEVEMENTS

2019 **Indian Institute of Technology Kanpur, India**
Awarded the Class of 1990 Scholarship & Academic Excellence Award - Dr. Sangeeta Goel Memorial Award

2018 **Joint Entrance Examination - JEE(Advanced)**
secured an All India Rank 427 in JEE(Advanced), among 155,000 candidates

2017 **Department of Science and Technology of the Government of India**
Kishore Vaigyanik Protsahan Yojana (KVPY) Scholarship Awardee with an All India Rank of 135

2016 **National Council of Educational Research and Training (NCERT), New Delhi**
National Talent Search Scholarship Awardee among the 1000 All India awardee of 10th grade

2016 **CBSE, New Delhi and KVS, New Delhi**
Certificate of Merit and Award for A1 grade in all subjects of 10th grade

## COURSES

- Parallel Computing
- Computer Architecture
- Arithmetic Logic Design
- Introduction to Machine Learning
- Operating Systems
- Distributed Algorithms and Systems
- Hardware Security for IoT
- Algorithms
- Computer Organization
- Modern Cryptology
- Embedded Systems
- Basic Electronics
- Software Development
- Theory of Computation

## EXTRACURRICULAR ACTIVITIES

- Treasurer of the CSE Graduate Student Association at Texas A&M University
- Participated in the Group Dance in Galaxy'19 (Inter-hostel cultural competition) at IIT Kanpur
- Participated in the Electronics Club event in Takneek'18 (Inter-hostel technical competition) at IIT Kanpur
- Part of the NSS (National Service Scheme) Group of IIT Kanpur, which actively organized events for villages around the campus.