

Bhumika Mittal

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EDUCATION

Ashoka University

Bachelor of Science (Honours), Computer Science; CGPA: **3.90**/4.00
Minor in Mathematics, Entrepreneurial Leadership and Strategy

Sonipat, India

2021 – 2024

Maheshwari Girls Public School

High School Diploma; AISSCE (Science Stream): 95.4%

Jaipur, India

2018 – 2020

RESEARCH EXPERIENCE

Max Planck Institute for Software Systems

Visiting Research Fellow

Saarbrücken, Germany

May 2024 – Present

- Analyzing graph data access patterns during the execution of algorithms

Centre for Artificial Intelligence and Robotics, DRDO

Research Intern

Sonipat, India

Nov 2023 – Present

- Designed and implemented an indigenous lattice-based public key encryption and signature scheme
- Studied and presented a comprehensive report on NIST PQC finalists

IIT Gandhinagar

Research Assistant

Remote

May 2023 – Sept 2023

- Designed a dedicated hardware accelerator tailored for encoder-based models
- Simulated various architectures using simulators like Timeloop
- Area of work - Computer Architecture, Systems for ML, Deep Neural Networks

Lehigh University

Research Assistant

Bethlehem, US

May 2022 – Jun 2022

- Consulted Global Good Funds, a venture capital firm
- Established clear and identifiable metrics to evaluate ESG impact
- Measured the non-monetary impact for ESG goals of the ventures
- Strategized the optimal investment approaches for the Global Good Fund

Program in Mathematics for Young Scientists

Mehta Fellow

Remote

Summer 2020, 21

- Research project on de Bruijn Sequences proposed by Prof Matt Baker
- Completed Number Theory and Advanced Graph Theory course involving daily lectures and problem sets
- Exploratory Project on Fibonacci sequences

ACADEMIC WORK

Edge-Aware Language Model Acceleration

in review

Tom Glint, **Bhumika Mittal**, Santripa Sharma, Abdul Ronak, Aravind Krishna, Joyce Meki

- Proposed a Near Data Processing paradigm-based accelerator design which achieves a 1.2x speedup, a 58% reduction in area, and a 9x reduction in power compared to the state-of-the-art edge DNN accelerator and seamlessly integrates on edge devices

On the Existence of Balanced Generalized de Bruijn Sequences

Discrete Mathematics Journal

Bhumika Mittal, Haran Mouli, Eric Tang, and Matthew Baker

April 2023

- A balanced generalized de Bruijn sequence with parameters (n, l, k) is a cyclic sequence of n bits such that (a) the number of 0's equals the number of 1's, and (b) each substring of length l occurs at most k times. Determine necessary and sufficient conditions on n, l , and k for the existence of such a sequence.

PROJECTS

Anonymous Credentials | [GitHub](#)

- Explored privacy protecting authentication along with theoretical understanding and proof of security
- Implemented a zero-knowledge proof of knowledge based on Schnorr sigma protocol

Number Theoretic Transform | [GitHub](#)

- Wrote a detailed expository report on Number theoretic transform
- Implemented recursive/iterative cooley tukey, gentleman sande algorithms for cyclic and negacyclic convolutions

UNIV - An Ethereum Based Game | [GitHub](#)

- Developed and deployed AshokaToken (ASH), an ERC20 token, and a user-friendly frontend application
- Integrated MetaMask wallet connectivity enabling users to participate in a quiz game and exchange the tokens won through Automated Market Makers like Uniswap

BPHR - Blockchain-Powered Health Rewards | [GitHub](#)

- Implemented a reward system application on Hyperledger Fabric
- Implemented features include reward listing, outlet registration, user purchase registration with specified dates, outlet validation of purchases, and reward redemption

TEACHING EXPERIENCE

Ashoka University

Sonipat, India

5 × Teaching Assistant

- Undergraduate Teaching Assistant for the following courses:
 - * Technology Law and Policy (Spring 2024)
 - * Data Structures (Monsoon 2024)
 - * Discrete Mathematics (Spring 2023)
 - * Strategy through Board Games (Spring 2023)
 - * Introduction to Computer Programming (Monsoon 2023)
- Student Feedback: 4.88/5

Plaksha University

Mohali, India

Teaching Staff

April 2023 - June 2023

- Curated and taught a course on Microcontrollers to 200+ high school students
- Designed Game Dev Module - built 5 mathematical and hardware games
- Helped students build various IoT Projects using ESP32 chipset and other electronic components

Lodha Genius Program

Sonipat, India

Teaching Assistant

May 2023 - June 2023

- Worked closely with Siddharth Kankaria (from NCBS) to prepare and deliver a course on Science Communication
- Assisted 50+ students with their science communication projects and Olympiad-level math problem sets
- Organised and managed the programme logistics

WORK EXPERIENCE

Atlas Fellowship

Remote

Talent Coordinator

Aug 2022 – Oct 2022

- Strategised the Outreach for the Atlas Fellowship launch in India.
- Ran a campaign and managed a team of 12 to reach out 2500 top schools and 3000 coaching centres in India.
- Achieved the 148% increase in applications for the program.

Young Scholars Programme (YSP)

Sonipat, India

Office Counselor

May 2022

- Developed an infrastructure for the program by integrating different platforms
- Automated various processes for the program including workshop allocation, letter sharing, etc.

Brand warikoo

Remote

Tech and Product Intern

Feb 2021 – April 2022

- Ideated and built the *WebVeda* platform for the courses, which hosts 300k learners and helped in generating revenue of \$1Mn within 10 months.
- Managed different tech aspects of the brand, including payment gateway, email integration, etc.

HONORS AND AWARDS

2024	Summa Cum Laude , Ashoka University
2024	Silver Medalist , Department of Computer Science, Ashoka University
2024	Builder's Award , Department of Computer Science, Ashoka University
2021-24	Dean's List (every semester), Dean of Academic Affairs, Ashoka University
2022	Undergraduate Research Excellence Award , Department of Mathematics, Ashoka University
2019	Most Powerful and Serene (Best Student) Award , Maheshwari Girls Public School
2019	Winner , National Ideationology Challenge
2018	Best in IT , Maheshwari Girls Public School
2018	School Topper , National Cyber Olympiad

OTHER ACTIVITIES

Undergrad Architecture Mentoring Workshop (uArch) <i>Full Grant Recipient</i> <ul style="list-style-type: none">Received a full grant to attend 6th uArch 2024 and ISCA conference	ISCA 2024 <i>June 2024</i>
Workshop on Lattice-based Post-quantum Cryptography <i>Speaker, Organiser</i> <ul style="list-style-type: none">Organised a 2-day Workshop with various speakers and talks on PQCGave a talk on Number Theoretic Transform: Implementation Issues	Ashoka University <i>April 2024</i>
Academic Affairs Board <i>CS Student Representative</i> <ul style="list-style-type: none">Worked with the Department of Computer Science, and the Academic Advisory Board to strengthen the quality of the undergraduate major and the department	Ashoka University <i>May 2023 – May 2024</i>
IEEE Ashoka Student Branch <i>Co-director of IT</i> <ul style="list-style-type: none">Lead tech projects and conducted Computational Sciences workshop to promote the STEM cultureOrganised an intercollegiate STEM fest - Chimera	Ashoka University <i>Aug 2023 – May 2024</i>
Undergraduate Science Research Fest <i>Student Organiser</i> <ul style="list-style-type: none">Organised the poster presentation session, sci-art, and guest invites for a science fest	Ashoka University <i>Jan 2024 – Feb 2024</i>
ACM SPLASH 2023 <i>Student Volunteer</i> <ul style="list-style-type: none">Working with the organizers as a student volunteer to organise SPLASH conference	Virtual <i>Sept 2023 – Oct 2023</i>
Computer Science Society <i>Student Advisor, Interim President</i> <ul style="list-style-type: none">Spearheaded the team of 50+ active members to rebuild and foster the CS culture at the university through weekly workshops and various events	Ashoka University <i>Aug 2022 – May 2024</i>
Entrepreneurship Club <i>Director of Events</i> <ul style="list-style-type: none">Ideated and organised various events, like Startup Ashoka, to encourage entrepreneurial spirit among students	Ashoka University <i>Jan 2022 – May 2023</i>
Mathematics Colloquium <i>Speaker</i> <ul style="list-style-type: none">Presented my paper on deBruijn sequences to senior undergraduates, Ph.D. students and faculty members	Ashoka University <i>April 2022</i>

TECHNICAL SKILLS

Programming: C/C++, Java, JavaScript, Python3, Solidity, Assembly, HTML/CSS, Shell, SML, SQL, XML, React.js
Tools: Qiskit, Hyperledger Fabric, Timeloop/Accelergy, Docker, Git, L^AT_EX
Others: Arduino, ESP32, Raspberry Pi Pico, PowerBi, WordPress, MS Excel
Languages: Hindi, English