

HARSH GUJARATHI

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EDUCATION

Birla Institute of Technology and Science, Pilani

Nov 2020 — June 2024

B.E. in Computer Science & Engineering (CGPA: 9.2)

Minor in Data Science

Relevant Coursework: Operating Systems, Data Structures and Algorithms, Object Oriented Programming, Computer Networks, Database Management Systems, Computer Architecture, Foundations of Data Science, Deep Learning, Computational Neuroscience, Large Scale Distributed Systems, Design and Analysis of Algorithms, Microprocessor and Interfacing, Quantum Computing and Information, Machine Learning on Resource Constrained Devices, Compiler Construction, Applied Statistical Mathematics, Theory of Computation, Discrete Structures in Computer Science

RESEARCH INTERESTS

I am passionate about advancing the frontiers of **distributed training methodologies**, **federated learning systems**, and **large language models (LLMs)**. I like to explore innovative techniques for optimizing model training across **heterogeneous computing environments**, developing **privacy-preserving** approaches to federated learning, and critically examining the capabilities of cutting-edge LLMs from organizations like DeepMind and OpenAI. Additionally, I would love to work and investigate the **computational optimizations** and **infrastructure requirements** essential for both training and deploying these sophisticated AI systems at scale in real-world applications.

TECHNICAL STRENGTHS

Computer Languages	Java, Kotlin, Python, JavaScript, C#, C++, Dart, Go
Frameworks	Flutter, Android Framework, .NET Framework, NodeJS, React, TensorFlow, PyTorch
Cloud & Databases	AWS, Azure, Google Cloud, Firebase, MongoDB, Redis, MySQL, PostgreSQL
Development Tools	Git, Android Studio, VSCode, Vim, Datadog, NumPy, Pandas, Qiskit, Figma

EXPERIENCE

Undergraduate Research Assistant, Secure Messaging Systems

January 2023 — Jan 2024

Prof. Kunal Korgaonkar, BITS Pilani

Goa, India

- Explored privacy-preserving techniques for metadata protection in messaging applications using blockchain technology
- Conducted a comprehensive review of open-source options for implementing privacy-based blockchain solutions
- Developed a prototype secure messaging system that maintains message authenticity while protecting user metadata
- Successfully scaled the implementation to support 100 concurrent users, validating the approach's feasibility
- Applied cryptographic primitives and distributed systems concepts to enhance data privacy while preserving functionality

Undergraduate Research Assistant, Assistive Technology Projects

August 2021 — December 2022

Prof. Neena Goveas, BITS Pilani

Goa, India

- Analyzed technical requirements for prosthetics manufacturers and developed a data collection solution for the Rotary Club
- Created a mobile-responsive application that streamlined information gathering for hundreds of disabled individuals
- Led a team of 7 students in designing and implementing an automated TA allocation system for faculty
- Developed allocation algorithms that optimized teaching assistant assignments based on course requirements and student preferences
- Provided technical support for various robotics projects using Arduino Uno, including sensor integration and movement control

- Implemented embedded systems solutions for real-time data processing and actuator control in assistive devices

TEACHING ASSISTANTSHIP

First Degree Teaching Assistant, Department of CSIS
BITS Pilani

Aug 2023 — Dec 2023
Goa, India

- **CS F372 — Operating Systems:** Assisted *Prof. Biju K.R.* in conducting labs and tutorial classes in basic concepts of C programming and Linux system calls. Prepared reading materials for labs and conducted doubt solving sessions.
- **CS F342 — Computer Architecture:** Assisted *Prof. Kanchan Manna* in conducting and evaluating weekly labs in HLD design labs in Verilog.

First Degree Teaching Assistant, Department of CSIS
BITS Pilani

Jan 2023 — May 2023
Goa, India

- **CS F211 — Data Structures and Algorithms:** Assisted *Prof. Sujith Thomas* in setting, testing and hosting weekly labs and evaluations for the course; conducted tutorial/problem solving sessions for students.
- **CS F342 — Computer Architecture:** Assisted *Prof. Amalin A. Prince* in conducting and evaluating weekly labs in Verilog based on MIPS and other architectures.
- **CS F424 — Software for Embedded Systems:** Assisted *Prof. Neena Goveas* in taking tutorials on Python and Android development.

First Degree Teaching Assistant, Department of CSIS
BITS Pilani

August 2022 — Dec 2022
Goa, India

- **CS F213 — Object Oriented Programming:** Assisted *Prof. Neena Goveas* in conducting and evaluating weekly labs based on Object Oriented concepts in Java; evaluated group projects and guided student teams toward implementing effective OOP principles.
- **CS F214 — Logic in Computer Science:** Assisted *Prof. A. Baskar* in conducting doubt solving sessions and guided students in weekly problem sheet solving.

SCHOLARSHIPS & AWARDS

Merit Scholarship Awardee

2020 - 2022

Birla Institute of Technology and Science, Pilani

Goa, India

- Scholarship awarded to the top 2% students in the college for their meritorious performance in Academics.

2nd Runner-up at ByteSynergy Hackathon

Feb 2022

IIIT Bangalore

Goa, India

- Won the 2nd runner-up award, along with 5000 as cash prize in Social Issues Track in Hackathon conducted by IIIT Bangalore.