

Saheli Ray

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EDUCATION

The University of Texas at Austin | College of Natural Sciences

Expected May 2026

Bachelor of Science in Computer Science

Austin, TX

- **Relevant Coursework:** Discrete Mathematics for Computer Science, Data Structures, Matrices & Matrix Calculations, Probability & Statistics, Computer Organization & Architecture, C/Linux Programming, Ethical Foundations of Computer Science, Foundations of Accounting, Foundations of Finance, Undergraduate Research- Machine Learning & Data Mining

SKILLS

Programming Languages: Java, Swift, C, Python, SQL

Technical Skills: AWS (S3, EC2, DynamoDB), GitHub, MS Office, Linux, Eclipse, VSCode, Xcode

Certifications: Oracle Financials Cloud: Payables 2024 Implementation Professional (*In-Progress*)

PROJECTS

Instagram & Twitter Hybrid Clone (*Swift*)

- Used Bitnami Parse API Server on Amazon EC2 to manage backend operations such as user authentication, image uploads, and real-time data storage.
- Integrated Amazon S3 for scalable storage of user-uploaded images, ensuring fast access and high availability for media assets.
- Designed and implemented core social media features including user profiles, photo & text posting, commenting, and liking functionalities.

chArm-v3 System Emulator (*C*)

- Designed and implemented hardware modules for a chArm-v3 CPU, including an ALU for mathematical and bitwise operations (addition, shifts) with conditional flag setting, and a register file supporting simultaneous read and write operations.
- Developed a 5-stage pipeline architecture (Fetch, Decode, Execute, Memory, Writeback) to improve throughput by enabling instruction overlap and forwarding data to dependent instructions.
- Engineered hazard control mechanisms to manage stalls and squashes, mitigating control and data hazards effectively.
- Implemented a cache controller simulator to optimize memory access and enhance overall pipeline performance.

Evil Hangman (*Java*)

- Developed a dynamic Hangman game with multiple difficulty levels that delays word selection until the last possible moment.
- Utilized Hash Maps to group words by patterns (e.g., "_ _ a _ _") based on guessed letters, maximizing the word pool options to avoid narrowing down to one word too soon.
- Implemented Hash Sets and Tree Sets to efficiently manage and retrieve the largest possible word groups.

Huffman (*Java*)

- Developed a Huffman encoding/decoding program to compress/decompress text files efficiently using variable-length codes for characters.
- Implemented binary trees, where more frequent characters were assigned shorter binary codes, improving data compression.
- Utilized priority queues (min-heaps) to repeatedly merge the two least frequent nodes for the tree-building process.
- Managed character frequency counts with a Tree Map, providing efficient lookups and binary code assignments during tree construction.

EXPERIENCE

UT Austin Department of Computer Science

Jan 2025 - Present

Undergraduate Research Assistant- Machine Learning & Data Mining Project

- Enhancing the National Diet Library, Japan's OCR application, ndlktocr-lite, to process dated Japanese texts with pronunciation guides, marginal context, and page demarcations.
- Implementing Python-based model updates to separate core text data from excess metadata for structured storage and retrieval.
- Refining text segmentation and metadata extraction to improve OCR accuracy and data organization.

DFW Kalakars

June 2022 - Present

Event Coordination & Creative Manager

- Strategize and maintain detailed program plans in spreadsheets for up to 4 months in advance, ensuring seamless execution of cultural events and initiatives.
- Reliably develop and maintain budgeting plans, reducing event costs without impacting quality while maximizing attendance, leading to a 33% increase in attendance at our flagship event, Durga Puja, from 600 attendees to 800 in a year.
- Planned and coordinated 5 children's dance programs, including creating custom music mixes on GarageBand, scheduling rehearsals, and adapting to online lessons to accommodate COVID-19 shifts, ensuring a sound production.
- Connected with local news channels (CBS Texas, KDFW Fox Dallas, NBC DFW) for press coverage of a peaceful solidarity march in the DFW area. Contacted officials and acquired approvals to provide a safe ground for the solidarity march.

LEADERSHIP & COMMUNITY INVOLVEMENT

UT Saaya, Austin, TX

Sep. 2023 - Sep. 2024

Production Committee Member & Dancer

- Applied artistic expertise to design and construct transportable PVC and cardboard structures ranging from 8' to 10' in height, ensuring they could be easily dismantled, reassembled, and transported across cities with minimal costs and logistical challenges.
- Delegated parts of movement and set up to other team members to ensure prop set up and breakdown were coordinated and efficient.

Texas Guadaloop, Austin, TX

Sep. 2022 - Sep. 2023

Fundraising Lead

- Secured \$19,354 in funding by applying for and acquiring the Green Fund grant, which became the primary source of financial support.
- Led and delivered a high-impact presentation to the Dean of Cockrell Engineering, showcasing Guadaloop's potential and achievements to secure sponsorship and endorsement for R&D and European Hyperloop competition costs, effectively raising support for critical project phases.
- Developed plans and crafted persuasive sponsorship letters that expressed Guadaloop's valuable aspects to attract corporate sponsors.
- Successfully acquired sponsorship from Blue Origin, strengthening our financial foundation and brand credibility.