

RUCHIKA SHIRSATH

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EDUCATION

Georgia Institute of Technology
Doctor of Philosophy in Computer Science

August 2025 - Present
Atlanta, GA

Veermata Jijabai Technological Institute (VJTI)
Bachelor of Technology in Information Technology
• CGPA: 9.16/10 (Up to Semester 6)

December 2021 - July 2025
Mumbai, India

RELEVANT COURSEWORK

- | | | | |
|----------------------|-------------------------|------------------------------|---------------------------|
| • Compiler Design | • Computer Architecture | • Computer Networks | • Artificial Intelligence |
| • Parallel Computing | • Operating Systems | • Linear Algebra | • Machine Learning |
| • Data Structures | • Software Engineering | • Discrete Mathematics | |
| • Algorithms | • Database Management | • Statistics and Probability | |

RESEARCH EXPERIENCE/INTERNSHIPS

CSE Dept., IIT Bombay
Undergraduate Researcher

June 2024 – Ongoing
Mumbai, India

Supporting the implementation of CoS-SSA: C++, LLVM, Clang

- Working on supporting the implementation of Context Sensitive SSA (CoS-SSA), to extend Static Single Assignment (SSA) from intraprocedural to interprocedural analysis with a focus on context sensitivity.
- Testing CoS-SSA implementation by creating manual and fuzz-generated test cases to address potential weaknesses.
- Working on developing a visual representation of def-use relations using CoS-SSA in an IDE like Visual Studio.

CSE Dept., IIT Bombay
Undergraduate Research Intern

Feb 2023 – June 2024
Mumbai, India

Software Plagiarism Detection Tool: C, C++, Python, Java, Gumtree, CSmith, MOSS

- Crafted a multi-language software plagiarism detection tool under *Dr. Uday Khedker*, utilizing Abstract Syntax Trees (AST). Employed the Zhang-Shasha algorithm to account for numerical similarity between source codes and Gumtree to account for visual differences.
- Developed algorithms and strategies to enhance MOSS (Measure of Software Similarity), addressing its limitations to improve accuracy and effectiveness in plagiarism detection.
- Deployed the tool in the **CS302 (Compiler Design)** course in the CSE Dept at IIT Bombay to assess and detect plagiarism in student submissions, with plans to extend its use across other courseworks and languages.

Computer Engineering & Information Technology Dept., VJTI
Undergraduate Research Assistant

July 2023 – Ongoing
Mumbai, India

Acoustic-Based Tuberculosis Detection Using Cough Analysis: Python, Flutter, AI-ML

- Developed a feature extraction pipeline for Tuberculosis detection using cough recordings and metadata, focusing on Mel-frequency cepstral coefficients.
- Implemented a CNN model for enhanced accuracy in voice-based detection, fusing it with a metadata-based model for symptom-driven insights and improved diagnostic accuracy.
- Deployed a mobile app (currently in the testing phase) with KEM Hospital data. Filed for a national patent to support National Tuberculosis Elimination Program (NTEP), with plans to collaborate with Accredited Social Health Activist (ASHA) workers to expand TB detection and awareness in rural communities

Citi Bank
Summer Analyst Intern

June 2024 – July 2024
Pune, India

AI/ML Forecasting and Predictive Modeling: Python, AI-ML

- Developed and implemented a range of AI/ML models for Announcement and Position Forecasting, including Linear Regression, k-NN, Stochastic Gradient Descent, ARIMA, and LSTM, achieving about 18% more accuracy than traditional Monte Carlo simulations at Citi.
- Conducted exploratory data analysis, preprocessing, and visualization using Jupyter Notebook, Scikit-learn, Pandas, and Matplotlib to enhance forecasting capabilities.

ACADEMIC PROJECTS

Intelligent Navigesture [VJTI, Mumbai]

Oct 2022 – Feb 2023

Team Size: 4

Role: Team Member

OpenCV, Machine Learning, Deep Learning

- Developed gesture recognition using OpenCV, Mediapipe, Pyautogui, and Pycaw, enabling precise user interactions (clicking, sound control, scrolling).
- Iteratively refined gesture recognition models and optimized frontend performance to deliver a user-friendly, hands-free web interface.

QR-Face Attendance System [VJTI, Mumbai]

Dec 2022 – Feb 2023

Team Size: 5

Role: Team Leader

OpenCV, DBMS, HTML, CSS, JS, Flask

- Developed a web-based attendance system with multi-factor authentication, integrating QR code scanning and face detection using OpenCV, Pyzbar, Face Recognition, CVZone, and PyMongo.
- Implemented secure data storage with Firebase and a two-step verification process, utilizing HTML, CSS, JavaScript, and Flask for a robust front-end and back-end solution.

The Assist Bot [VJTI, Mumbai]

Dec 2022 – Jan 2023

Team Size: 2

Role: Team Leader

Python, Tkinter, Speech to text, Text to speech recognition

- Developed a Python bot with Tkinter, integrating Speech-to-Text and Text-to-Speech for voice and text-based command execution.
- Enhanced usability with natural language interactions and a Tkinter-based GUI for an intuitive multi-modal user experience.

VJTI Website [VJTI, Mumbai]

July 2023 – July 2024

Team Size: 5

Role: Team Member

HTML, CSS, JS, Bootstrap, Django

- Redesigned and developed a dynamic college website, significantly improving user experience for students and faculty through enhanced interactivity and modern design, surpassing the previous version.

TECHNICAL SKILLS

Programming Languages: C, C++, Java, Rust, Python, MATLAB, SQL

Technologies/Frameworks: LLVM, Clang, Linux, GitHub, PyTorch, TensorFlow, OpenCV, Numpy, Matplotlib, Seaborn, Pandas

Domains Explored: Programming Languages, Compilers, Machine Learning, Deep Learning, Computer Vision, Artificial Intelligence, Web Development, Digital Image Processing

ACHIEVEMENTS/CO-CURRICULAR/EXTRACURRICULAR

- Secured **Rank 2** in the Infrastructure domain at the VJTI Centenary TechHackathon 2023 for developing an attendance system with QR code and Face detection technology. Currently finalizing deployment for college use.
- Among the **Top 10%** of the Information Technology Department students at VJTI with a **CGPA of 9.16/10**, Present.
- **Two-time invitational national silver medalist** in archery. Achieved **Rank 11** among girls and **99.79** percentile in MHT-CET, a highly competitive engineering entrance examination, March 2021.

LEADERSHIP ROLES

- Co-founder of Research@VJTI, October 2024 - Present
- Department Head of IT Branch, Technovanza - 2023, VJTI.
- Student Representative at VJTI - 2023.
- Core Member of the Community of Coders (COC), VJTI, January 2022 - Present
- **COC@VJTI:** Conducted a workshop for 150+ juniors on domain exploration and Web Development, July 2023.
- **COC@VJTI:** Mentored 100+ juniors in foundational C++ programming, August 2023.

COMMUNITY INVOLVEMENT

- Organized awareness camps as the Campus Ambassador and member of the Multi Organ Harvesting Aid Network (MOHAN) foundation to raise awareness about organ donation, contributing to the social cause. (August 2022 - Present)
- Front-End Web Developer at Enactus VJTI, which works for the sustainable development of under-resourced entrepreneurs. (January - October 2023)