

Pratyush Pathak

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EDUCATION

Rutgers University – New Brunswick

Bachelor of Science in Computer Science

New Brunswick, NJ

Sep. 2023 – May 2027

- Cumulative GPA: 3.85 / 4.0; Major GPA: 3.9 / 4.0
- Honors: **Dean's List** (All Semesters); SAS Excellence Scholarship
- Relevant Coursework: **Data Structures, Software Engineering, Systems Programming**, Data Science, Computer Architecture, Advanced Mathematics

EXPERIENCE

Mathematics Learning Assistant

Sep. 2025 – Present

Rutgers University

New Brunswick, NJ

- Lead weekly collaborative learning sessions for 20+ Precalculus students, focusing on **algorithmic problem-solving** and **logical reasoning**
- Developed **targeted review packets** and **interactive problem-solving sessions** based on student feedback, resulting in **highly positive commendations** from faculty for improving student engagement and conceptual understanding
- Mentor peers in logic-based problem decomposition, simplifying complex **mathematical concepts** for diverse audiences

PROJECTS

Portfolio & Blog Platform | *React, Python, Flask, SQLite, Oracle Cloud*

Nov. 2025 – Current

- Designed and deployed a **full-stack, dynamic portfolio website** with an integrated blog **content management system (CMS)**
- Built a secure **RESTful API** using **Python** and **Flask** for creating, editing, and deleting blog posts, with user authentication handled by **JWT**
- Developed a responsive, component-based frontend with **React**, using **React Router** for page navigation and a Markdown parser to render blog posts

Car Rental System | *Java, JavaFX, Data Structures, MVC, JUnit, Git*

Sep. 2025 – Oct. 2025

- Collaborated in a pair to develop a comprehensive fleet management system supporting vehicle reservations, trip tracking, and cost reporting
- Engineered **custom data structures** (resizable arrays, circular linked lists) to efficiently manage fleet, booking, and trip subsystems
- Applied the **Model-View-Controller (MVC) design pattern** to build a responsive **JavaFX** GUI, separating business logic from the user interface
- Authored extensive **JUnit test suites** to ensure functional reliability for date validation and cost computation logic

Handwritten Digit Classifier | *Python, TensorFlow, Keras, NumPy, Matplotlib*

Jul. 2025 – Aug. 2025

- Built and trained a **Convolutional Neural Network (CNN)** using **TensorFlow** and Keras to classify digits with **98% test accuracy**
- Implemented **data augmentation** and normalization preprocessing techniques to improve model generalization and **prevent overfitting**
- Developed a GUI for real-time digit drawing and prediction with confidence-score visualization

CPU and Cache Simulator | *C, Computer Architecture, GDB*

Apr. 2025 – May 2025

- Simulated a **5-stage RISC-V execution pipeline** (Fetch, Decode, Execute, Memory, Writeback) in C to run R-, I-, S-, and B-type instructions
- Implemented a **1 KiB direct-mapped data cache** with block fill, write-back, and inspection utilities
- Modeled core CPU components including the ALU, control unit, and register file with correct control signal logic

SKILLS

Languages: Java, Python, JavaScript, C/C++, SQL, HTML/CSS

Frameworks & Libraries: React, Flask, TensorFlow, Keras, Pandas, NumPy, JUnit, JavaFX, Matplotlib

Databases: SQLite, PostgreSQL, MySQL

Developer Tools: Git, Docker, Oracle Cloud, Linux, GDB, IntelliJ, VS Code, Eclipse