Pratyush Pathak

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Education

Rutgers University New Brunswick, NJ

Bachelor of Science in Computer Science *Sep. 2023 – May 2027*

- Cumulative GPA: 3.85, Major GPA: 3.9
- Honors: Deans List every semester; SAS Excellence Scholarship for academic excellence
- Relevant Coursework: Data Structures, Data Science, Systems Programming, Computer Architecture, Software Engineering, Advanced Mathematics

Experience

Mathematics Learning Assistant Sep. 2025 – Present

Rutgers University *New Brunswick, NJ*

- Lead weekly collaborative learning sessions for 20+ Precalculus students, facilitating problem-solving and conceptual understanding through structured analytical reasoning
- Partner with faculty to design and implement data-driven learning interventions that enhance student engagement and retention of core quantitative concepts
- Develop and communicate complex mathematical ideas clearly to diverse audiences, strengthening technical communication and instructional effectiveness
- Mentor peers in logic-based problem decomposition and systematic reasoning

Projects

Car Rental System | *Java, JavaFX, Data Structures, MVC, JUnit, Git* Sep. 2025 – Present

- Collaborated with a partner to develop a comprehensive fleet management system supporting vehicle reservations, trip tracking, and cost reporting across multiple campuses
- Designed modular subsystems for fleet, booking, and trip management using custom resizable arrays and circular linked lists
- Refactored system architecture with inheritance and generics to support multiple vehicle types and implement surcharge-based cost calculations
- Implemented a JavaFX graphical interface applying the Model–View–Controller (MVC) pattern for enhanced interactivity and maintainability
- Created JUnit test suites to verify date validation, vehicle comparison, and cost computation for functional reliability

Handwritten Digit Classifier | *Python, TensorFlow, NumPy, Matplotlib* Jul. 2025 - Aug. 2025

- Built and trained a convolutional neural network on the MNIST dataset to classify handwritten digits with 98% test accuracy
- Preprocessed image data with normalization and augmentation to improve model generalization
- Implemented visualization tools to display predictions and confidence scores alongside test images
- Extended functionality with a GUI for real-time digit drawing and prediction

CPU and Cache Simulator | *C, Computer Architecture* Apr. 2025 – May 2025

- Simulated single-cycle RV64I CPU supporting R-, I-, S-, and B-type instructions with correct control signals
- Built 5-stage execution pipeline with Fetch, Decode, Execute, Memory, and Writeback stages
- Implemented direct-mapped data cache (1 KiB) with block fill, writeback, and inspection utilities

Skills

Languages: Java, Python, C/C++, JavaScript, SQL, HTML/CSS
Developer Tools: Git, Docker, Linux, SSH, Oracle Cloud, AWS, VS Code, IntelliJ, PyCharm, Eclipse
Frameworks & Libraries: JavaFX, Pygame, NumPy, Pandas, Matplotlib, Node.js, JUnit
Databases: MySQL, PostgreSQL, SQLite