JAI VIVEK NAGARAJ

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EDUCATION

Bachelor of Science, Computer Science (Turing Scholar) **GPA: 3.9**/4.0 Aug 2024 – May 2027
The University of Texas at Austin, Austin, TX completed 102 credits

- Relevant Coursework: Operating Systems Honors | Data Structures Honors | Computer Architecture Honors | Discrete Math Honors | Game Theory | Matrices & Linear Algebra

Liberal Arts and Science Academy HS, Austin, TX Weighted GPA: **4.83**/4.0 May 2024

- 2024 National AP Scholar on 14 Advanced Placement Courses | Earned *highest overall GPA* in class of 2024

EXPERIENCE

CLeAR Lab, ODEN Institute at the University of Texas at Austin Mar 2025 – Present

- Researching the intersection of control theory, game theory, and reinforcement learning applied to autonomous robotics under **Prof. David Fridovich-Keil**.
- **Published paper:** "Data-Driven Modeling and Correction of Vehicle Dynamics", 2025
    - Use data-driven methods to correct control inputs to robots given physics-based dynamical model and actual trajectory data
    - To be published in the Journal of Machine Learning for Modeling and Computing
- Implemented novel game-theoretic motion planning algorithm in Python for hybrid-information environments, paper pending. Tested real-time on NVIDIA JetRacer hardware.
- Designing reinforcement learning algorithm in Python for aerial robots to optimize objective performance while learning environment dynamics via a memory-efficient Kalman Filter.

Software Projects

- **DoomOS:** Collaborated with peers to build a UNIX-style, multi-core OS in C++. Contributed by implementing a working subset of the X Window System (X11) and a terminal emulator. Nov 2025 – Dec 2025
- **Game Boy Emulator:** Created an emulator for the Nintendo Game Boy Classic Console in C++. Emulates the entire SM83 ISA, memory bus controller, and graphics unit concurrently. Apr 2025 – May 2025
- **Web Crawler and Search Engine:** Built a web crawler in Java to form a positional inverted index of the web and perform complex webpage retrieval queries via a recursive descent parser. Nov 2024 – Dec 2024

WORK EXPERIENCE & ACTIVITIES

Executive Vice President, Freetail Hackers Organization, University of Texas at Austin Feb 2025 – Present

- Worked with university deans and administration while managing a team of 50 students to run nationwide hackathons hosting 1500+ student hackers with a budget of over $70K.

Cybersecurity Division Intern, Texas Department of Public Safety, Austin, TX Jun 2023 – Aug 2023

- Implemented policies, performed risk analysis, and created System Security Documentations for DPS security that aligned with NIST 500-83 benchmarks.
- Served as interim penetration tester for Windows 7 and 10 operating systems.

ACADEMIC AND COMMUNITY AWARDS

University Honors List, University of Texas at Austin Fall 2024, Spring 2025
National Merit Scholar, USA May 2024
Graduation with Highest Honors, Liberal Arts and Science Academy (Top 2% of class) May 2024
Gold Medal, President's Volunteer Service National Award (250+ hours) April 2024

TECHNICAL SKILLS

Programming Languages: Python | C/C++ | Java | HTML/CSS/JS | Go | x86/AArch64 ASM
Software libraries: ROS 1 | Jax | NumPy | PyTorch