

# Denny Cao

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## EDUCATION

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### Harvard University

Bachelor of Arts in Computer Science, Neuroscience, and Economics

Cambridge, MA

Aug. 2023 — May 2027 (Projected)

### Julia R. Masterman High School

High School Diploma

Philadelphia, PA

Aug. 2019 — June 2023

- Relevant Coursework: MATH 163 and 263: Discrete Mathematics 1 and 2, MATH 1410: Multivariable Calculus, MATH 1700: Ideas in Mathematics, MGMT 0004: Work, Power and Inequality, FNCE 0002: Essentials of Personal Finance, AP Computer Science A, AP Physics C: Mechanics and Electricity & Magnetism, AP Calculus BC
- GPA: 3.9/4.0

## EXPERIENCE

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### Marketing & Fundraising Manager/Programming Lead

SLAM Robotics

Sept. 2019 — June 2023

Philadelphia, PA

- Led team of 5 in rebranding the team, including designing a new website and creating a fresh logo
- Wrote comprehensive documentation for team's codebase to facilitate onboarding of new members
- Utilized Java and OpenCV to program robot's autonomous and teleop code, incorporating AprilTag detection
- Reached FTC Pennsylvania State Championship in 2023

### Web Developer

Philadelphia Trail Club

May 2022 — Jan. 2023

Philadelphia, PA

- Revamped the website to improve accessibility for over 150 senior citizen members
- Implemented Salesforce to manage membership and event registration, reducing workload of the club's treasurer

### Robotics Research Assistant

University of Pennsylvania

June 2022 — August 2022

Philadelphia, PA

- Developed a Python script to generate heightmaps for environments in the Gazebo simulator, enabling the creation of diverse training data
- Created realistic simulations of objects on a desk using procedural generation techniques, allowing for practical scenarios and real-world testing
- Provided visualization tools in RViz that facilitated the understanding of the robot's current and target positions, aiding in error analysis and fine-tuning of robotic movements

## PROJECTS

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### RoboDog | C, Java, Arduino, CAD, KiCad

June 2022 — Dec. 2022

- Built a robot guide dog to assist the visually impaired
- Implemented a communication system using Bluetooth to establish a connection between the robot and an Android phone, allowing for real-time exchange of GPS coordinates and goal information
- CADed using OnShape to design the robot's chassis
- Employed KiCad to map out schematics and for Arduino-based control systems

### Trash Collector | Java, Python, TensorFlow, pandas, CAD, Git

May 2023

- Collaborated with a team of 7 to develop a robot that can autonomously collect trash and sort it into recyclables and non-recyclables
- Utilized TensorFlow to train an object detection model to detect trash and recyclables
- Implemented a PID controller to control the robot's movements
- Worked with team using Git for version control, enabling efficient and organized collaboration throughout the development process

## TECHNICAL SKILLS

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

**Libraries:** TensorFlow, OpenCV, pandas, NumPy, Matplotlib, PIL