ISAAC RUDNICK

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EDUCATION

BA in Computer Science, Vassar College — 3.96 GPA — Expected 2026

Relevant Coursework: Autonomous Robotics Design, Compilers, Algorithmic Analysis, Computer Architecture and x86 Assembly, Software Design and Architecture, Multivariable Calculus, Linear Algebra, Perception and Action of Autonomous Agents (for Robotics)

Diploma, Westtown School — 94.6 GPA — 2022

Honors & Awards: The Kaesemeyer Leadership Award (Highest award), The Lane Math Award, The A. Higley Gilbert Information Technology Award, and The Craft Award.

SKILLS

Languages	Python, Javascript, Java, OCaml, MATLAB, C/C++, x86-64 Assembly, HTML/CSS.
Technologies	Fusion360, NumPy/Pandas/Matplotlib, Node.js, MongoDB, Docker, Android Studio, Arduino

EXPERIENCE

Robotics Design Engineer (Summer) — May - August 2025

Vassar College — *Poughkeepsie, NY*

- Summer research internship to develop low-cost open-source robotic humanoid arm.
- Worked with small team to develop robotic shoulder, elbow, forearm, wrist, and hand.
- Developed GUI for control of feedback-integrated servo motors.
- Advised on integration of sensors for proprioceptive-like feedback.

Robotics Lab Research Assistant — Oct 2023 - Present

Vassar College — *Poughkeepsie, NY*

- Academic Year position
- HARPER (Humanoid Autonomous Robotic Platform for Experimental Research) programmer
- Hired due to experience in programming and robotics
- Developing systems to run multiple ML models concurrently in Nvidia's ROS
- Work includes 3D visual perception, object recognition, scenic mapping, and systems integration

Robotics Software Developer (Summer) — May - August 2024

Vassar College — *Poughkeepsie, NY*

- Summer research internship, hired for programming and robotics experience.
- Created a closed-loop robotic controller in Python and C++
- Created a prototyping robotics system for testing the movement controllers
- Worked with other software developers and physical fabricators to communicate about project requirements/goals

CS Teaching Assistant — Jan 2023 - Jan 2024

Vassar College — *Poughkeepsie, NY*

- Assisted students with course material and in labs, discussing optimal techniques and solutions
- Discussed course material with professors to guide course direction
- Held independent office hours for students to review material
- Handled multiple concurrent labs across rooms in a team

PROJECTS

Robotics Software Development Platform Independently designed, developed, and tested a Serial Perception-Action Robotic Control and Communication Platform (SPARCC Platform) to facilitate serial communication and control between Python and Arduino, streamlining research and education projects at Vassar College for the HARPER robotic platform. This extensible system supports control over PWM servos, stepper drivers, and sensors, with modular classes in Python and corresponding headers in Arduino C++ code. Designed for easy expansion, SPARCC allows new components to be integrated with minimal code changes on both ends. The setup is configured for optimal speed and reliability.
View the source code here.

Blood-Glucose LED Display Designed and built a complete ESP32-powered display system for visualizing real-time blood glucose data on a 32×8 WS2812B RGB LED matrix. This open-source project integrates microcontroller firmware, a custom 3D-printed enclosure, and modular configuration files to function as an alternative to existing commercial products. The display supports adjustable brightness profiles, day/night modes, and more. The enclosure, diffuser grid, and mounting hardware were designed from scratch to ensure even illumination and simple assembly, and can be reused for any LED-matrix-based project regardless of software.
View the source code here.

Whiteboard-Drawing Robot Independently designed, developed, and tested VectorPlotter, a robotic drawing system that draws images on a whiteboard or similar surface. This open-source project includes both software and hardware components. It uses the SPARCC Platform, shown above, as a base. The Python interface reads SVG files, automatically scales and positions images, and sends streamlined drawing commands to the Arduino. Developed with easy assembly and configuration in mind, VectorPlotter includes simple guides for hardware setup and software configuration, ensuring that anyone could recreate the project.
View the source code here.

School Calendar System Independently designed, developed, and tested an application (made in Node.js with Express and MongoDB) to automatically synchronize user calendars from third-party source to respective Google Calendar to increase scheduling efficiency and simplicity. Developed for use by school students and employees, to be managed by in-house technology department after graduation. updates entries without webhooks, designed for >100,000 API calls/week.
View the source code here.

Blood Sugar Alert App Built a project (made in Node.js with Express, MongoDB, and Python) that reduces false positive alerts to diabetics' emergency contacts when dangerous levels are detected by first ensuring the user is non-responsive. Developed in conjunction with research on "alarm fatigue."
View the source code here.

TikTok Discord Bot Built a Discord messenger bot (in Python with Docker and FFmpeg, then a second release in NodeJS and Docker) that downloads videos and slideshows from TikTok for local use, manipulation, and analysis. Simple user interface and response, over 22,000 uses.
View the source code here.

Vassar Course Data Analysis A project to analyze the course data of Vassar College provided online by the registrar's office. This project contains analysis of trends in course offerings, course popularity, and per-department statistics meant to inform the policies of the college to promote cross-discipline learning, such as by examining departments which have overly-rigid policies for introductory courses. The project also features guidelines for further analysis of the data by other interested students / faculty, along with tools to make this analysis easier. Written in Python using pandas and Jupyter Notebook.
View the source code here.

Vassar Dining Plus An Android app to improve upon Vassar's existing dining services website. This app has more features than the official website, such as the ability to favorite dishes and check which favorites are being served, a more persistent allergen profile, and offline browsing via cached menus. The app features a MVC architecture, unit and system/integration testing, Javadoc for all functions, use cases, activity diagrams, functional and nonfunctional specifications, test reports, class diagrams for all major features, and more. Made using Android Studio.
View the source code here.