IAN HENRIQUES

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SUMMARY

- Ph.D. student at MIT, with a focus on training and applying foundation AI models for medical applications
- Versatile engineer with a Princeton graduate degree, industry experience at NVIDIA, and research in AI and robotics
- Deep expertise in machine learning, robotic systems, computer architecture, signal processing, and embedded programming
- Proven ability to rapidly prototype and deliver high-quality, robust software and firmware solutions
- Recognized for adaptability, technical breadth, and cross-domain problem-solving across academic and industry settings

EDUCATION

Massachusetts Institute of Technology *Sep 2026 – Present*
Ph.D. in Electrical Engineering & Computer Science (Medical AI)
Honors & Awards:
- **HDTV Grand Alliance Fellowship** [2026] – selected for funding award, given exemplary academic and research achievements

Research:
- **Medical AI @ Katabi Lab** [2026 –]

Princeton University *Sep 2025 – May 2026*
Masters in Electrical & Computer Engineering (Robotics + Machine Learning) GPA: 4.000 (4 A+'s, 4 A's)
Research:
- **Machine Learning @ Jha Lab** [2025 – 2026] – first author, lead ML contributor, and primary writer of papers on diabetes detection
  - Publication: *SweetDeep: A Wearable AI Solution for Real-Time Non-Invasive Diabetes Screening*
  - Publication: *Machine Learning for Type 2 Diabetes Prediction using Continuous Glucose Monitors*
- **Robotics @ Silver Lab** [2025 – 2026] – improving real-to-sim-to-real transfer through perception and simulation research
  - Internal Research: *Optimizing Robust Object-Centric Prompts for VLM-Based Robot Perception*
  - Internal Research: *Building a Kinematic Simulator for the Princeton Robot Planning and Learning Lab*

Outreach:
- **Robotics @ Silver Lab** [2026] – built a Scratch-like website, then utilized it to teach robotic abstractions to middle-school students

Princeton University *Sep 2021 – May 2025*
B.S.E. Electrical & Computer Engineering + Minor in Neuroscience – Class Rank 1 of 1305 GPA: 4.000 (18 A+'s, 18 A's)
Honors & Awards:
- **Class of 1939 Award** [2024] – honored for the single highest academic standing among 1300+ members of Princeton's Class of '25
- **James Hayes-Edgar Palmer Prize** [2025] – recognized for excellent scholarship, leadership, and creativity in engineering work
- **G David Forney Jr Prize** [2025] – awarded for an outstanding record in communication science, systems, and signals coursework
- **2x Shapiro Award for Outstanding Academic Achievement** [2022, 2023]; **Manfred Pyka Memorial Physics Prize** [2022]
- **1st Place in Harvard's Pacbot Robotics Competition** [2023]; **2nd Place in the Princeton Computer Science Contest** [2023]

Leadership:
- **President, Mentor, Software + Firmware Lead on Princeton Robotics Team** [2023 – 2025] – led Pacbot and Golf Cart teams
- **Campus Service Leader of Loaves & Fishes** [2023 – 2025] – volunteering to feed homeless and low-income residents

Research:
- **Robotics @ Fisac Lab** [2024 – 2025] – developed an ILQR-based self-driving approach to refine obstacle avoidance on model trucks
- **Machine Learning @ Jha Lab** [2025] – trained accurate, compact, and well-calibrated smartwatch disease detection models
  - Undergraduate Thesis: *Real-Time Disease Detection with Energy-Based Models*
  - Internal Research: *PreCEPT: Pretraining Classifiers using Energy-based Priors and Teachers*
- **Hardware @ Martonosi Lab** [2024] – designed and verified a pipelined accelerator for chaining frequent priority queue operations

University of Central Florida *Aug 2019 – Dec 2020*
Dual Enrollment (During High School) – Burnett Honors Scholar GPA: 4.000 (5 A's)

Seminole High School *Aug 2017 – May 2021*
International Baccalaureate Diploma – Class Rank 1 of 1030, Valedictorian, Physics Olympiad Qualifier GPA: 4.000

EXPERIENCE

Full-Stack AI Software Engineer, General Translation – LLM-Based Agent Development *Jun – Aug 2026*
- Completed and deployed an end-to-end service for translating and formatting Google Slides decks using Vision-Language Models, with built-in version control, carefully designed billing, and lazy formatting updates upon changing content
- Integrated GitHub and Slack webhooks for a code localization agent, accelerating the developer feedback loop
- Hypothesized and validated edge-case vulnerabilities within the agent's billing pipeline, correcting them to prevent under-billing
- Architected an automatic validation pipeline to benchmark and patch regressions in natural language translation quality
- Expanded the suite of supported file formats for translation – including Lottie and SVG – using vision-language agents

Data and AI Engineering Consultant, NeuTigers – Disease Detection Modeling *Jun – Dec 2025*

- Collaborated with clinical team to process and synchronize wearable sensor data streams for disease classification dataset creation
- Engineered and validated a new approach to train transformer and multilayer perceptron models on physiological timeseries data, while also refining calibration and improving consistency of model performance across training runs
- Constructed and selected clinically relevant features, then trained 100x smaller classifiers with 10+% higher accuracy and F1 scores
- Tripled model iteration speeds by automating parallel multi-fold training and evaluation within existing CI/CD infrastructure
- Coordinated the integration of machine learning screening models into smartwatches, using C++, Java, and Android Studio

Machine Learning Researcher, Princeton University – Medical Energy-Based Models *Jun – Aug 2025*

- Built a Python library for training energy-based model classifiers across diverse (tabular & physiological) disease detection tasks
- Achieved state-of-the-art accuracy on multiple proprietary clinical datasets using a novel energy-based model distillation approach
- Enabled out-of-distribution detection and semi-supervised learning in existing tabular datasets via energy-based modeling
- Conceived and mentored an undergraduate research project using calibrated models for differential diagnosis applications
- Supported data processing and model training for a post-doctoral project that predicts emotions using physiological signals

Teaching Assistant, Princeton University – Robotics, ECE, CS, Math, Physics *Sep 2022 – May 2025*

- Led tutoring, assignment help, lab design, and teaching for nine courses: Physics, Advanced Vector Calculus, Advanced Mechanics, Programming Systems, Algorithms, Logic Design, Circuits, Autonomous Systems Lab, Intelligent Robotic Systems
- Assisted over 200 students with problem set questions, labs, debugging code, and exam preparation

System Software Intern, NVIDIA (III) – Datacenter Software Benchmarking *May – Aug 2024*

- Introduced a framework for automatic profiling, performance analysis, power analysis, and visualizations of runs across multiple data center cluster workloads, and fully integrated it into the team's standard set of tools
- Devised and deployed an Ansible tool which automatically tracks and visualizes usage of shared testing boards
- Planned and launched a new CI/CD pipeline to catch bugs introduced into a widely used internal benchmark testing suite
- Tested and enhanced a kernel driver that uses Linux tracing to sample profiling events for fast workload characterization

System Software Intern, NVIDIA (II) – Embedded OS Performance Analysis *May – Aug 2023*

- Augmented an interactive and comprehensive cloud-based kernel event analysis tool, used by automotive engineers and customers to identify ways to improve startup and runtime efficiency of OS and virtualization layers on the Drive Orin
- Automated the process of diagnosing common performance issues by constructing a pipeline to analyze OS trace logs
- Debugged and improved a real-time lightweight utility for estimating CPU and memory utilization in self-driving cars

System Software Intern, NVIDIA (I) – Datacenter Power Monitoring *May – Aug 2022*

- Conducted exploratory research of power measurement approaches for the Grace CPU superchip
- Studied, modified, and wrote kernel device drivers, Device Tree bindings, ACPI table entries, and bash scripts to configure and process power sensor inputs to the chip to enable power telemetry and monitoring
- Added enhancements to a power analysis tool, allowing for interactive visualizations of large traces of power and thermal data

Software Intern, EIZO Rugged Solutions – Embedded Hardware Testing *May – Aug 2021*

- Implemented testing libraries in C and C++ to evaluate and summarize the real-time performance, thermal, and power metrics of embedded NVIDIA Quadro GPUs, PCIe connections, and the company's graphics cards
- Demonstrated graphics and multiprocessing capabilities of hardware through TensorFlow and OpenCV applications

Open-Source Software Projects

• Extending a framework for Diffusion Planning to allow arbitrary timestep skips	*Python*	*Oct 2025 – Present*
• Replicated a recent paper on Flow-Based Max-Ent Reinforcement Learning	*Python*	*Mar – May 2025*
• Created and maintained the Pacbot Robotics Competition's infrastructure	*Go, Svelte.js, Python*	*Jul 2023 – Apr 2024*
• Developed the Princeton University Robotics Club website from scratch	*React.js*	*Jul – Sep 2023*
• Adapted the MPPT algorithm for a home-made breadboard solar charger	*C++*	*Apr – May 2023*
• Designed a variant of the A* algorithm for more efficient UAV collision avoidance	*Python*	*Aug 2019 – May 2020*

SKILLS

Programming Languages: Python (Pandas, NumPy, PyTorch, TensorFlow, JAX, MuJoCo, Gym), C, C++, Bash, Assembly, Verilog, Rust, SQL, CUDA, Go, Java, TypeScript, JavaScript, Dart, CSS, HTML

Tools/Technology: ROS, Jupyter, Prisma ORM, AWS Lambda, Marimo, Altium, SolidEdge CAD, SPICE Simulation, Xilinx Vivado, Grafana, Ansible, GitLab CI

Hardware Experience: Arduino (Mega, STM32, Teensy), Raspberry Pi (Zero, 4), NVIDIA Jetson (TX2, NX, Orin), FPGA (Xilinx Artix 7)

Machine Learning: Supervised ML, Energy-Based Models, Transformers, CNNs, VAEs, Normalizing Flows

Robotics: Q Learning, Policy Gradient RL, Maximum-Entropy RL, Sim-to-Real Transfer, Imitation Learning, A* Planning, ILQR for Trajectory Optimization, Diffusion Trajectory Optimization