Rebecca Ramnauth
(347) 693-7931 · rebecca.ramnauth@yale.edu
Portfolio: rramnauth2220.github.io/ (robots, videos, publications)

AI engineer building autonomous systems that operate reliably in real-world environments, with end-to-end ownership from model design, software and hardware development, to deployment at scale.

- 5 robots deployed across homes (300+ families), clinics (8 units), and schools (35 classrooms; 500+ children)
- 12,000+ hours of continuous, fully autonomous runtime, robust to real-world uncertainty
- 3,000+ user sessions; 84+ TB multimodal data collected
- Multiple Best Paper Awards at flagship ACM and IEEE venues

Technical Skills

- Languages: Python, C++, Java, TypeScript, SQL
- AI Systems: LLM systems (multi-agent), multimodal learning (vision, audio), sensor fusion
- ML Engineering: Distillation, pruning, quantization for low-latency, resource-constrained deployment
- Systems: real-time systems, distributed pipelines, large-scale data processing
- Tools: PyTorch, OpenCV, ROS, scikit-learn, cloud GPU environments (VAST.ai)
- Hardware: embedded systems, predictive maintenance, CAD & digital fabrication

Experience

Postdoctoral Fellow (AI & Robotics), Yale University 2025 – *current*

- Developed runtime constraint frameworks for safe, real-time control of human-facing AI systems
- Designed and released 4 novel robotic platforms currently adopted and in use for research
- Contributed to OECD AI capability benchmarks shaping global policy (report link)
- Secured and contributed to $2M+ in NSF and NASEM funding of large-scale AI system development

Principal Data Scientist, Business Ethics & Compliance, Con Edison 2016 – 2019

- Led development for enterprise risk and compliance systems, enabling cradle-to-grave tracking of operational risk and change management
- Designed data pipelines and parsers supporting regulatory workflows across 60+ departments
- Developed predictive models for software risk across enterprise development frameworks
- Standardized and optimized compliance workflows across large-scale organizational systems

Executive Director (AI + Social Impact Systems), The MIA Foundation 2022 – *current*

- Founded and led the deployment of assistive AI systems supporting individuals with disabilities
- Translated research prototypes into production-ready systems used in educational and care settings
- Built and operationalized partnerships with NYC public schools and clinical organizations

Research Fellow (AI Systems & Policy), Yale University 2021 – 2025

- Co-authored institutional handbook with Office of Academic Affairs, adopted by 14+ academic units
- Bridged technical systems thinking with organizational policy and governance
- Co-designed and taught Yale's first AI course for non-CS majors (400+ students over 3 years)

Assistant Dean for Research & Curriculum Development, Long Island University 2018 – 2020

- Directed research and curriculum strategy across the School for Business, CS, and Information Systems, developing and launching 6 new academic programs

Selected Projects

For recent systems and publications, see rramnauth2220.github.io/

Robots for Autism Therapy

- Deployed 3 large-scale systems (30 robots × 30 homes × 30 days) for fully autonomous in-home therapy
- Built **multimodal perception pipeline** (vision + behavioral state tracking) **robust to real-world variability** (lighting, occlusion, noise)
- Developed a **runtime constraint framework** enforcing behavioral invariants over multi-turn interactions with LLMs
- Designed a **fault-tolerant autonomy stack** with runtime monitoring, watchdog timers, and safe recovery behaviors to support continuous long-term operation without human supervision
- **Scale & impact:** 950+ hours of active therapy; 4.5M+ behavioral events analyzed for in-situ adaptation; clinician-verified gains across all children with autism within just 2 weeks

Robots for School De-Escalation

- Developed socially assistive robots for behavioral de-escalation in K–5 schools
- Built a **state-aware interaction controller** for real-time detection and adaptive intervention selection
- Engineered **hierarchical safety framework** (behavioral → interaction → physical constraints) with human-in-the-loop override
- Designed for **high-noise, partially observable settings** (multi-user, diverse support needs, interruptions)
- **Scale & impact**: month-long deployment; 300+ intervention episodes; improved reintegration into classroom activities vs. baseline methods

Selected Press on Research

- **Tech & Learning Magazine** (Front Cover), *Using AI and Robots To Build Social Connections For All Students,* Apr. 2024 [Link]
- **New York Times**, *How Robots Can Assist Students with Disabilities,* Mar. 2022 [Link]
- **IEEE Pulse**, *AI, Virtual Reality, and Robots Advancing Autism Diagnosis and Therapy,* Nov. 2021 [Link]
- **Yale Daily News**, *Fighting Social Isolation with Robots*, June 2020 [Link]
- **Yale Medical Magazine**, *Treating childhood autism one robot at a time*, Sept. 2019 [Link]

Selected Awards

- **NSF GRFP** and **NASEM Ford** Fellowships (Predoc & Postdoc)
- **Best Paper Awards** (ACM/IEEE HRI 2021, 2022, 2025; IEEE RO-MAN 2025)
- **MIT Rising Stars** in EECS (Electrical Engineering and Computer Science)
- **Yale Best Dissertation Award** (2025); **ACM Outstanding Dissertation Award Nomination**

Education

- **Ph.D.**, Computer Science (AI & Robotics) — Yale University, 2025
- **M.S., M.Phil.**, Computer Science (Cognitive Science) — Yale University, 2023
- **M.S.**, Computer Science (Social Neuroscience & AI) — Yale University, 2021
- **M.S.**, Computer Science — Long Island University, 2018
- **B.S.**, Computer Science (Honors) — Long Island University, 2018