

Isabella Pu

Master's Student @ MIT Media Lab

Personal Robots Group

ipu@media.mit.edu

isabellapu.com

RESEARCH OVERVIEW

My research investigates how humans can work collaboratively with robots and AI to develop novel experiences that spark creativity and curiosity. Specifically, I focus on harnessing the joyful power of these technologies to **encourage creative learning, empower the next generation with technological skills, and explore human-technology artistic co-creation**. By facilitating creative human-robot and human-AI collaboration, I seek to develop new artistic landscapes that humans cannot generate alone. I also have a special interest in ensuring these technologies are *accessible* and *understandable* to all, especially students of historically excluded communities.

EDUCATION

- 2023– **M.S. in Media Arts & Sciences**, Massachusetts Institute of Technology
Expected Graduation: May 2025
Advised by Cynthia Breazeal in the Personal Robots Group
- 2019–23 **B.S.E in Computer Science**, Princeton University, *magna cum laude*
Certificate in **Robots & Intelligent Systems**
Thesis: *A Robotic Generative Percussion Quartet*
Advised by Naomi Leonard, Radhika Nagpal, and Jeffrey Snyder

RESEARCH EXPERIENCE

- 2023– **Interactive Storybook for Early Childhood AI Education**
Advisor: Cynthia Breazeal
Leading a team of engineers, designers, and education specialists to build an interactive storybook that teaches concepts of artificial intelligence (AI) and robotics, particularly in creative contexts, to children in early childhood. Ran pilot study to investigate how children interact with early version of the storybook on tablets. Currently designing and developing activities and minigames as well as the final design of the storybook.
- 2023– **Collaborative Storybook Creation with AI for Elementary School**
Advisor: Cynthia Breazeal
Designed collaborative child-robot storybook creating experience using generative AI. The experience is scaffolded to help children improve their divergent thinking and to encourage more complex stories. Used Unity to develop a tablet app from scratch for children to easily participate in the co-creation experience. Developing robot platform which will act as a friendly writing companion that can both ask questions to help students with their creation *and* answer questions students may have during creation.
- 2023– **Climate Data Exploration & Visualization Curriculum for High School**
Advisor: Cynthia Breazeal
Developing curriculum for high school students (and associated educator guide) to learn how Python—specifically, the Python libraries pandas, matplotlib, and seaborn—can be used to explore and visualize climate data. The curriculum will also include a beginner's guide on using linear regressions and SVMs as predictive models for climate data as well as modules on how to communicate data stories clearly. Curriculum will be piloted in Spring 2024.

- 2023– **Educational Robotics Curricula for Creative AI Education**
Advisor: Cynthia Breazeal
 Working with a team of designers and engineers on development of Doodlebot, a small robot for the classroom. Doodlebot can be easily programmed by students using either drag-and-drop coding blocks or Python to draw different shapes, such as flowers. Doodlebot will be used for currently-in-development curricula that teach K-12 students about how robots and AI can be utilized in creative applications.
- 2023– **Generative AI Tutor Design**
Advisor: Cynthia Breazeal
 Involved in MIT + Axim Collaborative + Georgia State University collaboration on designing a generative AI tutor for college students taking Intro to Computer Science. Designing tutor interactions that prioritize usability and empower student learning, particularly for non-traditional and underrepresented students.
- 2023–24 **Mediating Child Social-Emotional Disclosure to a Social Robot with Art**
Advisors: Rosalind Picard, Cynthia Breazeal, Sharifa Alghowinem
 Designed and developed child-robot interaction with the Jibo social robot platform where child discussion with the robot of their interpretations of artwork acted as a mediating activity for emotional disclosure. Deployed the interaction with eleven children between ages 7 and 11, who showed distinct disclosure patterns when discussing art depicting clear emotions versus neutral landscapes. Currently performing more in-depth analysis of child responses and conversations with the robot.
- 2022–23 **Generating Percussion Music with a Multi-Agent Robotic System**
Advisors: Naomi Leonard, Radhika Nagpal, Jeffrey Snyder
 Designed and developed a robotic percussion quartet using Sphero BOLT robots. Robots performed live by maneuvering through an arena and colliding against frame drums and tambourines along the walls to play coordinated generative percussion music. The “lead” robot selected a percussion phrase informed by contemporary percussion compositions, and “follower” robots chose complementary phrases. Audience members interacted with robots by picking them up, placing them in new areas, adding obstacles to the arena, and playing a MIDI keyboard to change robots’ colors and movements.
 My undergraduate senior thesis work was sponsored by the Princeton School of Engineering and Applied Science and the Princeton Council on Science and Technology.
- 2021–22 **Educational GANs Animation for Vancouver Art Gallery**
Advisor: Adam Finkelstein
 Designed and coded two five-minute animations targeting non-technical audiences, teaching viewers about training GANs and demonstrating it in an easily understandable manner. Trained and optimized GANs to generate handwritten digits and photographs of cat faces to create assets for the animations. Animations displayed in *The Imitation Game* exhibit at the Vancouver Art Gallery from 03/05/2022 - 10/23/2022.

PROFESSIONAL EXPERIENCE

- 2021–23 **Software Engineering Summer Intern**, Blizzard Entertainment (Player Interactions & Trust). Irvine, CA.
 Projects included developing neural networks to predict player churn based on disruptive behavior and building data pipelines for an industry-first positive player behavior analysis platform—implemented in multiplayer online games with millions of players (Overwatch, World of Warcraft)
- 2020–23 **Undergraduate Course Assistant/Grader**, Princeton University. Princeton, NJ.
 Fall 2020: *Introduction to Programming Systems*
 Spring 2021: *Introduction to Machine Learning*
 Fall 2021: *Computer Vision*
 Spring 2022 and 2023: *Economics and Computation*

2016–19 **Kid Code Teacher**, The Westminster Schools. Atlanta, GA.
Taught Scratch and basic Python coding to 2nd through 5th graders at after-school program.

AWARDS AND HONORS

2023 Outstanding Undergraduate Thesis in Computer Science, Princeton University
2023 Sigma Xi Membership (recognizing excellence in research), Princeton University

TEACHING

2023 Guest talk, COS IW Seminar: *Swarm Intelligence: Ants, Bees, Fish, and Humans* (Princeton University)

VOLUNTEERING

2020–23 *President*, Princeton Women in Computer Science. Princeton, NJ.
2020–22 *FIRST Robotics Competition Mentor*, Robbinsville High School. Robbinsville, NJ.