Brandon Yifan Yang

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EDUCATION

○ **University of Pennsylvania** — Philadelphia, PA
M.S.E. in Robotics — *Aug 2025 - May 2027*

○ **University of Virginia** — Charlottesville, VA
B.S. in Computer Science with Highest Distinction (3.9/4.0) — *August 2021 - May 2025*

○ **Relevant Coursework**: Robotics*, GPU Programming & Architecture*, Machine Learning, Reinforcement Learning*, Natural Language Processing*, Probabilistic ML*, Optimization*
*Graduate-level courses.

EXPERIENCE

Embodied Intelligence Research Intern — Beijing, China
Spirit AI — *May 2025 - Aug 2025*

○ Trained and deployed Vision-Language-Action (VLA) model variants in PyTorch on a dual-arm robot, experimenting with contrastive objectives, observation-noise curricula, reduced guidance inputs, and mixture-of-experts (MoE).

○ Designed and implemented DAgger data-collection pipeline for VLA models, including operator-takeover logic and post-training workflows for scaling corrective demonstrations.

○ Integrated robotics simulation environments into a unified, reproducible setup, enabling efficient evaluation of VLA models; containerized training and evaluation workflows with Docker and Slurm. Open-sourced codebase and datasets on GitHub.

RESEARCH EXPERIENCE

General Robotics, Automation, Sensing, and Perception Lab, UPenn — Philadelphia, PA
Advisor: Dinesh Jayaraman, Junyao Shi — *Aug 2025 - Present*

○ Designing retrieval-augmented VLA models for robot manipulation (ongoing, target: RSS 2026).

○ Building scalable data pipeline, training and evaluation infrastructure with Docker, Slurm, JAX, Ray, and Hugging Face on GPU clusters.

Learning and Interactive Robotics, University of Virginia — Charlottesville, VA
Advisor: Yen-Ling Kuo — *Aug 2024 - May 2025*

○ **Interpretable Vision-Language-Action Models via Skill Conditioning**
  * Led *SkillVLA*, a skill-conditioned VLA model for language-conditioned manipulation with improved action interpretability via subgoal instructions and learned skill library.
  * Presented as an oral talk at the 2024 UVA LLM Workshop (slides), earning the Audience Choice Award (top 3 of 28 presentations).

○ **Contrastive Learning for Robot Manipulation**
  * Performed contrastive learning over action sequences to learn behavior-grounded visual embeddings, improving visuomotor policies under heterogeneous camera poses and object appearances. (CoRL 2025)
  * Modified simulation environments and trained PyTorch-based visuomotor policies to evaluate learned embeddings.

Research Assistant, Collaborative Robotics Lab, University of Virginia — Charlottesville, VA
Advisor: Tariq Iqbal — *May 2022 - May 2024*

○ **Grounded Location for Object Manipulation (GLOMA)** [code]
  * Led team of 3 to develop zero-shot image-editing model grounded by language instructions for object relocation and manipulation tasks, designed for downstream robotic applications using goal-conditioned RL and Behavioral Cloning (BC).

* Integrated language grounding with visual perception by using bounding box guidance from pre-trained language models, enabling precise object relocation without external supervision and improving baseline performance by 65%.
  * Collected and annotated custom dataset for fine-tuning pre-trained language and vision models.
  * Presented poster at 3 conferences and symposiums.
- **Centralized multi-agent RL for Collaborative Tasks** [code]
  * Developed long-horizon on/offline centralized MARL for robotic bolt screwing tasks.
  * Designed and optimized custom reward functions in multi-agent framework for task completion and agent collaboration, improving task success rate by 20%.
  * Deployed and tested custom simulated environments in IsaacGym for training and evaluation.

PUBLICATIONS

Lee, Sung-Wook, Xuhui Kang, **Brandon Y. Yang**, and Yen-Ling Kuo. "Class: Contrastive learning via action sequence supervision for robot manipulation."
In *Conference on Robot Learning*, pp. 4743-4766. PMLR, 2025.   [Website][arXiv][PDF]

Sethi, Amish*, **Brandon Y. Yang***, Yuchen Zheng, Jiani Huang, Jianing Qian, Chris Watson, Junyao Shi, Mayur Naik, and Dinesh Jayaraman. "Retrieval-Augmented Vision-Language-Action Model".
Ongoing project.

SOFTWARE PROJECTS

openpi-cuda [GitHub]: Developed custom CUDA kernels via C++/Python bindings to accelerate $\pi_{0.5}$ VLA model inference; achieved 18.5ms latency reduction over baseline PyTorch.

notie-markdown [Website]: Markdown rendering web app with support for equation previewing, graphing, code running, and more. Built with React, TypeScript, Python, Flask. Deployed on Vercel and Heroku.

Blogs and Notes [blog, notes]: Detailed blog posts and course notes with visualizations, graphs, and code on CS and AI topics, written with notie-markdown.

SmartOH [GitHub]: Queue management system designed for office hours. Features real-time queue updates, notifications, and analytics. Built with Next.js, TypeScript, Python, FastAPI. Deployed with CI/CD pipeline on Vercel and AWS EC2.

Voy: Collaborated with 7 non-profits to develop Voy, a volunteer and driver management platform; competed and received $1000 in funding from UVA's Entrepreneurship Cup. Built with React, Node.js, TypeScript, JavaScript.

SKILLS

Programming Languages: Python, C/C++, Java, JavaScript, TypeScript, Coq

ML + Robotics: PyTorch, Jax, CUDA, ROS, HuggingFace, IsaacGym, Habitat, RLBench, Maniskill

Tools & Frameworks: Docker, Slurm, Ray, AWS, Git, CI/CD, React, Next.js