Haoyue (Bill) Xiao

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EDUCATION

Stanford University — **Stanford, CA, USA**
Computer Science, M.S — *Sep 2025 - June 2027*
- ***Related Courses:*** Robot Perception, Self-improving AI Agents, Robot Autonomy

University of California, Berkeley — **Berkeley, CA, USA**
Computer Science, B.A & Applied Mathematics, B.A — *August 2021 - May 2025*
- ***Undergraduate GPA:*** 4.0/4.0 ***(Highest Distinction)***
- ***Honors:*** Dean's List, Phi Beta Kappa *(Selected as Junior)*, Upsilon Phi Epsilon
- ***Related Courses:*** Machine Learning *(Top 1% in Class)*, Computer Vision *(PhD Level Course)*, Algorithms, Probability Theory, Random Process, Convex Optimization, Linear Algebra

SKILLS

Technical Skills: Python, C, SQL, Reinforcement Learning, Computer Vision, Natural Language Processing
Frameworks/Tools: PyTorch, IsaacGym (Legged Gym), OpenCV, Sklearn, Transformer, HuggingFace, Diffusion, Nerf/Gaussian Splatting, Numpy, Nvidia Warp, Wandb, Docker, ROS, Linux

MLE EXPERIENCE

Skild AI | Research Assistant — **San Mateo, CA, USA | April 2025 – Sep 2025**
Quadruped Self-play Chasing/Parkour with One-staged RL — *RL, CV, Distributed Training, Transformer*
- Developed a **one-staged RL pipeline** in **IssacGym** where quadrupeds jointly learn chasing, evasion, and parkour in a **self-play** setting, allowing policies to converge under **fewer artificial shaping rewards** and demonstrate **competing strategies**. The one-stage self-play design aims to **simulate natural evolution** of creatures' survival instincts.
- Designed a **transformer-GRU** estimator, optimized jointly with the actors, to provide global state estimation by fusing multi-view vision with history actions, eliminating the need for two-staged training, distillation, or dagger, and decreasing model complexity by **50%**. Adopted **estimator latent** instead of outputs as actor model input for more stable performance.
- Distributed training on clusters of A6000 GPUs, achieving **8 times** more data sampling and enabling multi-camera perception for end-to-end policy learning. Simulated **depth** raycasting and **LiDAR** using **NVIDIA Warp** for fast raycasting, allowing **5 times faster ray rendering** and customized depth rewards.

Berkeley BAIR Lab | Undergraduate Researcher — **Berkeley, CA, USA | August 2024 - May 2025**
Hexapod Locomotion and Route Planning — *LLM, RL, Sim-to-real*
- Trained hexapod robots using **Proximal Policy Optimization (PPO)** to navigate complex terrains in IssacGym.
- **Fine-tune** reinforcement learning rewards for robust **sim-to-real** transfer, achieving skill success rate of **85%**.
- Designed and implemented a **LLM route planning agent**, using **DsPy** and **LangGraph**, that selects appropriate skills based on environmental challenges, achieving **15% more success** than un-optimized LLM selector in congested household settings.

CMU Robotics Institute | Research Assistant — **Pittsburgh, PA, USA | May 2024 - Dec 2024**
Multisensory Human-to-Robot Imitation with Skill Library — *RL, Multimodal, CV, Transformer, ROS*
- Equipped bimanual robots with **multimodal sensors** *(audio and tactile)*, enabling higher manipulation capability.
- Upgraded **Action Chunking Transformer (ACT)** with multimodal fusion, increasing policy stability by **40%**.
- Built a skill library through high-quality **human demonstrations** and **imitation learning**.

Ai for Good | Research Assistant — **Berkeley, CA, USA | Feb 2024 - Sep 2024**
Development of an Augmented Chatbot Pipeline — *LLM, RAG, Agents, DsPy, FAISS, Docker*
- Built production-ready **RAG** chatbot using **Mistral 7B** model and **FAISS**, augmented from domain-specific articles.
- Adopted **AutoGen**, **DSPy**, **Chain-of-Thoughts**, and other prompt engineering to enhance response stability and validity, delivering high quality anwers on most queries, with success rates of **70% - 80%** and robustness to prompt injection.
- Containerized solution with **Docker** and deployed on **Azure Cloud** with CI/CD pipeline.

SELECTED PROJECTS

Autoregressive Diffusion with Flow Matching
Course Final Project — Jan 2025 – May 2025
- Designed a **transformer-based** chunk-to-chunk **autoregressive flow-matching model**, fusing past chunks to enhance temporal coherence.
- Utilized multiple **data augmentation** and trained model on **VAE latent space**, reducing inference time by **300 %**.
- Deployed and validated on the **QuickDraw!** dataset, generating sketch videos based on text prompts.
- Designed **focal MSE** loss for sparse stroke prediction.

Neural Radiance Fields for 3D Reconstruction
Course Final Project — Dec 2024
- Re-implemented **NeRF** to reconstruct 3D scenes from multi-view images based on the classic paper, using positional encoding, MLPs, and **volume rendering**.
- Optimized ray sampling and hyperparameters, achieving high-quality novel view synthesis on benchmark datasets.