Hanlong Li

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RESEARCH INTERESTS

Robot manipulation learning · Reinforcement & imitation learning · VLA models · Embodiment-aware control

EDUCATION

Institute of Science Tokyo — Tokyo, Japan
M.Eng. in Systems and Control Engineering — *2025 – 2027 (expected)*
Advisor: Prof. Kazuhiro Nakadai

Georgia Institute of Technology — Atlanta, GA, USA
B.S. in Computer Science — *2019 – 2024*
Threads: Intelligence & People · Graduated with High Honor

PUBLICATIONS

Tech. report "AIRoA-0: Long-Horizon, Precise, Cross-Embodiment Manipulation from Handheld Data." Y.-H. Wu, K. Ota, **H. Li**, et al. *AIRoA Technical Report*, 2026. [arXiv] [project] [code]

NAACL 2027 submitted "Paraphrase Consensus Is Not Self-Consistency: Instruction Reliance and Robustness in VLA Policies." **H. Li**, S. Tan, T. Ashizawa, B. Yen, K. Nakadai. *arXiv* 2026; under review at ACL Rolling Review (NAACL 2027 cycle). [arXiv]

CoRL-W "YUBI-STAG: Contact and Semantic-Rich Alignment for VLAs via Automated Video-Language Grounding." M. Tateno, T. Ohkawa, Y.-H. Wu, **H. Li**, T. Matsushima, Y. Sato, K. Ota. *UMI Arena Workshop at CoRL 2026*; accepted, selected for spotlight presentation. [arXiv] [project]

ICRA 2027 submitted "AMBIT: Anticipatory Multimodal Body Recruitment for Bimanual Tracking on a Humanoid." **H. Li**, S. Tan, T. Ashizawa, B. Yen, K. Nakadai. *arXiv* 2026; under review at ICRA 2027. [arXiv]

IROS "The Talking Robot: Distortion-Robust Acoustic Models for Robot–Robot Communication." **H. Li**, K. Kamalahasan, J. Li, K. Nakadai, S. Kousik. *IROS 2026*. [arXiv] [code]

IMECE "Toward Bio-Agentic Visual Communication and Control: Implicit Semantic Manifolds and Invariant State Estimation." B. Starbuck*, **H. Li***, B. Bras. *ASME IMECE 2026*, accepted.

ECCV-W "Spectral Optimal Transport for Dynamics-Aware Sign Language Generation." N. Khan, B. Wu, R. Shi, **H. Li**, B. Yen, C. T. Ishi, K. Nakadai. *ECCV 2026 MoCha Workshop*.

Biomimetics "A Concept for Bio-Agentic Visual Communication: Bridging Swarm Intelligence with Biological Analogues." B. Starbuck†, **H. Li**†, B. Cochran, M. Weissburg, B. Bras. *Biomimetics* 10(9):605, 2025. [DOI]

Patent "Biologically Inspired Active Visual Communication System and Method." B. Bras, M. Weissburg, B. Cochran, **H. Li**, B. Starbuck. U.S. Patent App. US 2026/0127397 A1, 2026. [link]

*Equal contribution. †Corresponding author.

RESEARCH EXPERIENCE

Research Engineer Intern – AIRoA — Tokyo, Japan
Mentors: Nicola Scianca, Yueh-Hua (Kris) Wu — *Aug 2026 – Present*

- **RL execution tracker (initiated & lead).** RL for low-level execution of VLA action chunks: an OpenArm benchmark in MuJoCo/MJLab with PPO, domain randomization and imperfect command streams. Prelim-

inary: **∼2.4% vs. ∼4.6%** tracking error vs. matched PD.

- **Real-time VLA execution.** Designed and hardware-validated asynchronous, time-aligned action-chunk re-inference with interpolated high-frequency control.
- **Real-robot evaluation (lead).** Led **60 sessions (177 trial segments)** on a dual-arm Franka: protocols, metrics, and trajectory recording and analysis tools.
- **Action representation.** Designed and hardware-tested quaternion / rotation-vector poses and observation-relative gripper actions; co-developed hierarchical Goal/Task interfaces.
- **AIRoA-0 (co-author).** Real-robot evaluations on the bimanual Franka (AIRoA technical report, 2026).
- **YUBI-STAG (co-author).** VLA language grounding (UMI Arena Workshop at CoRL 2026; spotlight).

Graduate Researcher – Nakadai Lab Institute of Science Tokyo
Advisor: Prof. Kazuhiro Nakadai *Oct 2025 – Present*

- **AMBIT (first author).** A CVAE proposes whole-body strategies, a non-learned verifier selects, a whole-body QP tracks: **85% vs. 74%** success over a reactive tracker (160 held-out episodes), **0.85 vs. 0.53** on a Unitree G1; runs on a Unitree R1.
- **VLA instruction reliance (first author).** Rewording LIBERO instructions costs base OpenVLA **38.0 pts**; paraphrase consensus does not recover it; paraphrase LoRA post-training: **+2.0 vs. −32.0 pts** for a matched control.
- **Sign language generation (co-author).** Spectral optimal transport for dynamics-aware generation (ECCV 2026 Workshop).

Visiting Researcher – Robot Danger Lab Georgia Tech
Advisor: Prof. Shreyas Kousik *Jun 2024 – Sep 2025*

- **The Talking Robot (first author, IROS 2026).** Co-trained a FastSpeech-style transmitter and Conformer-CTC receiver as a learned acoustic codec for robot–robot messaging: **8.3% CER at 0 dB SNR**, 2.1M parameters, under 13 ms on CPU.
- **Robust training.** Procedural-synthesizer warm start and channel-augmentation curriculum for stable end-to-end training under noise and distortion.

Undergraduate, then Part-time Researcher – SDM Lab Georgia Tech
Advisor: Prof. Bert Bras *Sep 2023 – Aug 2025*

- **Bio-agentic communication.** GenAI/RAG pipeline mapping perceived UAV signals (motion, LEDs) to symbolic responses (Biomimetics 2025, IMECE 2026, U.S. patent application).
- **Visual signaling.** AprilTag signaling with ROS perception and control; a YOLO model extended detection range **5×** at **96%** accuracy.
- **State estimation.** ISM-IEKF benchmark: execution error **10.48 m → 6.37 m** over 200 interception trials.

INDUSTRY EXPERIENCE

Before moving into full-time robotics research, I worked as a full-time software engineer (2024–2025), building full-stack features for AI-powered administrator tools and integrating machine-learning outputs into production web and iOS applications.

TEACHING & HONORS

Teaching Assistant, Global PBL Foundation, Institute of Science Tokyo (2025) · Dean's List, Georgia Tech

SKILLS

Robot learning & control: PyTorch, JAX, PPO/RL, CVAE, QP/IK, ROS 2, MuJoCo/MJLab, Isaac Sim, Gazebo
Programming & systems: Python, C/C++, Java, JavaScript/TypeScript, Linux, Docker, Git, Jetson, OpenCV
Languages: English (bilingual), Mandarin (bilingual), Japanese (basic)