Jeremy Siburian

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Research Interest

To fully integrate autonomous robots into our daily lives, they must be able to perform long-horizon decision-making in complex environments, continuously learn new skills throughout their lifetime, while interacting naturally with humans. To this end, my current research interests revolve around foundation models for decision-making/planning, continual skill learning, and human-robot interaction.

Education

- **The University of Tokyo** *Apr 2025 - Mar 2027 (Expected)*
  Master of Engineering, advised by Yusuke Iwasawa and Yutaka Matsuo Tokyo, Japan
- **Waseda University** *Mar 2025*
  Bachelor of Engineering, advised by Shigeki Sugano Tokyo, Japan

Publications

P1] **Jeremy Siburian***, Keisuke Shirai*, Cristian C. Beltran-Hernandez*, Masashi Hamaya, Michael Görner, Atsushi Hashimoto. **Grounded Vision-Language Interpreter for Integrated Task and Motion Planning**. *CoRL 2025 Workshop on Safe and Robust Robot Learning for Operation in the Real World*. Available: https://arxiv.org/abs/2506.03270. [Project Page]

[P2] **Jeremy Siburian***, Cristian C. Beltran-Hernandez*, Masashi Hamaya. **Integrated Task and Motion Planning for Real-World Cooking Tasks**. *ICRA 2024 Workshop on Cooking Robotics: Perception and Motion Planning*. **Best Video Award** [Demo Video]. Available: https://openreview.net/forum?id=5nGIW3Ixo1

[P3] **Jeremy Siburian**, Alexander Schmitz, Tito Pradhono Tomo, Sophon Somlor, Gang Yan, Satoshi Funabashi, Shigeki Sugano. **Comparative Study of Robotic Slip Detection Algorithms using Distributed 3-Axis Tactile Sensing**. *42nd Annual Conference of the Robotics Society of Japan (RSJ) 2024*.

Research Projects

- **Play with Your Robot: Interactive Learning via Assistance Games** *Nov 2025 - Present*
  mentored by Jiayuan Mao
  - Ongoing research on developing an interactive learning framework to teach robots/agents to solve abstract and complex tasks, such as building LEGO/Minecraft structures. Inspired by Language Games and AssistanceZero.
- **Multimodal Data Retrieval for Augmented Policy Learning** *Jun 2025 - Present*
  advised by Yusuke Iwasawa and Yutaka Matsuo
  - Developed a few-shot imitation learning framework that retrieves past experiences similar to new target tasks data for augmented policy learning of contact-rich tasks, leveraging multimodal tactile sensing and physical compliance.
  - Implemented imitation learning policies (ACT, Diffusion Policy), large behavior models (VLAs), and baseline data retrieval methods such as BehaviorRetrieval, SAILOR, and STRAP applied towards contact-rich tasks.
- **Grounded Vision-Language Interpreter for Integrated Task and Motion Planning [P1]** *Feb - Apr 2025*
  mentored by Masashi Hamaya & Cristian C. Beltran-Hernandez
  - Developed ViLaIn-TAMP, a neuro-symbolic planning framework combining VLMs with integrated TAMP and simulation-based grounded failure reasoning, applied towards real-world cooking & assembly tasks.
- **Integrated Task and Motion Planning for Real-World Cooking Tasks [P2]** *Oct 2023 - Mar 2024*
  mentored by Masashi Hamaya & Cristian C. Beltran-Hernandez
  - Research on solving long-horizon bimanual cooking tasks by combining general TAMP solver (PDDLStream) with multi-stage motion planning (MoveIt Task Constructor), trained slicing skills via deep reinforcement learning.
- **Tactile Sensing for Contact-Rich Manipulation Tasks [P3]** *Apr 2023 - Sep 2024*
  Advised by Shigeki Sugano
  - Researched on various model-based and learning-based slip detection algorithms using tactile sensors for manipulation tasks requiring force control.
  - Developed a robotic bin picking system for assembly line deployment using 3D tactile sensors for force control and slip detection. Managed an R&D budget of 1.5 million yen (Approx. $10k USD).

Skills

- **Programming Languages:** Python, C++, Java, HTML, CSS
- **Robotics Software & Frameworks:** ROS, MoveIt, PDDLStream, PyBullet, MuJoCo, robosuite, IsaacLab
- **Libraries:** Numpy, Matplotlib, Scikit-learn, OpenCV, TensorFlow, Keras, PyTorch
- **Developer Tools:** Git, Git Tools (GitHub, GitKraken, GitLab), Docker, VS Code, PyCharm
- **Robots:** UR5e (Universal Robots), TM5-900 (Techman Robot)