# YONGPENG CAO

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## EDUCATION

**The University of Tokyo, Tokyo, Japan**
**Ph.D.** in Mechanical Engineering/Yamakawa Laboratory *Oct. 2022 - Mar. 2026*
**M.Eng.** in Mechanical Engineering/Yamakawa Laboratory *Sept. 2020 - Sept. 2022*

**Beijing University of Chemical Technology, Beijing, China**
**B.Eng.** in Mechanical Design, Manufacturing and Automation (ME) *Sept. 2016 - Jun. 2020*

## TECHNICAL SKILLS

**Programming:** Python (Proficient, 5 years), C++ (Proficient, 5 years)
**Tools:** **ML:** Torch, W&B, MLflow **Robotics:** OpenCV, ROS1/2, Docker **Dev:** Git, Matlab, LaTeX
**Softwares & Others:** Solidworks, AutoCAD, Keil, IAR. **Robot Arms**: UR5e/UR10e, Franka Panda.

## PROJECTS

**Diffusion Transformer (DiT) for Interaction-Aware Human Reaction Generation** *Oct. 2025 - present*
**Semantic Information-Aware Human Action Recognition for Real-Time Sports Training** *Oct. 2023 - Jun. 2025*
- Extracted sub-action semantics to utilize the semantic information and benefit the human action understanding.
- Enable GCN-based framework to recognize partial actions (up to 25%) for seamless robot assistance.

**Markerless Kendo Motion Prediction Using High-speed Vision System (Master Thesis)** *Dec. 2020 - Sept. 2022*
- Integrated the high-speed vision system and OpenPose to detect and track the human joints in 120 Hz.
- Implemented attack segmentation and attack pattern prediction using LSTM method.

## WORK EXPERIENCE

**Associate Research Fellow**, **IIS, UTokyo, Tokyo, Japan** *Jul. 2026 - Mar. 2027*
**Research Engineer (Permanent)**, **Nablas, Tokyo, Japan** *Jun. 2026 - present*
**Research Engineer (Part-time)**, **Nablas, Tokyo, Japan** *Sept. 2025 - Mar. 2026*
-Time series data processing.
**Intern**, **Hitachi R&D, Tokyo, Japan** *Sept. 2024 - Nov. 2024*
-Implemented caption-based frame aggregation, segmentation, and comparison.
-Achieved zero-shot detection and localization of anomalous actions using VLM. Achieved 62% accuracy.
**Technical Assistant**, **Tokyo University of Science, Tokyo, Japan** *Nov. 2023 - Mar. 2024*
-Achieved stable real-time 3D gaze estimation. Error is under 3 cm in 2.5 m distance.
**Robotics Intern**, **Sony AI, Tokyo, Japan** *Mar. 2023 - Aug. 2023*
-Robot arm benchmarking (UR, Panda), motion planning on ROS1/2.
-Implemented dynamic velocity/linear controller for RL team.
**The University of Tokyo, Tokyo, Japan**
**Research Assistant** Yamakawa Laboratory *Jun. 2024 - Feb. 2025*
-Achieved deformable linear object motion tracking and prediction using FEM + CPD + Bayesian Optimization.
**Technical Assistant** Ishikawa Group Laboratory
-Tobii Eye-tracker based Mobile Assistive Sensors System for People with Disabilities on ROS. *Jun. 2022 - Feb. 2023*

## PUBLICATIONS

- **Yongpeng Cao**, Masahiro Hirano, Hyuno Kim, Yuji Yamakawa: Sub-Action Semantics-Integrated Multi-Modal Fusion for Skeleton-Based Human Action Recognition, ROMAN2026
- Ryo Sakai*, **Yongpeng Cao***, Nobutaka Kimura: Anomalous Frame Detection by Grouping Frame Similarities between Two Videos Computed by Vision-Language Model to Extract Expert Workers' Unique Actions (Under review)
- **Yongpeng Cao***, Shouren Huang*, Sune Lundø Sørensen, Yuji Yamakawa, Masatoshi Ishikawa : A Wearable Real-Time 2D/3D Eye-Gaze Interface to Realize Robot Assistance for Quadriplegics, IEEE Access, (2025)
- Shouren Huang, **Yongpeng Cao**, Kenichi Murakami, Masatoshi Ishikawa, Yuji Yamakawa: Human-Robot Interaction and Collaboration Utilizing Voluntary Bimanual Coordination, SMC2023 Proceedings. (2023)
- **Yongpeng Cao** and Yuji Yamakawa: Marker-less Kendo Motion Prediction Using High-speed Dual-camera System and LSTM Method, AIM2022 Proceedings, pp.159-164 (2022)

## LANGUAGE PROFICIENCY & OTHERS

- **TOEFL**: 101 - **GRE**: 320 (150 + 170) - **JLPT N1**: 122 (pass) - **Mandarin**: Native