RIKU ITSUJI

Master Student at Keio University

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Personal Profile

I am a Master's student in Prof. Hideo Saito's Laboratory at Keio University, where I work on computer vision and machine learning. My research is carried out in collaboration with Prof. Min Xu's Laboratory at Carnegie Mellon University. I am interested in taking computer vision across a wide range of applications, from cryo-EM structural analysis to sports video understanding and social robot navigation. Ultimately, my goal is to create a society where humans and AI collaborate seamlessly in all real-world environments.

Publications

Reconstruction-Aware Cryo-EM Particle Picking

R. Itsuji, *Y. Wang, X. Li, S. Min, H. Saito, M. Xu* — **Under review**, WACV 2027

First-authored submission. Particle picking, contamination removal, and 2D class selection are usually trained and scored in isolation. Running them as one loop, and scoring the loop by the resolution of the map it delivers, beats every picker we compare – and shows that the best 2D F1 is not the best reconstruction.

CryoAnomaly: Few-Shot Cryo-EM Particle Picking via Anomaly-Guided Hard Negative Suppression

R. Itsuji, *R. Otsubo, R. Fujii, X. Li, X. Wu, H. Saito, M. Xu* — **IEEE Access**, 2026

First-authored journal paper. Synthetic micrographs are clean and real ones are not, and that gap is usually what breaks transfer. We turn it into supervision: an anomaly detector trained on the clean synthetic data flags real contaminants, and a hard negative loss suppresses picks that land on them. Best precision, F1, and reconstruction resolution among the methods compared in the 1-shot setting on CryoPPP.

Projects

Benchmarking Social Robot Navigation in the Real World

AI Suitcase, Keio University — In progress, 09/2026 –

Running social navigation policies on a real robot in a busy corridor and asking which metrics track human preference, including whether a vision-language model can stand in for a user study.

Automatic Analysis of Futsal Match Video

Keio University — In progress, 08/2026 –

Player tracking, substitution detection, and set-piece detection from a single fixed camera, built by measuring how far public models from neighbouring sports transfer to an indoor court.

3D Human Pose Estimation in Football Broadcast Video

FIFA Skeletal Tracking Challenge 2026, Keio University — Challenge entry, 2026

Team entry, ninth place. Placing 3D player skeletons in pitch coordinates with a LoRA fine-tuned pose model grounded on the pitch geometry. I owned the fine-tuning loss.

Monocular Depth Estimation in Soccer Broadcast Video

SoccerNet Challenge @ CVPR 2025, Keio University — Challenge entry, 2025

Team entry, fifth place in the monocular depth track. Built on DepthAnything, correcting depth artifacts on player silhouettes and the curvature it hallucinates across the pitch.

Vocabulary Expansion for Japanese Lip Reading

Bachelor's thesis, Keio University — Thesis, 2025

Built a dataset for unseen vocabulary using GAN-based talking-face generation, widening what a Japanese lip-reading model can recognize.

Internships & Work Experience

Research Associate (Full-time)

Carnegie Mellon University, Min Xu Lab, Pittsburgh, PA — 06/2026 – 09/2026

R&D Intern, Edge AI

Sony Semiconductor Solutions, Tokyo 09/2025

Machine Learning Intern
WALC (DMG MORI subsidiary), Tokyo 01/2025 – 04/2026

Education

Master of Science in Information Science
Keio University, Kanagawa 2025 – 2027 (Expected)

Research Lab: Prof. Hideo Saito's Lab. Joint research with Min Xu Lab at Carnegie Mellon University.

Bachelor of Engineering in System Design Engineering
Keio University, Kanagawa 2021 – 2025

Specialized in modeling, analysis, and synthesis of complex systems (Mechanics, Electromagnetism).

Skills & Certifications

Programming: Python, PyTorch, OpenCV, NumPy, Matplotlib
Tools & Platforms: AWS (S3, A2I), Linux, Git, Docker
Domain Software: cryoSPARC, ChimeraX
Certifications: IELTS 6.0, EIKEN Grade Pre-1, Fundamental Information Technology Engineer (IPA), JDLA Deep Learning for GENERAL (G Test)