

# Jumpei Saito

Keio University | 2nd-year Undergraduate | Faculty of Environment and Information Studies  
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## Research Interests

Digital Fabrication, Multi-Robot Systems, Embedded & Wireless Systems, Human-Computer Interaction

# **Education**

**Bachelor (Expected), Faculty of Environment and Information Studies (SFC)** Apr 2024 – Mar 2028 (expected)

Keio University

Major: Computer Science GPA: 3.68 / 4.00

# Publications & Research Outputs

- 1 **Jumpei Saito**, and Koya Narumi. 2024. An Interactive Method for Displaying Images Larger than a Screen Using a Mobile Actuated Display. Poster presentation at the 86th National Convention of IPSJ.
  - 2 **Jumpei Saito**, Ryuki Tsuji, and Tomohiko Iida. 2025. Challenge and Future of Interface Development for Representing Virtual Worlds, following the Overall Championship at RoboCup 2024 OnStage League. Invited talk at the WIDE Camp, March 2025.
  - 3 Rin Ishiguro, **Jumpei Saito**, Takumi Yamamoto, Mayuka Kuwana, and Koya Narumi. 2026. Implementing Deployable and Freeform Balloon Structures with a Single-Stroke Pouch Motor. The 216th IPSJ SIGHCI Technical Report, vol. 2026-HCI-216, no. 29, 7 pages. [Link]
  - 4 Hiroto Horie, Daniel Campos Zamora, Liang He, **Jumpei Saito**, and Koya Narumi. 2026. Implementing a Mobile 3D Printer that can Localize a Printing Position via Natural Language Instruction. The 88th National Convention of IPSJ, 2 pages, to appear in 2026.
  - 5 Kaito Kikuchi, **Jumpei Saito**, Takeo Igarashi, and Koya Narumi. 2026. A Method to Synthesize Worn-Out Fabric Texture with a Physical Image Dataset. The 88th National Convention of IPSJ, 2 pages, to appear in 2026.

# Research Experience

## **Undergraduate Researcher**

*Oct 2025 – Present*

Auto-ID Laboratory, Keio University – Advisor: Jin Mitsugi

## Research on backscatter communication and signal processing.

- Designed and implemented QPSK signal processing for backscatter communication.
  - Implemented modulation/demodulation and evaluated communication performance using MATLAB.

## Technical Staff

Mar 2025 – Present

Programmable Products Lab, Keio University – Advisor: Koya Narumi

Technical support and system implementation for digital fabrication research.

- Implemented hardware, electronics, and control software for a pouch-actuator-based fabrication machine.
  - Developed G-code-driven control software for fabrication workflows.
  - Built research-grade prototypes and data-collection apparatus for digital fabrication studies.

## **Research Mentee**

Apr 2023 – Mar 2024

Experts in Information Science Program, National Institute of Informatics (NII)

– Advisor: Koya Narumi

Research on interactive display systems using autonomous mobile robots.

- Investigated methods for presenting images larger than physical screens through autonomous moving displays.
- Presented research outcomes through poster and oral sessions; awarded Best Presentation / Poster Award.

## Projects

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### RoboCup OnStage Team “Tomoshibi Technology”

*Apr 2023 – Present*

Team Leader & Founder

Development of interactive multi-robot systems integrating mobility, actuation, and visual expression.

- Founded and led a robotics team from scratch, mentoring members with no prior robotics experience.
- Designed and implemented interactive systems, including mobile displays and illuminated actuated mechanisms.
- Built and deployed a coordinated system of up to 15 robots; won championship titles at national and international RoboCup OnStage competitions.

## Technical Skills

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### Software

- C/C++, Python, Verilog, MATLAB, Linux, Git
- Embedded software (motor control, timing-critical control, inter-MCU communication)
- HAL-based MCU and FPGA programming for communication (STM32, ESP32, Gowin Tang series)

### Hardware

- 3D printing (Ender-3, Guider 2S, Bambu Lab printers), CNC machining (KitMill CL200), Laser cutting
- Mechanical design using Autodesk Fusion, and Schematic and PCB design using KiCad

## Awards

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- 2024 — RoboCup Eindhoven 2024 OnStage League: **Individual Team 1st Place**  
International performance-robotics competition; won 1st place among 24 invited teams from around the world.
- 2024 — RoboCupJunior Japan Open 2024 OnStage League: **Champion & Presentation Award**  
Won the championship after six consecutive years of participation; qualified for the world championship.
- 2024 — Experts in Information Science Program (NII): **Best Poster Presentation Award**  
Received the program's top award among 40 selected students in NII's research mentorship program.
- 2025 — Keio University Shonan Fujisawa Campus (SFC): **SFC STUDENT AWARD**  
Faculty-wide award; first-year undergraduate recipient in 9-years.

## Fellowships & Grants

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- 2022 – Present — Masason Foundation Fellow: **Full Scholarship**  
One of 30 global fellows selected by Masayoshi Son (SoftBank Group) received cumulative funding exceeding JPY 10,000,000 for education and independent research.
- 2023 — MITOU Junior Program: **Selected Creator**  
One of 20 under-18 participants nationwide; awarded a JPY 500,000 scholarship to develop a custom 3D-printed motor with mentorship.

## Leadership & Outreach

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- Successfully crowdfunded JPY 3,055,000 from 168 supporters to cover travel costs for the RoboCup Eindhoven 2024 competition.
- Founded and organized a student robotics and hardware expo in Japan (Kanto region), connecting student developers and companies (scheduled for Feb 2026; JPY 1,000,000 funding; 50+ participants).