

# SIHAN TAN

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## RESEARCH INTEREST

My research interest lies in **Multimodal Understanding and Generation**, with a focus on **vision and language modeling** in real-world communication. I explore how modalities such as vision, speech, and text can be effectively aligned to support natural and accessible human-computer interaction.

As a representative challenge, I am currently working on **Sign Language Understanding**, where the input consists of fine-grained visual gestures and the output is semantic spoken text. This task not only requires temporal and cross-modal modeling but also reflects my broader goal: to develop **inclusive AI** that supports diverse human expression and enables more **accessible communication**.

**Fields:** Natural Language Processing, Computer Vision, Multimodal, Machine Learning

**Topics:** Sign Language Understanding, Multilingual Machine Translation (MT), Efficient MT Training

## PROFESSIONAL EXPERIENCE

### University of Zurich

Zurich, Switzerland

Visiting Researcher

08/2025 - Present

- Visit Language, Technology and Accessibility Group under Prof. Sarah Ebling

### Institute of Science Tokyo

Tokyo, Japan

Research Assistant

09/2023 - Present

- Lead Sign Language Processing team and deploy system for real-life sign language-based HRI
- Mentor master's, bachelor's, and exchange students

Research Student (formerly Tokyo Tech)

10/2021 - 03/2022

- Non-degree program for Research
- worked on speech recognition using ESPnet

### NHK Science and Technology Research Laboratories

Tokyo, Japan

Visiting Researcher

04/2024 - Present

- Work with NHK Sign Language Team
- Focus on multilingual translation, efficient training for low-resource sign language

Intern

08/2023 - 03/2024

- Worked on Sign Language Translation under Taro Miyazaki
- Boosted Lab-level collaboration

### Dalian University of Technology

Dalian, China

Research Assistant

12/2019 - 06/2022

- Worked on WiFi signal-based Human Action Recognition via cross-modal

## EDUCATION

### Institute of Science Tokyo (Formerly Tokyo Tech)

Tokyo, Japan

Ph.D. in Systems and Control Engineering

04/2024 - EST. 03/2027

Advisor: Prof. Kazuhiro Nakadai

M.E. in Systems and Control Engineering, *Best Graduate*

03/2022 - 03/2024

Advisor: Prof. Kazuhiro Nakadai, Prof. Katsutoshi Itoyama

### Dalian University of Technology

Dalian, China

B.E. in Digital Media Technology, *Outstanding Bachelor's Graduate*

09/2017 - 07/2021

Advisor: Xin Fan

PUBLICATION

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Journal

[9] **A Review of Deep Learning-based Approaches to Sign Language Processing**  
Sihan Tan, Nabeela Khan, Zhaoyi An, Yoshitaka Ando, Rei Kawakami, Kazuhiro Nakadai  
*Advanced Robotics*, 2024, December, 1–19.

[8] **Advancing Human-Computer Interaction: End-to-End Sign Language Translation**  
Sihan Tan, Katsutoshi Itoyama, Kazuhiro Nakadai  
*The Transactions of Human Interface Society*, 2024 Volume 26 Issue 4 Pages 391-398.

[7] **Motion Inbetweening Based on Body Parts Integration for Sign Language Generation**  
Nabeela Khan, Sihan Tan, Katsutoshi Itoyama, Kazuhiro Nakadai  
*The Transactions of Human Interface Society*, 2024 Volume 26 Issue 4 Pages 431-442.

Conference

[6] **Towards Online Sign Language Expression for Real-Time Human-Robot Interaction**  
Nabeela Khan, Sihan Tan, Kazuhiro Nakadai  
In *Proceedings of the 34th IEEE International Conference on Robot and Human Interactive Communication (RO-MAN)*, 2025.

[5] **Multilingual Gloss-free Sign Language Translation: Towards Building a Sign Language Foundation Model**  
Sihan Tan, Taro Miyazaki, Kazuhiro Nakadai.  
In *Proceedings of the 63rd Annual Meeting of the Association for Computational Linguistics (ACL)*, 2025.

[4] **Improvement in Sign Language Translation Using Text CTC Alignment**  
Sihan Tan, Taro Miyazaki, Nabeela Khan, Kazuhiro Nakadai.  
In *Proceedings of the 31st International Conference on Computational Linguistics (COLING)*, 2025.

[3] **Improving Sign Language Understanding Introducing Label Smoothing**  
Sihan Tan, Nabeela Khan, Katsutoshi Itoyama, Kazuhiro Nakadai  
In *Proceedings of the 32nd IEEE International Conference on Robot and Human Interactive Communication (RO-MAN)*, 2023.

Workshop

[2] **SEDA: Simple and Effective Data Augmentation for Sign Language Understanding**  
Sihan Tan, Taro Miyazaki, Katsutoshi Itoyama, Kazuhiro Nakadai.  
In *Proceedings of the LREC-COLING 11th Workshop on the Representation and Processing of Sign Languages (sign-lang)*, 2024.

[1] **Sign Language Translation with Gloss Pair Encoding**  
Taro Miyazaki, Sihan Tan, Tsubasa Uchida, and Hiroyuki Kaneko  
In *Proceedings of the LREC-COLING 11th Workshop on the Representation and Processing of Sign Languages (sign-lang)*, 2024.

GRANTS

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<b>Heyning-Roelli Foundation Scholarship</b> Research Fund, stipend Publisher: Heyning-Roelli Foundation	08/2025 - 01/2026
<b>Global Off-Campus Project</b> Research Fund, stipend Publisher: Academy of Super Smart Society, Science Tokyo	08/2025 - 01/2026
<b>Academy of Super Smart Society Scholarship</b> Stipend Publisher: Academy of Super Smart Society, Science Tokyo	06/2023 - present
<b>Tsubame Scholarship</b> Stipend Publisher: Academy of Super Smart Society, Science Tokyo	04/2024 -present

## AWARDS

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- Miura Award**, The Japan Society of Mechanical Engineers. 03/2024  
Given to the most outstanding graduate student in the department.
- Department Prize for Outstanding Paper Presentation**, Tokyo Institute of Technology. 03/2024  
Awarded for master's thesis presentation.

## Misc.

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### Professional Service

- **Peer Review:** ROMAN (2023, 2025)
- **Journal Reviewer:** IEEE Access

### Mentoring

- **Master's student:** Continuous Sign Language Recognition
- **Bachelor's student:** Customized Sign Language Translation
- **Exchange student:** Online Sign Language Processing System

## SKILLS

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**Languages:** Mandarin (Native), English (Fluent), Japanese (Fluent), German (Basic)

**Coding:** Python, PyTorch, TensorFlow, Linux, Matlab, C, C++, SQL,  $\text{\LaTeX}$ , ...