SOSUKE ICHIHASHI

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RESEARCH INTEREST

I create new media to gain insights into how people perceive and engage with the world. He approaches this in a variety of ways, going back to debates in philosophy, the arts, media theory and computer science in its early days, as well as augmenting human perception by considering human perceptual and bodily mechanisms.

EDUCATION

Ph.D. in Digital Media (GPA: 4.00/4.00)   August 2022 - June 2026 (Anticipated)
Georgia Institute of Technology
Advisor: Dr. Noura Howell

Master of Arts and Sciences in Information Studies (GPA: 3.97/4.00)   April 2020 - March 2022
The University of Tokyo
Information Somatics Lab (Advisor: Dr. Masahiko Inami)

Exchange in Electrical and Computer Engineering (University Honors)   August 2018 - May 2019
The University of Texas at Austin

Bachelor of Engineering, Global Engineering   April 2016 - March 2020
Kyoto University
Innovative Disaster Prevention Technology and Policy Research Lab (Advisor: Dr. Takahiro Sayama)

CONFERENCE PUBLICATIONS & PRESENTATIONS

1. **Sosuke Ichihashi**, Masahiko Inami and Noura Howell. *Fast-Switching, Spatial Thermal Display Using Water and Visible Lights.* In Smell, Taste, and Temperature Interfaces Workshop at CHI 2023. 2023. Workshop Paper and Demo.

2. **Sosuke Ichihashi**, Arata Horie, Masaharu Hirose, Zendai Kashino, Shigeo Yoshida, Sohei Wakisaka and Masahiko Inami. *ThermoBlinds: Non-Contact, Highly Responsive Thermal Feedback for Thermal Interaction.* In Special Interest Group on Computer Graphics and Interactive Techniques Conference Emerging Technologies (SIGGRAPH '22 Emerging Technologies). 2022. Peer Reviewed Publication.

3. **Sosuke Ichihashi**, Arata Horie, Zendai Kashino, Shigeo Yoshida, and Masahiko Inami. *Effects of Thermal Presentation According to the Other's Gaze in Remote Communication .* International Symposium on Measurement and Control in Robotics 2021 (ISMCR '21). 2021. Presentation.

4. **Sosuke Ichihashi**, Arata Horie, Masaharu Hirose, Zendai Kashino, Shigeo Yoshida, and Masahiko Inami. *High-Speed Non-Contact Thermal Display Using Infrared Rays and Shutter Mechanism.* In Adjunct Proceedings of the 2021 ACM International Joint Conference on Pervasive and Ubiquitous Computing and Proceedings of the 2021 ACM International Symposium on Wearable Computers (UbiComp-ISWC '21 Adjunct). 2021. The First Workshop on Multiple Input Modalities and Sensations for VR/AR Interactions (MIMSVAI '21) **Best Paper Award**. Peer Reviewed Publication.

5. **Sosuke Ichihashi**, Arata Horie, Zendai Kashino, Shigeo Yoshida, and Masahiko Inami. *The effect of temperature presentation according to the gaze of others on remote communications.* The 26th Annual Conference of Virtual Reality Society of Japan. 2021. Publication in Japanese.

6. **Sosuke Ichihashi**, Arata Horie, Zendai Kashino, Shigeo Yoshida, and Masahiko Inami. *Rapid Thermal Presentation by Controlling Infrared Irradiance using a Shutter Mechanism.* Information Processing Society of Japan Entertainment Computing 2021. 2021. Publication in Japanese.

7. **Sosuke Ichihashi**, Arata Horie, Hiroto Saito, Zendai Kashino, and Masahiko Inami. *Preliminary Study on Orientation Perception with Far Infrared Stimulus.* The Society of Instrument and Control Engineering System Integration Division Conference. 2020. Publication in Japanese.

EXHIBITION & DEMONSTRATION

Smell, Taste, and Temperature Interfaces Workshop at CHI 2023   April 2023
Fast-Switching, Spatial Thermal Display Using Water and Visible Lights

Georgia Tech Digital Media Demo Day 2023   April 2023
Synesthetic Thermal Painting Experience Using Color-Detecting Brush and Fast-Switching, Non-contact Thermal Display

Guthman Music, Art, and Technology Fair   February 2023
Heat-O-Phone: Stereo Thermal Music Experience Using Fast-Switching, Non-contact Thermal Displays

SIGGRAPH 2022 Emerging Technologies   August 2022
ThermoBlinds: Non-Contact, Highly Responsive Thermal Feedback for Thermal Interaction

RESEARCH & WORK EXPERIENCE

Research Intern   May 2023 - Aug 2023
OMRON SINIC X

Developed an interactive tabletop swarm robot system (both VR simulator and real robots) and identified design parameters. Developed the embodied swarm robot controlling algorithms and got a patent on them. Developed a research question, designed psychophysical experiments, conducted them, analyzed the results, and submitted the full-paper to CHI 2024 (under review). Mentored by Dr. Shigeo Yoshida (https://shigeodayo.me/), Dr. Mai Nishimura (https://denkiwakame.github.io/), and Dr. Kazutoshi Tanaka (https://kazutoshi-tanaka.github.io/pages/index_eng.html).

Graduate Research Assistant   August 2022 - May 2023
Future Feelings Lab, Georgia Institute of Technology

Developed a fast-switching, non-contact thermal feedback method using visible lights and water, conducted the preliminary psychophysical experiment, and presented the result and demonstrated the device at Smell, Taste, and Temperature Interfaces Workshop at CHI 2023.

Master's Student   April 2020 - March 2022
Information Somatics Lab, The University of Tokyo

Developed a fast-switching, non-contact thermal feedback method using infrared rays and a shutter mechanism, conducted quantitative and qualitative evaluations, examined its applications (UbiComp 2021 MIMSVAI and SIGGRAPH 2022 Emerging Technologies).

Undergraduate Research   April 2019 - March 2020
Innovative Disaster Prevention Technology and Policy Research Lab, Kyoto University

Optimized a rainfall-runoff-inundation model for 120 rivers in Japan with combinatorial optimization.

HONORS & AWARDS

CDAIT Student IoT Innovation Capacity Building Challenge 2023 ($5,500)   January - May 2023

INOAC International Education and Scholarship Foundation ($18,888)   August 2022 - July 2024

JST SPRING GX Research Grant ($3,000) Development of Gaze Interaction With Two-Dimensional Thermal Feedback and Establishment of Its Design Theory   April - September 2022

MIMSVAI Best Paper Award   in UbiComp-ISWC '21 Adjunct   2021

SICE SI Haptics Committee Research Grant ($500) Five research proposals were awarded. 2021

Kyoto University Civil Engineering Society Funds ($4,000)   2017, 2019

Japan Student Services Organization Overseas Study Scholarship ($7,500)   2018 - 2019

TECHNICAL STRENGTHS

Hardware Prototyping	Arduino[1], Raspberry Pi[2], Fusion 360[1], 3D printing[1], Laser cutting[1]
Software Prototyping	Unity (VR & Robot Control)[1], p5.js[1] ROS[2] Processing[2], TouchDesigner[2]
Programming Language	Python[1], C#[1], Fortran[1], MATLAB[2], C[2], C++[2], Java[2], JavaScript[2]
Others	ArcGIS[1], AutoCAD[1], Biosensing[2], Eye Tracking[1], Revit[2], Tiled[1]

TEACHING & MENTORING

Mentor for undergraduate students   January - May 2023
Future Feelings Lab, Georgia Institute of Technology

Formed a team for the CDAIT Student IoT Innovation Capacity Building Challenge 2023 with two undergrad students from computing and mechanical engineering majors and won the grant. After reviewing previous studies on thermal interaction, we developed Heat-O-Phone, thermal music experience where non-contact, fast-switching heat is provided according to the musics and demonstrated at the Guthman Music, Art, and Technology Fair as well as Digital Media Demo Day.

Arduino workshop lecturer   March 2023
Georgia State University

Had a guest lecture on Introduction to Arduino as part of a graduate level course at Georgia State University. Taught basic Arduino coding, digital and analog inputs/outputs, and circuits in a hands-on workshop format.

Mentor for an undergraduate student   November 2020 - March 2021
Information Somatics Lab, The University of Tokyo

Discussed the design of a haptic device that provides various rotational skin stretch distributions on the forearm and guided the hardware development as well as a psychophysical evaluation. He joined Dr. Hiroyuki Shinoda's lab as a master's student and is continuing his study on haptics.

REFERENCES

Noura Howell
Assistant Professor, The School of Literature, Media, Communication, Georgia Institute of Technology
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Masahiko Inami
Professor, Research Center for Advanced Science and Technology, The University of Tokyo
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Yasuaki Monnai
Associate Professor, Research Center for Advanced Science and Technology, The University of Tokyo
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[1] Excellent   [2] Strong