

Sosuke Ichihashi

PhD Candidate at Georgia Institute of Technology

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Research: systems augmenting human perceptions

I create systems that **augment human perceptions**. I believe augmented perceptions will bring a new paradigm of interactions in both physical and digital worlds, and I **explore the interactions between augmented people and the physical / digital world**. Although HCI researchers have enabled various interactions, they were designed for innate perceptions. Augmented perceptions eliminate the constraints coming from limited modes and capabilities of innate perceptions.

One such example is RattleEye, which enables people to feel the temperature of objects they see. Real-time thermal feedback is provided based on user gaze. Users feel the warmth of coffee and coolness of coke on a table just by looking at them. **The experiences are so intuitive and natural that users feel like their visions are augmented** rather than they are interacting with thermal interfaces. RattleEye eliminates the need for touch and limited spatial acuity of innate thermal perception from people's interactions.

As the foundation for augmented perception systems, my work include various display technologies, such as **thermal, olfactory, texture fabrication, and swarm robots**. Creating and evaluating augmented perceptions also **contributes new insights on human perceptual system as well as the world shaping it in an abductive manner**.

Education

'22– **Ph.D. Candidate (Digital Media) at Georgia Institute of Technology**
Advisor: **Prof. Noura Howell**

2022 **MS (Interdisciplinary Info. Studies) at The University of Tokyo**
Advisor: **Prof. Masahiko Inami**

2020 BE (Global Eng.) at Kyoto University
Advisor: Prof. Takahiro Sayama

2019 Exchange (Elec. & Comp. Eng.) at The University of Texas at Austin

Publications

- 8 Hydroptical Thermal Feedback: Spatial Thermal Feedback Using Visible Lights and Water
📺 [watch video](#)
Sosuke Ichihashi, Masahiko Inami, Hsin-Ni Ho, Noura Howell
In Proc. UIST '24 (to appear)
- 7 Swarm Body: Embodied Swarm Robots 📺 [watch video](#)
Sosuke Ichihashi, So Kuroki, Mai Nishimura, Kazumi Kasaura, Takefumi Hiraki, Kazutoshi Tanaka, Shigeo Yoshida
In Proc. CHI '24
Popular Choice Honorable Mention Award
- 6 ThermoBlinds: Non-Contact, Highly-Responsive Thermal Feedback for Thermal Interaction 📺 [watch video](#)
Sosuke Ichihashi, Arata Horie, Masaharu Hirose, Zendai Kashino, Shigeo Yoshida, Sohei Wakisaka, Masahiko Inami
In Proc. SIGGRAPH '22 Emerging Technologies
- 5 High-Speed Non-Contact Thermal Display Using Infrared Rays and Shutter Mechanism
Sosuke Ichihashi, Arata Horie, Masaharu Hirose, Zendai Kashino, Shigeo Yoshida, Masahiko Inami
In Proc. UbiComp-ISWC '21 Adjunct MIMSVAI '21
MIMSVAI Best Paper Award
- 4 Effects of Thermal Presentation According to the Other's Gaze in Remote Communication
Sosuke Ichihashi, Arata Horie, Zendai Kashino, Shigeo Yoshida, Masahiko Inami

Presentation in ISMCR '21

- 3 The effect of temperature presentation according to the gaze of others on remote communications
Sosuke Ichihashi, Arata Horie, Zendai Kashino, Shigeo Yoshida, and Masahiko Inami
In Proc. VRSJ '21 Publication in Japanese
- 2 Rapid Thermal Presentation by Controlling Infrared Irradiance using a Shutter Mechanism
Sosuke Ichihashi, Arata Horie, Zendai Kashino, Shigeo Yoshida, Masahiko Inami
In Proc. IPSJ EC '21 Publication in Japanese
- 1 Preliminary Study on Orientation Perception with Far Infrared Stimulus
Sosuke Ichihashi, Arata Horie, Hiroto Saito, Zendai Kashino, Masahiko Inami
In Proc. SICE SI '20 Publication in Japanese

Exhibit & Demo

5	Swarm Body	CHI '24	2024
4	Hydroptical Thermal Display	STT Workshop (CHI '23)	2023
3	Thermal Painting	Georgia Tech DM Demo Day '23	2023
2	Heat-O-Phone	Guthman Fair '23	2023
1	ThermoBlinds	SIGGRAPH '22 E-Tech	2022

Research Experience

2024.07 – 2024.08	Ho Haptics Lab @ Kyushu University Research Intern advised by Prof. Hsin-Ni Ho	Fukuoka, Japan
2023.08 – 2024.02	Code Craft Lab @ Georgia Institute of Technology Independent Study advised by Prof. HyunJoo Oh	Atlanta, USA
2023.05 – 2023.08	Interaction Group @ Omron Sinic X Research Intern advised by Dr. Shigeo Yoshida	Tokyo, Japan

Funding

8	\$2k	Japan Health & Research Institute Research Fund	2024
7	\$5k	CDAIT Student IoT Innovation Capacity Building Challenge	2023
6	\$20k	INOAC International Education Scholarship	2022
5	\$3k	JST SPRING GX Research Grant	2022
4	\$0.5k	SICE SI Haptics Committee Research Grant	2021
3	\$2k	Kyoto University Civil Engineering Society Fund	2019
2	\$7.5k	Japan Student Services Organization Overseas Study Scholarship	2018
1	\$2k	Kyoto University Civil Engineering Society Funds	2017

Selected Awards

3	CHI Interactivity Popular Choice Honorable Mention Award	2024
2	CDAIT IoT Innovation Capacity Building Challenge Honorable Mention	2023
1	MIMSVAI Best Paper Award	2022

Mentoring

4	Adam M Vaughn (ECE undergrad at Georgia Tech)	2024
3	Luke X Wang (CS undergrad at Georgia Tech)	2022
2	Chang Ye Huang (ME undergrad at Georgia Tech)	2022
1	Sora Satake (MIEP undergrad at UTokyo. Now: Master at UTokyo)	2020

Teaching

7	TA: LMC 2700 Intro to Computational Media	Georgia Tech, USA	2024
6	Lecturer: LMC 2400 Intro to Media Studies	Georgia Tech, USA	2024
5	TA: LMC 6313 Principle of Interaction Design	Georgia Tech, USA	2023
5	Instructor: Arduino Workshop	GSU, USA	2022
4	Instructor: JSPS Science Dialogue	Akashi Kita HS, Japan.	2018
3	Instructor: Japanese History	JHP ES, Macedonia	2018
2	Instructor: KU Disaster Prevention School	Five ES's, Indonesia	2017
1	TA: Eng. Sci. Global Communication Program	Ngee Ann Poly, Singapore	2017

References

1. Noura Howell (PhD Advisor)

Assistant Professor, Georgia Tech

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2. Masahiko Inami

Professor, University of Tokyo

🌐 [website](#)

3. Shigeo Yoshida

Principal Investigator, Omron Sinic X

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4. Hsin-Ni Ho

Associate Professor, Kyushu University

🌐 [website](#)