

Shaoyu Cai

Updated February 27, 2022

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Person Webpage: <https://shaoyuca.github.io/mypage/>

Citizenship: China

Research interests

Human-Computer Interaction, Tactile Modeling and Rendering, Cross-modal Learning, Haptic Interface, Virtual & Augmented Reality

Education

City University of Hong Kong

Hong Kong SAR, China

Doctor of Philosophy

09/2019 – Present

Supervisor: Prof. Kening Zhu

Huazhong Agricultural University

Wuhan, China

Bachelor of Engineering

09/2014 – 06/2018

Thesis: Designing of Automatic Flatness Detection System Based on PLC

Publications

[j3] **GAN-based image-to-friction generation for tactile simulation of fabric material**

Shaoyu Cai, Lu Zhao, Yuki Ban, Takuji Narumi, Yue Liu and Kening Zhu.

In Computers & Graphics, vol. 102, pp. 460-473, Feb. 2022.

[c6] **Weighted Walking: Propeller-based On-leg Force Simulation of Walking in Fluid Materials in VR**

Pingchuan Ke, **Shaoyu Cai**, Lantian Xu, Kening Zhu.

In SIGGRAPH Asia 2021 Emerging Technologies (SA '21 Emerging Technologies). ACM, New York, NY, USA, Article 19, pp. 1–2. 2021.

[j2] **Visual-Tactile Cross-Modal Data Generation using Residue-Fusion GAN with Feature-Matching and Perceptual Losses**

Shaoyu Cai, Kening Zhu, Yuki Ban, and Takuji Narumi.

In IEEE Robotics and Automation Letters (RA-L), vol. 6, no. 4, pp. 7525-7532. with *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2021)*.

[c5] **FrictGAN: Frictional Signal Generation from Fabric Texture Images using Generative Adversarial Network**

Shaoyu Cai, Yuki Ban, Takuji Narumi, and Kening Zhu.

In ICAT-EGVE 2020: International Conference on Artificial Reality and Telexistence & Eurographics Symposium on Virtual Environments, pp. 11-15. The Eurographics Association, 2020. (**Best Paper Audience Choice Award**)

[c4] **ThermAirGlove: A pneumatic glove for thermal perception and material identification in virtual reality**

Shaoyu Cai, Pingchuan Ke, Takuji Narumi, and Kening Zhu.

In 2020 IEEE Conference on Virtual Reality and 3D User Interfaces (VR), pp. 248-257. IEEE VR, 2020. (Acceptance Rate = 21.4%)

[c3] **Demonstration of thermairglove: A pneumatic glove for material perception in virtual reality through thermal and force feedback**

Shaoyu Cai, Pingchuan Ke, Shanshan Jiang, Takuji Narumi, and Kening Zhu.
In SIGGRAPH Asia 2019 Emerging Technologies, pp. 11-12. 2019. (Acceptance Rate = 20%)

[j1] **A sense of ice and fire: Exploring thermal feedback with multiple thermoelectric-cooling elements on a smart ring**

Kening Zhu, Simon Perrault, Taizhou Chen, **Shaoyu Cai**, and Roshan Lalintha Peiris.

International Journal of Human-Computer Studies 130 (2019): 234-247.

[c2] **Embodied Weather: Promoting Public Understanding of Extreme Weather Through Immersive Multi-Sensory Virtual Reality**

Pingchuan Ke, Kai-Ning Keng, Shanshan Jiang, **Shaoyu Cai**, Zhiyi Rong, and Kening Zhu.

In The 17th International Conference on Virtual-Reality Continuum and its Applications in Industry, pp. 1-2. 2019.

[c1] **HapTwist: creating interactive haptic proxies in virtual reality using low-cost twistable artefacts**

Kening Zhu, Taizhou Chen, **Shaoyu Cai**, Feng Han, and Yi-Shiun Wu.

In SIGGRAPH Asia 2018 Virtual & Augmented Reality, pp. 1-2. 2018.

Research experience

The University of Tokyo

Tokyo, Japan

Graduate School of Information Science and Technology Visiting Researcher

Cyber Interface Lab

01/2020 – 03/2020

Mentors: Prof. Takuji Narumi and Prof. Yuki Ban

City University of Hong Kong

Hong Kong SAR, China

School of Creative Media

Research Assistant

Multimodal and Embodied Interaction (MEI) Lab

09/2018 – 08/2019

Mentor: Prof. Kening Zhu

National Taipei University

Taiwan, China

Department of Electrical Engineering

Exchanging Student

Artificial Intelligence & Robotics Technology Lab

09/2016 – 01/2017

Mentor: Prof. Hooman Samani

Teaching experience

SM1103A: Introduction to Media Computing

Teaching Assistant

	Lecturers: Mike Wong, Daniel Howe, Dick Thung Teaching basic programming of p5.js	Fall 2020 & 2021
	SM2715: Creative Coding Lecturers: Mike Wong, Manfred Lau, Ryan Lam Teaching basic programming of Processing	Teaching Assistant Spring 2021
Talks and Demos	SCM/ACIM Research Colloquium Talk: Deep Cross-modal Visual-Tactile Generation	02/2022 CityU
	ACM SIGGRAPH Asia 2021 <i>Weighted Walking</i> Demonstration	12/2021 Online
	IROS 2021 <i>Visual-Tactile Data Generation</i> Oral Presentation	09/2021 Online
	Seeing in the Dark: Hong Kong Harbour and Lighthouses <i>Embodied Weather</i> Demonstration	05/2021 Hong Kong Maritime Museum
	ICAT-EGVE 2020 <i>FrictGAN</i> Oral Presentation	12/2020 Online
	The Night of IEEE VR, China VR 2020 workshop IEEE VR 2020 Workshop	09/2020 Online
	IEEE Virtual Reality 2020 <i>ThermAirGlove</i> Oral Presentation	03/2020 Online
	ACM SIGGRAPH Asia 2019 <i>ThermAirGlove</i> Demo & Presentation	11/2019 Brisbane, Australia
	ACM SIGGRAPH VRCAI 2019 <i>Embodied Weather</i> Demo	11/2019 Brisbane, Australia
	ACM SIGGRAPH Asia 2018 <i>Haptwist</i> Demo	12/2018 Tokyo, Japan
Honors	Best Paper Audience Choice Award (Top 3) Special Thanks for Speakers Special Recognitions for Outstanding Reviews Research Tuition Scholarship 2020/21 (Amount: 42096 HKD) Outstanding Reviewers Outstanding Graduates (Top 10)	ICAT-EGVE 2020 China VR 2020 CHI 2020 & 2022 CityU MobileHCI 2020 HZAU

Skills

Programming

Proficient in: Python, TensorFlow, PyTorch, Keras, MATLAB.

Familiar with: C, JavaScript, HTML.

Prototyping

Proficient in: Arduino, Processing, 3D Printing & Laser cutting.

Familiar with: AutoCAD, PCB, Circuit design.

Languages

Mandarin Chinese (Native), English (Fluent), Cantonese (Competent), Japanese (Basic).

Service and outreach

Paper Reviewing

CHI 2020 (Special Recognitions) & 2021 & 2022 (Special Recognitions) Papers

ISS 2021 (ACM PAMHCI Journal)

VRST 2020 & 2021 Papers

ICMI 2021 Papers

ISMAR 2021 Posters

UbiComp/ISWC 2021 Posters and Demos

MobileHCI 2020 Papers (Special Recognitions)

SIGGRAPH Asia 2019 & 2020 & 2021 Emerging Technologies

CHI 2019 Late-Breaking Work

Committee Member

CHI 2020 & 2021 Late-Breaking Work

Memberships

ACM student member

2019.10-present

References

Prof. Kening Zhu

PhD supervisor

Associate Professor at the School of Creative Media & Department of Computer Science, City University of Hong Kong

Email: keninzhu@cityu.edu.hk

Prof. Takuji Narumi

Research supervisor

Associate Professor at the Graduate School of Information Science and Technology, The University of Tokyo

Email: narumi@cyber.t.u-tokyo.ac.jp