

# Shaoyu Cai

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

Citizenship: China

## Research interests

Human-Computer Interaction, Cross-modal Learning, Multi-modal Interaction, Tactile Signal Processing, Haptic Interface, Virtual Reality

## Education

**City University of Hong Kong**

Hong Kong SAR, China

Ph.D in Creative Media

09/2019 – Present

Supervisor: Prof. Kening Zhu

**Huazhong Agricultural University**

Wuhan, China

B.Eng in Mechanical Design & Automation

09/2014 – 06/2018

Thesis: Designing of Automatic Flatness Detection System Based on PLC

## Publications

[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 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.*

[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.*

[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.*

[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** Taipei, China Taiwan  
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  
School of Creative Media, City University of Hong Kong Fall 2020

**SM2715: Creative Coding** Teaching Assistant  
School of Creative Media, City University of Hong Kong Spring 2021

Industry experience

**WISfur Thermal Technology** Wuhan, China  
Intern Summer 2017

**YTO Group Corporation** Luoyang, China  
Student Intern Summer 2016

Talks and tutorials

**ICAT-EGVE 2020** 12/2020

Online presentation for *FrictGAN* published in ICAT-EGVE 2020

**The Night of IEEE VR, China VR 2020 workshop** 05/2020

Online presentation for *ThermAirGlove* published in IEEE VR

**IEEE Virtual Reality 2020** 03/2020

Online oral presentation for the full paper of *ThermAirGlove*

**SIGGRAPH Asia 2019, Emerging Technologies** 11/2019

Oral presentation and real-time demo for *ThermAirGlove*

## Honors

Best Paper Audience Choice Award ICAT-EGVE 2020

Research Tuition Scholarship 2020/21 City University of Hong Kong

Special Thanks for Speakers China VR 2020

Outstanding Graduate Certificate 2018 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 2021 Papers

ICMI 2021 Papers

ISMAR 2021 Posters

UbiComp/ISWC 2021 Posters and Demos

CHI 2020 Papers (Special Recognitions)

VRST 2020 Papers

MobileHCI 2020 Papers (Special Recognitions)

SUI 2020 Papers

SIGGRAPH Asia 2019 & 2020 Emerging Technologies

CHI 2019 Late-Breaking Work

### Committee Member

CHI 2021 Late-Breaking Work

CHI 2020 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](mailto:keninzhu@cityu.edu.hk)

### **Prof. Takuji Narumi**

Research mentor

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

Email: [narumi@cyber.t.u-tokyo.ac.jp](mailto:narumi@cyber.t.u-tokyo.ac.jp)