Kevin Fan

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- HCI/VR/AR research in perception, cross-modal embodied interaction, augmented human.
- Collaborated with both academia and industrial researchers to advance interdisciplinary researches.
- Adept at developing interactive systems with (visual/auditory/haptics/tracking) components, and demonstrating at conferences and exhibitions with user experience in mind.
- Awarded Microsoft Research Asia PhD Fellowship for excellency in R&D.

EDUCATION

Graduate School of Media Design, Keio University, Tokyo, Japan
Ph.D. in Media Design 09/2013 – 03/2017
Thesis: Blended Reality: Extending Existence into Multiple Realities
Advisors: Prof. Naohito Okude, Prof. Masahiko Inami, Prof. Kouta Minamizawa

Master in Media Design 09/2011 – 09/2013
Thesis: Immersive Alternate Reality Experience through Ubiquitous Substitutional Reality
Advisors: Prof. Masahiko Inami, Prof. Kouta Minamizawa

University of British Columbia, Vancouver, BC, Canada 09/2006 – 06/2010
Bachelor of Applied Science in Computer Engineering (Software Engineering Option)

EXPERIENCE

Huawei Technologies Canada, Markham, Canada 03/2019 – present
HCI Researcher

wrnchAI, Montreal, Canada 04/2018 – 02/2019
Deep Learning Engineer
- Solving real-time marker-less motion capture using RGB camera image.
- Developed a human pose estimation training pipeline including data preprocessing, heatmap generation, data augmentation in Tensorflow.
- Utilized a VGG based CNN architecture for facial keypoints training and estimation.

National Institute of Advanced Industrial Science and Technology, Tokyo 04/2017 – 03/2018
Digital Human Research Group
Postdoctoral Researcher
- Designed and developed interaction methods connecting physical world and VR.
- Explored augmentation of body image in both VR and AR.
- Utilized human motion analysis and haptic feedback for assisting motor learning.
- Provided VR consultation for agile prototyping real world ergonomics evaluations.

National Institute of Advanced Industrial Science and Technology, Tokyo 04/2016 – 03/2017
Digital Human Research Group
Research Assistant
- Experimented with full-body motion capture for embodied VR experience.
- Expanded desktop ergonomics simulation to VR by developing support for digital human software.

Microsoft Research Asia, Beijing, China 05/2015 – 11/2015
HCI Group

Research Intern

- Studied human skin sensation in reaction to functional electric stimulation.
- Experimented with selectively stimulating skin receptors to elicit the sense of itch.

Singapore University of Technology and Design, Singapore 11/2013 – 01/2014
Augmented Human Lab
Research Intern

- Explored human augmentation of extended FOV with HMD and front and back cameras.
- Tinkered HMD hardware with software involving computer vision for motion detection.

RIKEN Brain Science Institute, Tokyo, Japan 04/2012 – 04/2013
Adaptive Intelligence Lab
Research Assistant

- Assisted the development and exhibitions of a VR system that blends the real world with the past.
- Acquainted with omnidirectional camera usage, video stitching, head-mount-displays.

AWARDS & GRANTS

- Microsoft Research Asia PhD Fellowship 2014
- Keio University Research Grant for Doctoral Students 2014
- Microsoft Research Asia CORE9 Funding 2013
- Promising Young Researcher's Award, VRSJ 2012 2012
- Monbukagakusho Honors Scholarship 2011
- President's Entrance Scholarship 2006
- B.C. Government Scholarship 2006

PUBLICATIONS & PATENTS

Publications

- Saniee-Monfared, G., **Fan, K**., Xu, Q., Mizobuchi, S., Zhou, L., Irani, P.P. and Li, W., Tent Mode Interactions: Exploring Collocated Multi-User Interaction on a Foldable Device. In Proc. MobileHCI 2020, ACM, 12 pages.
- **Fan, K.**, Murai, A., Miyata, N., Sugiura, Y. and Tada, M. Multi-Embodiment of Digital Humans in Virtual Reality for Assisting Human-Centered Ergonomics Design. In Augmented Human Research 2017, volume 2, article 7, 14 pages.
- **Fan, K.**, Chan, L., Kato, D., Minamizawa, K. and Inami, M. VR Planet: Interface for Meta-View and Feet Interaction of VR Contents. In Proc. SIGGRAPH 2016, VR Village, ACM, 2 pages.
- Outram, B., Pai, Y.S., **Fan, K.**, Minamizawa, K., and Kunze, K. AnyOrbit: Fluid 6DOF Spatial Navigation of Virtual Environments using Orbital Motion. In Proc. SUI 2016, ACM, 1 page.
- **Fan, K.**, Seigneur, J.M., Nanayakkara, S., and Inami, M. Electrosmog Visualization through Augmented Blurry Vision. In Proc. AH 2016, ACM, 2 pages.
- **Fan, K.**, Sugiura, Y., Minamizawa, K., Wakisaka, S., Inami, M., and Fujii, N. Ubiquitous Substitutional Reality: Re-Experiencing the Past in Immersion. In Proc. SIGGRAPH 2014, ACM, 1 page.
- **Fan, K.**, Huber, J., Nanayakkara, S., and Inami, M. SpiderVision: Extending the Human Field of View for Augmented Awareness. In Proc. AH 2014, ACM, 8 pages.
- Low, S., Sugiura, Y., **Fan, K.**, and Inami, M. Cuddly: Enchant Your Soft Objects With A Mobile Phone. In Proc. SIGGRAPH Asia 2013 Emerging Technologies, ACM, 2 pages.
- Low, S., Sugiura, Y., **Fan, K.**, and Inami, M. Cuddly: Enchant Your Soft Objects With A Mobile Phone. In Proc. ACE 2013, Springer, 12 pages.

- **Fan, K.**, Izumi, H., Sugiura, Y., Minamizawa, K., Wakisaka, S., Inami, M., Fujii, N, and Tachi, S. Reality Jockey: Lifting the Barrier between Alternate Realities through Audio and Haptic Feedback. In Proc. CHI 2013, ACM, 2557-2566.

Patents

- Kunita, Y. Ochi, D., Takahashi, K., Kojima, A., Inami, M., Uema, Y., **Fan, K.**, and Sugiura, Y. Image Presentation Method and System. Japan Provisional Patent: 2016-162426.

TEACHING & MENTORING

Keio University

Teaching Assistant – Graduate Course

Innovation Pipeline - Fabrication – Instructed by Prof. Kouta Minamizawa 01/2015 – 03/2015

Reality-Based Design – Instructed by Prof. Masahiko Inami 04/2014 – 07/2014

Master Thesis Mentoring

Pei Ying Chiang - Co-mentoring with Yuta Sugiura 2013 – 2015

"OriPOP : The Emotional Impact of Interactive Popcorn Packaging Design"

Suzanne Low - Co-mentoring with Yuta Sugiura 2012 – 2014

"Cuddly: Enchant Your Soft Objects With A Mobile Phone"

INVITED TALKS

"From Sensations to Embodiment: A Next Step in Virtual Reality" 08/2016

Digital Human Consortium, Tokyo, Japan

"Blended Reality: Beyond Time, Place, and Self" 12/2014

VRSJ Special Interest Group of Telexistence, Tokyo, Japan

SERVICE

Reviewer

CHI'21 | UIST'16'19 | IEEE VR'15'16'18'19 | TEI'17'18'19'21 | SIGGRAPH Asia'17'20 | Informatics'17 | Nature Scientific Reports'16 | AH'14'20

RESEARCH PROJECTS

Multi-Embodiment 07/2016 – 04/2017

- Full-body embodiment of multiple digital humans simultaneously in VR.
- Optical tracking of principal embodiment with inverse kinematics driven of extra embodiment.

VR Planet 02/2016 – 06/2016

- Stereographic projection of equirectangular videos as planet interface in VR.
- Designed a feet interaction method with the planet interface to expand our interaction channel

Electrosmog Visulization 11/2015 – 02/2016

- Gear VR as a see-through display for blurring visual view when electrosmog detected.
- Detected signal strength from celluar devices and video processing with Gaussian filters for blurring.

SpiderVision 11/2013 – 01/2014

- Augmented human awareness by extending the field of view with HMD to see both front and back.
- Utilized computer vision to analyze the optical flow of captured video image to detect movement.

Ubiquitous Substitutional Reality 04/2013 – 04/2014

- A spatial VR system for blending recorded memories with the live reality.
- Integration to the living household environment with sensor network embedded furniture.

Reality Jockey 04/2012 – 04/2013

- Cross-modal (audio, haptic) feedbacks to seamlessly blend pre-recorded scenarios with the live as one reality boundless by time.
- Utilized binaural audio and implicit haptic from haptic transducers to increase immersion.

TECHNICAL SKILLS

- **Languages:** C++, C#, Python, Java, Kotlin
- **VR/AR HMDs:** Oculus Rift, VIVE, Gear VR, Cardboard, HoloLens
- **VR/AR development:** Unity, UE4
- **Motion capture:** OptiTrack, Leap Motion, Kinect
- Web/omnidirectional cameras streaming/recording for VR/AR experience
- Knowledge of **audio interfaces, amplifiers** to achieve cross-modality in audio and haptics
- Image based **deep learning** using Tensorflow
- Arduino and hardware tinkering