Kevin Fan

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- HCI/VR/AR researcher/engineer with 7+ years of experience from native C++ to engines (Unity/UE5) using HMDs (Oculus/VIVE/HoloLens).
- Experienced in designing and building end-to-end interactive technical solutions for emerging products (XR, mobiles/wearables, vehicles, IoT), and delivering to stakeholders.
- Awarded Microsoft Research Asia PhD Fellowship for excellency in R&D.

TECHNICAL SKILLS

- **Languages:** C++, C#, Python, Java
- **VR/AR HMDs:** Oculus (Meta), HTC VIVE, HoloLens
- **VR/AR engines**: Unity, UE5
- **Motion capture:** OptiTrack, Leap Motion, Kinect
- **Machine and deep learning**: Scikit-learn, PyTorch, Tensorflow
- **Arduino** and hardware tinkering

EXPERIENCE

Huawei Canada, Toronto, Canada **03/2019 – present**
Senior HCI Researcher
- Research, design, and build interaction techniques and IP for emerging technology and products.

wrnchAI, Montreal, Canada **04/2018 – 02/2019**
Deep Learning Engineer
- Developed a human pose estimation training pipeline including data preprocessing, heatmap generation, data augmentation in Tensorflow (C++/Python) based on RGB camera image.
- Utilized a VGG based CNN architecture for facial keypoints training and estimation (Python).

National Institute of Advanced Industrial Science and Technology **04/2017 – 03/2018**
Postdoctoral Researcher
- Developed VR experience for embodying multiple digital humans with motion capture (C++)
- AR utilizing HoloLens for brining digital humans to the real world with embodiment (Unity).
- Utilize human motion analysis and haptic feedback for assisting motor learning.
- Provide VR consultation for agile prototyping real world interaction evaluations.

National Institute of Advanced Industrial Science and Technology **04/2016 – 03/2017**
Research Assistant
- Developed VR support (C++/Oculus native SDK) for a desktop digital human software platform.

Microsoft Research Asia – HCI Group **05/2015 – 11/2015**
Research Intern
- Experimented human skin in reaction to functional electric stimulation by designing PCB.

Singapore University of Technology and Design – Augmented Human Lab **11/2013 – 01/2014**
Research Intern
- Developed a video see-through HMD with Oculus using native SDK (C++/OpenGL).
- Utilized two cameras with video texture blending (GLSL shader) for extended HMD FOV.
- Computer vision optical flow analysis to detect movement surrounding HMD user.

RIKEN Brain Science Institute – Adaptive Intelligence Lab **04/2012 – 04/2013**
Research Assistant

- Assisted the development (C++/OpenGL) and exhibitions of virtual reality immersion system.
- Developed with omnidirectional camera video stitching, video-passthrough HMDs.

EDUCATION

Graduate School of Media Design, Keio University, Tokyo, Japan **09/2013 – 03/2017**
Ph.D. in Media Design (HCI/VRAR)
Thesis: Blended Reality: Extending Existence into Multiple Realities
Advisors: Prof. Masahiko Inami and Prof. Kouta Minamizawa
Awards: Microsoft Research Asia Fellowship, Keio University Research Grant

Graduate School of Media Design, Keio University , Tokyo, Japan **09/2011 – 09/2013**
Master in Media Design (HCI/VRAR)
Thesis: Immersive Alternate Reality Experience through Ubiquitous Substitutional Reality
Advisors: Prof. Masahiko Inami and Prof. Kouta Minamizawa
Awards: VRSJ Promising Young Researcher's Award

University of British Columbia, Vancouver, B.C., Canada **09/2006 – 06/2010**
Bachelor of Applied Science in Computer Engineering (Software Engineering Option)
Awards: President's Entrance Scholarship, B.C. Government Scholarship

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

- Bardot, S., Rey, B., Audette, L., **Fan, K.**, Huang, D.Y., Li, J., Li, W. and Irani, P. One Ring to Rule Them All: An Empirical Understanding of Day-to-Day Smartring Usage Through In-Situ Diary Study. In Proc. IMWUT 2022 vol 6(3), ACM, pp.1-20.
- Herath, A., Rey, B., Bardot, S., Rempel, S., Audette, L., Zheng, H., Li, J., **Fan, K.**, Huang, D.Y., Li, W. and Irani, P. Expanding Touch Interaction Capabilities for Smart-rings: An Exploration of Continual Slide and Microroll Gestures. In Proc. CHI EA 2022, ACM, pp. 1-7.
- Bardot, S., Rawat, S., Nguyen, D.T., Rempel, S., Zheng, H., Rey, B., Li, J., **Fan, K.**, Huang, D.Y., Li, W. and Irani, P. ARO: Exploring the Design of Smart-Ring Interactions for Encumbered Hands. In Proc. MobileHCI 2021, ACM, pp. 1-11.
- Faleel, S.A., Gammon, M., **Fan, K**., Huang, D.Y., Li, W. and Irani, P. HPUI: Hand Proximate User Interfaces for One-Handed Interactions on Head Mounted Displays. In Proc. IEEE TVCG 20021 vol 27(11), IEEE, 4215-4225.
- 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

- **Fan, S.W.**, Khan, T.A. and Li, W., 2022. Methods and systems for selection of objects. U.S. Patent Application 17/127,022.
- Khan, T.A., **Fan, S.W.**, Changqing, Z.O.U. and Li, W., Huawei Technologies Co Ltd, 2022. Devices, methods, systems, and media for selecting virtual objects for extended reality interaction. U.S. Patent 11,327,630.
- Changqing, Z.O.U., Akhtar, Y.W., **Fan, S.W.**, Jianpeng, X. and Li, W., 2022. Methods and systems for rendering virtual objects in user-defined spatial boundary in extended reality environment. U.S. Patent Application 17/187,663.
- **Fan, S.W.**, Hengguang, Z.H.O.U., Xu, Q. and Li, W., Huawei Technologies Co Ltd, 2021. System and method for video processing using a virtual reality device. U.S. Patent US20210349308A1.
- 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

ACADEMIC SERVICE

Reviewer
CHI'21 | UIST'16'19'23 | IEEE VR'15'16'18'19 | TEI'17'18'19'21'22'23'24 | SIGGRAPH Asia'17'20 | Informatics'17 | Nature Scientific Reports'16 | AH'14'20

Committee
MobileHCI 2022 Student Design Competition Co-Chair