Dr. Jingwen Dai

Contact Information

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Summary

- 10+ years' research and development experience in the domain of computer vision, and its applications in human-computer interaction, & virtual/augmented reality.
- Strong team leadership skills in effective product planning, task oversight and rapid technology transfer, and multi-cultural and multi-national working experience in US, Singapore, Hong Kong and China.

Working Experience

Guangdong Virtual Reality Technology Co., Ltd. (aka. Ximmerse), Shenzhen, China

Co-Founder, Executive Director & CTO **08/2015 - present**

- Board member and lead the whole R&D and engineering team (40+ scientists and engineers of algorithm, hardware, embedded software, SDK, testing and engineering teams).
- *Products Highlights*

2019 **(AR)** HoloWorld: A mixed reality location-based entertainment (LBE) solution.

2019 **(AR)** Blaster: A mixed reality PvP shooting experience with NetEase Games.

2019 **(AR)** LENOVO & DISNEY MIRAGE 1.5 with Marvel Dimension of Heros.
https://www.lenovo.com/us/en/mirage-ar/

2019 **(AR)** Rhino X: An all-new mixed reality system is made up of the Rhino X standalone headset and X-Tag based inputs.
https://www.ximmerse.com/rhinox

2018 **(AR)** Slide-in AR headset with ultra wide FOV and unique computer vision based tracking and interaction technology, enabling 6-DoF headset tracking and 6-DoF peripherals tracking.

2018 **(AR)** VisorX headset, designed for hands-free fun, play and work. Turn the small phone screen into a big screen.
https://www.ximmerse.com/visor-x

2017 **(AR)** LENOVO & DISNEY MIRAGE 1.0 with Star Wars: Jedi Challenges.
http://www3.lenovo.com/us/en/jedichallenges/

2017 **(AR)** 3-DoF controller product for MIRA.
https://www.mirareality.com

2017 **(VR)** 6-DoF outside-in VR controller product for HTC LINK.
https://www.htc.com/jp/virtual-reality/link/

2017 **(VR)** 3-DoF VR controller product for ZEISS VR ONE CONNECT.
https://www.zeiss.com/virtual-reality/vr-one-connect.html

2017 **(VR)** 3-DoF VR controller product for OCCIPITAL BRIDGE.
https://bridge.occipital.com

2017 **(VR)** 3-DoF controller in QUALCOMM HMD Accelerator Program (HAP).
https://www.qualcomm.com/news/onq/2017/06/27/shift-mobile-vr-now

2016 **(VR)** 6-DoF VR controller in SAMSUNG Accessary Partership Program (SMAPP).

2016 **(VR)** 3-DoF VR controller solution for XIAOMI MiVR.
http://www.mi.com/mivr/

Lenovo Research & Technology, Hong Kong

Manager & Advisory Researcher, Image & Visual Computing Lab **04/2015 - 07/2015**

- Lead of 3D vision group (6 researchers & 4 engineers), contributing total 3D vision solution to Lenovo Mobile BU, depth based applications of refoucus, magic cut-out and 3D gadget will be launched in Lenovo VIBE S1 in June 2015.

Staff Researcher, Image & Visual Computing Lab **01/2014 - 03/2015**

- Technical lead of Super Camera group (3 researchers & 6 engineers), delivering intelligent photography solution to Lenovo Mobile BU, real-time smart composition guide feature has been launched in Lenovo VIBE Shot in May 2015.
- Lead of immersive communication group, prototyping next generation video conference system and tele-presence system.
- Key member of FunnyFace project and push face beautification features (the world first successful case in real-time video call) to Lenovo's video call software *YouYue* in March 2014.
- Principal contributor of Lenovo first gaze correction technology for home video conferencing.

The University of North Carolina *at* Chapel Hill, NC, USA

Postdoctoral Research Associate, Department of Computer Science **11/2012 - 12/2013**

- Research staff in BeingThere Center UNC. Involved in project of mobile animatronics telepresence system and room-size telepresence system.

Nanyang Technological University, Singapore

UNC Visiting Researcher **01/2013 - 12/2013**

- Collaborate with the researchers from ETH Zurich and NTU Singapore to develop next generation telepresence system prototypes.

HJTech, Shanghai, China

Senior Research Engineer **04/2010 - 10/2012**

- In charge of architecture and algorithm design for face identification based immigration clearance system, which will be applied in Shanghai Yangshan Port.
- Involved in algorithm transplantation on embedded system (DaVinci and ARM platform). In charge of algorithm simplification and optimization.

Co-Founder & CTO **03/2009 - 07/2009**

- Co-founded a technology company via funds from venture capital, which is focus on face recognition related products. The core technology is mainly based on my master research works.
- Led the R&D team to optimize face recognition algorithms and develop application software.
- The face identification based products had been applied in many areas: Checking attendance in office buildings and schools in Shanghai; Access control in residences in Shanghai and Jiangsu and in prisons in Jiangsu, Guangdong and Jiangxi.

The Chinese University of Hong Kong, Hong Kong

Research Assistant, Computer Vision Lab **08/2009 - 08/2012**

- Involved in several research projects partially sponsored by Hong Kong Research Grants Council, Qualcomm and CUHK MoE-Microsoft Key Laboratory of Human-Centric Computing and Interface Technologies.
- Research area focused on human-computer interaction in projector-camera system.
- Developed a real-time 6-DOF human head pose estimation system under normal illumination embedded with imperceptible structured codes.
- Developed a natural user interface, making any tabletop surface to which the projection is illuminated become a touch-sensitive computer screen, just by a mere video projector and camera.

Project Supervisor, Computer Vision Lab **03/2010 - 08/2012**

In charge of several projects collaborated with companies, short-time RAs and students.

- ASTRI (R&D Company founded by HK Government): "Real-time 3D scanner".
- Matt Fisher (Exchange Student from UC Berkeley): "User-Friendly ProCam Calibration".
- Tiffany Yip (Short Time RA): "Automatic Facial Feature Points Detection".
- Tao Lin (M.S. Student of CUHK): "Fusing Kinect Depth Map".
- Guijin Zou (Exchange Student from Peking Univ.): "3D Reconstruction from one shot".

Shanghai Jiaotong University, Shanghai, China

Research Assistant, Research Center of Intelligent Robotics **09/2006 - 02/2009**

- Involved in computer vision group, which is partially sponsored by National Natural Foundation of China and Program for New Century Excellent Talents of Ministry of Education, China.
- Research area focused on face detection, face tracking and face recognition.
- Developed a real-time face recognition system independently, which is the foundation for HJTech products.

Education

The Chinese University of Hong Kong (CUHK), Hong Kong **08/2009 - 09/2012**

Ph.D. in Computer Vision, Department of Mechanical and Automation Engineering

- PhD Thesis: "Use of Projector-Camera System for Human-Computer Interaction"
- GPA: 3.8/4.0

Shanghai Jiaotong University (SJTU), Shanghai, China **09/2006 - 03/2009**

M.E. in Robotics, Department of Automation

- Master Thesis: "The Fundamental Research of Practical Face Recognition System"
- Major GPA: 3.7/4.0, Top 5%

Publications

Thesis

- J. Dai, Use of Projector-Camera System for Human-Computer Interaction, *PhD Thesis*, The Chinese University of Hong Kong, September 2012.
- J. Dai, The Fundamental Research of Practical Face Recognition System, *Master Thesis (in Chinese)*, Shanghai Jiao Tong University, January 2009.

Journal Paper

- G. Yu, Y. Hu and J. Dai, TopoTag: A Robust and Scalable Topological Fiducial Marker System, *IEEE Transactions on Visualization and Computer Graphics, To appear*, 2020.
- J. Dai and R. Chung, Touchscreen Everywhere: On Transferring a Normal Planar Surface to a Touch-Sensitive Display, *IEEE Transactions on System, Man and Cybernetics, Part B*, 44(8):1383-1396, 2014.
- J. Dai and R. Chung, Embedding Invisible Codes into Normal Video Projection: Principle, Evaluation and Applications, *IEEE Transactions on Circuit and System for Video Technology*, 23(12):2054-2066, 2013.
- J. Dai, D. Liu and J. Su, The Method of Rapid Eye Localization Based on Projection Peak, *Pattern Recognition and Artificial Intelligence (in Chinese, Indexed by EI)*, 22(4):605-609, 2009.

Conference Paper

- J. Dai, G. Welch and H. Fuchs, Encumbrance-free Shader Lamps Avatars for Tele-presence, *In Preparation.*
- Z. Lu, Y. Hu, and J. Dai, WatchAR: 6-DoF Tracked Watch for AR Interaction, *In Proc. of IEEE International Symposium on Mixed and Augmented Reality - Demo (ISMAR'19)*, 2019.
- Y. Hu, J. Ren, J. Dai, C. Yuan, L. Xu and W. Wang, Deep Multimodal Speaker Naming, *In Proc. of The 23rd Annual ACM International Conference on Multimedia (MM'15)*, 2015.
- J. Dai and R. Chung, Sensitivity Evaluation of Embedded Code Detection in Imperceptible Structured Light Sensing, *In Proc. of IEEE Winter Vision Meetings - Workshop on Robot Vision (WoRV'13)*, pages 34-39, 2013.
- J. Dai and R. Chung, Making Any Planar Surface into a Touch-sensitive Display by a Mere Projector and Camera, *In Proc. of 25th IEEE Conference on Computer Vision and Pattern Recognition (CVPR'12) - Workshop (PROCAMS'12)*, pages 35-42, 2012.
- J. Dai and R. Chung, On Making Projector both a Display Device and a 3D Sensor, *In Proc. of The 8th International Symposium on Visual Computing (ISVC'12)*, pages 654-664, 2012.
- J. Dai and R. Chung, Combining Contrast Saliency and Region Discontinuity for Precise Hand Segmentation in Projector-Camera System, *In Proc. of The 21st International Conference on Pattern Recognition (ICPR'12)*, pages 2161-2164, 2012.
- J. Dai and R. Chung, Embedding Imperceptible Codes into Video Projection and Applications in Robotics, *In Proc. of IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS'12)*, pages 4399-4404, 2012.
- J. Dai and R. Chung, Head pose estimation by imperceptible structured light sensing, *In Proc. of IEEE International Conference on Robotics and Automation(ICRA'11)*, pages 1646-1651, 2011.
- J. Dai, D. Liu and J. Su, Projection Peak Analysis for Rapid Eye Localization, *In Proc. of*

The International Conference on Computer Vision Theory and Applications(VISAPP'09), pages 315-320, 2009.

- F. Yang, J. Dai and D. Liu, A novel eye localization method based on spectral residual model, *In Proc. of The 7th World Congress on Intelligent Control and Automation(WCICA'08)*, pages 6773-6777, 2008.
- F. Yang, J. Su and J. Dai, Fast Quality Assessment of Face Images for Face Recognition, *In Proc. of The 27th Chinese Control Conference(CCC'08)*, pages 531-535, 2008.

US & Intl. Patents

Grant

- J. He, J. Dai, C. Wan and Y. Hu, Image processing apparatuses and methods, *US Patent No. 10,402,988*, granted on September 3, 2019.
- J. Dai, Y. Hu and J. He, Electronic tracking device, electronic tracking system and electronic tracking method, *US Patent No. 10,347,002*, granted on July 9, 2019.
- J. Dai, Y. Hu and J. He, Methods, devices, and systems for identifying and tracking an object with multiple cameras, *US Patent No. 10,319,100*, granted on June 11, 2019.

Application

- J. Dai and J. He, Augmented reality method, system and terminal device of displaying and controlling virtual content via interaction device, *US Patent Pub. No. 2020/0143600*, filed on December 31, 2019.
- S. Huang, J. Dai and J. He, Three-dimensional display method, terminal device, and storage medium, *US Patent Pub. No. 2020/0134927*, filed on December 31, 2019.
- G. Wang, J. Dai, J. He, Y. Wu and L. Cai, Communication connection method, terminal device and wireless communication system, *US Patent Pub. No. 2020/0137815*, filed on December 27, 2019.
- Y. Wu, Y. Hu, J. Dai and J. He, Method of controlling virtual content, terminal device and computer readable medium, *US Patent Pub. No. 2020/0126267*, filed on December 19, 2019.
- Y. Hu, G. Yu and J. Dai, Method of device tracking, terminal device, and storage medium, *US Patent Pub. No. 2020/0090365*, filed on November 19, 2019.
- Y. Yin, G. Yu, Y. Qiao, J. Dai and J. He, Method of displaying virtual content based on markers, *US Patent Pub. No. 2020/0066054*, filed on October 29, 2019.
- Y. Hu, S. Huang, J. Dai and J. He, Interactive method for virtual content and terminal device, *US Patent Pub. No. 2020/0043242*, filed on October 14, 2019.
- X. Piao, J. Dai and J. He, Date processing system and method, *US Patent Pub. No. 2019/0386762*, filed on August 29, 2019.
- G. Wang, J. Dai and J. He, Method, device and system for establishing communication connection, *US Patent Pub. No. 2019/0364609*, filed on August 9, 2019.
- J. Dai and J. He, Augmented reality method for displaying virtual object and terminal device therefor, *US Patent Pub. No. 2019/0362559*, filed on August 7, 2019.
- J. He and J. Dai, Virtual reality interaction system and method, *US Patent Pub. No. 2019/0339768*, filed on July 17, 2019.
- Y. Yin, J. Dai and J. He, System for sharing virtual content and method for displaying virtual content, *US Patent Pub. No. 2019/0294403*, filed on June 5, 2019.
- J. He, J. Dai, C. Wan and Y. Hu, Method and device for searching stripe set, *US Patent Pub. No. 2019/0045720*, filed on September 21, 2018.
- J. He, J. Dai, C. Wan and Y. Hu, Image processing apparatuses and methods, *US Patent Pub. No. 2019/0180452*, filed on December 12, 2017.
- J. Dai, Y. Hu and J. He, Electronic tracking device, electronic tracking system and electronic tracking method, *PCT Patent Pub No. WO2019/000621*, filed on August 29, 2017.
- Y. Hu, J. Dai and J. He, Method, device and system for identifying light spot, *US Patent Pub. No. 2019/0385340*, filed on August 29, 2017.
- J. Dai and J. He, Methods and systems for operating an apparatus through augmented reality, *US Patent Pub. No. 2019/0005636*, filed on July 23, 2017.
- Z. Lu, J. Dai and J. He, Electronic systems and methods for text input in a virtual environment, *US Patent Pub. No. 2019/0004694*, filed on July 23, 2017.
- Y. Hu, J. Dai and J. He, Method and device for identifying light source, *US Patent Pub. No. 2019/0392590*, filed on June 21, 2017.
- J. He, J. Dai, C. Wan and Y. Hu, Method, device and terminal for determining effectiveness of stripe set, *US Patent Pub. No. 2018/0173327*, filed on March 22, 2016.
- J. He, J. Dai, T. Zhu and C. Wan, Apparatus, methods, and systems for tracking an optical

object, *PCT Patent Pub No. WO2017/070836*, filed on October 27, 2015.

Invited Talks

2019

- Augmented Reality: From Interaction Perspective, *ARUP Workshop, Hong Kong, China*, September 2019.
- Augmented Reality: From Interaction Perspective (in Chinese), *China International Optoelectronic Conference, Shenzhen, China*, September 2019.
- Augmented Reality: Connecting Everything (in Chinese), *Bluetooth Asia, Shenzhen, China*, May 2019.
- Augmented Reality: Interaction and Connection, *School of Software, Shanghai Jiao Tong University, Shanghai, China*, April 2019.
- Augmented Reality: Interaction and Connection, *Department of Computer Science, University of North Carolina at Chapel Hill, NC, USA*, January 2019.

2018

- Augmented Reality: Interaction and Connection (in Chinese), *OmniVision Technologies New Products Global Launch, Shanghai, China*, October 2018.
- Augmented Reality: From Gaming Perspective (in Chinese), *The 15th Game Development and Operations Conference (GDOC'18), Tencent Interactive Entertainment Group (IEG), Shenzhen, China*, June 2018.
- Augmented Reality: Interaction and Connection, *Flex Shanghai Design and Innovation Center Opening Ceremony, Shanghai, China*, June 2018.
- Augmented Reality: Interaction and Connection (in Chinese), *Bluetooth Asia, Shenzhen, China*, May 2018.

2017

- New Era of Augmented Reality, *OmniVision Technologies New Products Global Launch, Shanghai, China*, October 2017.

2016

- Mobile VR Input Platform, *Samsung Research America, Mountain View, CA, USA*, June 2016.
- Virtual Reality: From Input Perspective, *Clear Water Bay Forum, Hong Kong University of Science and Technology, Hong Kong, China*, June 2016.

2015

- VR Interaction and Development Trends, *Future Information Technology International Forum for Young Scholars (SIFYS), Shanghai Jiao Tong University, Shanghai, China*, October 2015.
- VR Development From Input Perspective, *School of Computer Science and Engineering, Nanjing University of Science and Technology, Nanjing, China*, October 2015.

Honors & Awards

Peacock Plan (Level C) of Shenzhen **2016**

FY14/15 Excellent Performance Employee of Lenovo R&T **2015**

FY14/15 Outstanding Team Award(Super Camera) of Lenovo R&T **2015**

FY14/15 1H Excellent Performance Employee of Lenovo R&T **2014**

FY14/15 1H Excellent Project Team (Super Camera) of Lenovo R&T **2014**

Individual Instant Award of Lenovo R&T **2014**

Postgraduate Fellowship of The Chinese University of Hong Kong **2009-2012**

Excellent Student of Shanghai Jiaotong University **2008**

Kwang-Hua Scholarship of Shanghai Jiaotong University **2008**

Excellent League Member of Shanghai Jiaotong University **2007**

JIDIAN Electronics Technology Scholarship of Shanghai Jiaotong University **2007**

Full Tuition Scholarship of Shanghai Jiaotong University **2006-2009**