

## Dr. Jingwen Dai

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### CONTACT INFORMATION

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Nanshan District, Shenzhen,  
Guangdong, China

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Website: <http://jwdai.github.io/>

### 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 Accessory Partnership 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 refocus, 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**

- 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 (12)

- Y. Yin, J. Dai and J. He, System for sharing virtual content and method for displaying virtual content, *US Patent No. 10,922,042*, granted on February 16, 2021.
- Y. Hu, J. Dai and J. He, Method, device and system for identifying light spot, *US Patent No. 10,922,846*, granted on February 16, 2021.
- Y. Hu, J. Dai and J. He, Method and device for identifying light source, *US Patent No. 10,916,020*, granted on February 9, 2021.
- J. He, J. Dai, C. Wan and Y. Hu, Method and device for searching stripe set, *US Patent No. 10,915,750*, granted on February 9, 2021.
- Y. Hu, J. Dai and J. He, Method and device for identifying flashing light source, *US Patent No. 10,895,799*, granted on January 19, 2021.
- S. Huang, J. Dai and J. He, Method and device for aligning coordinate of controller or headset with coordinate of binocular system, *US Patent No. 10,802,606*, granted on October 13, 2020.
- J. He, J. Dai, C. Wan and Y. Hu, Method, device and terminal for determining effectiveness of stripe set, *US Patent No. 10,795,456*, granted on October 6, 2020.
- G. Wang, J. Dai and J. He, Method, device and system for establishing communication connection, *US Patent No. 10,785,812*, granted on September 22, 2020.
- J. He, J. Dai, T. Zhu and C. Wan, Apparatus, methods, and systems for tracking an optical object, *US Patent No. 10,709,967*, granted on July 14, 2020.
- 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 (19)

- 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.
- 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, 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

### 2020

- Mixed Reality: Starting from Spatial Interaction (in Chinese), *Shanghai Jiao Tong University, Shanghai, China*, November 2020.
- Mixed Reality: Starting from Spatial Interaction (in Chinese), *Sichuan University, Chendu, China*, October 2020.
- Mixed Reality: Creating a New World by Spatial Interaction (in Chinese), *China International Optoelectronic Conference, Shenzhen, China*, August 2020.
- Mixed Reality Interaction: Leading the New Trend of Off-line Entertainment, *World Conference on VR Industry, Nanchang, China*, October 2020.

### 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