Xiaoming Deng

CONTACT INFORMATION

Professor
Beijing Key Laboratory of Human-Computer Interaction
Institute of Software, Chinese Academy of Sciences
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Zhong Guan Cun, Beijing 100190, P.R. China

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RESEARCH INTERESTS

Computer vision: Capture and synthesize high-quality 3D/2D human gestures, design gesture-based user interface, and understand 3D/2D scene.

ACADEMIC APPOINTMENTS

Professor September 2021 to present
Beijing Key Laboratory of Human-Computer Interaction, Institute of Software, Chinese Academy of Sciences (ISCAS)

Associate Professor July 2011 to August 2021
Beijing Key Laboratory of Human-Computer Interaction, Institute of Software, Chinese Academy of Sciences (ISCAS)

Research Fellow April 2012 to June 2013
Department of Electrical & Computer Engineering, National University of Singapore (NUS)
- Advisor: Professor Ping Tan

Assistant Professor June 2010 to June 2011
Beijing Key Laboratory of Human-Computer Interaction, Institute of Software, Chinese Academy of Sciences

Postdoctoral Research Fellow January 2008 to May 2010
Virtual Reality Laboratory, Institute of Computing Technology, Chinese Academy of Sciences (ICT,CAS)
- Advisor: Professor Zhaoqi Wang
- Also working with Professor Shihong Xia

EDUCATION

National Laboratory of Pattern Recognition (NLPR), Institute of Automation, Chinese Academy of Sciences, Beijing, China

Ph.D., Pattern Recognition and Intelligent System, January 2008
- Thesis Topic: *Omnidirectional Camera Calibration and 3D Reconstruction*
- Advisor: Professor Fuchao Wu
- Also working with Professor Zhanyi Hu and Professor Yihong Wu
- Area of Study: Computer Vision

School of Mathematics and Statistics, Wuhan University, Wuhan, China

B.S. and M.S., Applied Mathematics, Computational Mathematics, June 2001 and June 2004

AWARDS AND HONORS

- Excellent Young Scientist, Chinese Simulation Federation, 2019.
- CCF Science and Technology Award Invention Award: Key Technology of 3D Dynamical Human Modelling and Applications (the first prize), 2018.
- Distinguished Young Researcher Program, Institute of Software, Chinese Academy of Sciences, 2015.
- NVIDIA Hardware Grant, 2015, 2016.
- Excellent Young Researcher Program, Institute of Software, Chinese Academy of Sciences, 2014.
- Member of Youth Innovation Promotion Association, Chinese Academy of Sciences, 2013.

- K.C.Wong Post-doctoral Fellowship Award, 2009 (Awarded annually to 50 post-doctoral research fellows from all institutes of Chinese Academy of Sciences).
- Huawei Scholarship for Outstanding Graduate Students, 2003.

SELECTED PREPRINT

[1] Xiaoming Deng, Shuo Yang, Yinda Zhang, Ping Tan, Liang Chang, Hongan Wang. Hand3D: Hand Pose Estimation using 3D Neural Network. *arXiv:1704.02224* [cs.CV] (7 Apr 2017).

SELECTED REFEREED JOURNAL PUBLICATIONS

[2] Xiaoming Deng, Yinda Zhang, Jian Shi, Yuying Zhu, Dachuan Cheng, Dexin Zuo, Zhaopeng Cui, Ping Tan, Liang Chang, Hongan Wang. Hand Pose Understanding with Large-Scale Photo-Realistic Rendering Dataset. *IEEE Transactions on Image Processing*. (2021)

[3] Xiaoming Deng, Yuying Zhu, Yinda Zhang, Zhaopeng Cui, Ping Tan, Wentian Qu, Cuixia Ma, Hongan Wang. Weakly Supervised Learning for Single Depth-Based Hand Shape Recovery. *IEEE Transactions on Image Processing*. (2021)

[4] Xiaoming Deng, Yinda Zhang, Shuo Yang, Ping Tan, Liang Chang, Ye Yuan, Hongan Wang. Joint Hand Detection and Rotation Estimation Using CNN. *IEEE Transactions on Image Processing* (2018)

[5] Zihao Zhang, Lei Hu, Xiaoming Deng, and Shihong Xia. Weakly Supervised Adversarial Learning for 3D Human Pose Estimation from Point Clouds. *IEEE Transactions on Visualization and Computer Graphics* (2020)

[6] Kevin Maher, Zeyuan Huang, Jiancheng Song, Xiaoming Deng, Yu-Kun Lai, Cuixia Ma, Hao Wang, Yong-Jin Liu, and Hongan Wang. E-ffective: A Visual Analytic System for Exploring the Emotion and Effectiveness of Inspirational Speeches. *IEEE Transactions on Visualization and Computer Graphics* (2021)

[7] Xiaobing Du, Cuixia Ma, Guanhua Zhang, Jinyao Li, Yu-Kun Lai, Guozhen Zhao, Xiaoming Deng, Yong-Jin Liu, Hongan Wang, An Efficient LSTM Network for Emotion Recognition from Multichannel EEG Signals. *IEEE Transactions on Affection Computing* (2020)

[8] Wei Zhang, Zeyi Lin, Jian Cheng, Cuixia Ma, Xiaoming Deng*, Hongan Wang*, STA-GCN: Two-Stream GCN with Spatial-Temporal Attention for Hand Gesture Recognition. *The Visual Computer Journal* (2020)

[9] Liang Chang, Lihua Jin, Lifen Weng, Wentao Chao, Xuguang Wang, Xiaoming Deng*, Qiulei Dong*, Face Sketch Learning with Human Sketch Drawing Order Enforcement. *Science China Information Sciences* (2020)

[10] Sa Wang, Zhengxin Cheng, Xiaoming Deng, Liang Chang, Fuqing Duan, Ke Lu, Leveraging 3D Blendshape for Facial Expression Recognition using CNN. *Science China Information Sciences* 63(2) (2020)

[11] Dachuan Cheng, Jian Shi, Yanyun Chen, Xiaoming Deng, Xiaopeng Zhang. Learning Scene Illumination by Pairwise Photos from Rear and Front Mobile Cameras. *Computer Graphics Forum* (2018)

[12] Liang Chang, Xiaoming Deng*, Mingquan Zhou, Zhongke Wu, Ye Yuan, Shuo Yang, Hongan Wang. Convolutional Neural Networks in Image Understanding. *Acta Automatica Sinica(AAS)* (2016)

[13] Xiaoming Deng, Fuchao Wu, Yihong Wu, Fuqing Duan, Liang Chang, and Hongan Wang. Self-calibration of Hybrid Central Catadioptric and Perspective Cameras. *Computer Vision and Image Understanding* 116(6): 715-729 (2012)

[14] Fuqing Duan, Fuchao Wu, Mingquan Zhou, Xiaoming Deng, and Yun Tian. Calibrating Effective Focal Length for Central Catadioptric Cameras using One Space Line. *Pattern Recognition Letters* 33(5): 646-653 (2012)

[15] Hui Zeng, Xiaoming Deng, and Zhanyi Hu. A New Normalized Method on Line-based Homography Estimation. *Pattern Recognition Letters* 29(9): 1236-1244 (2008)

[16] Liang Chang, Xiaoming Deng, Suiwu Zheng, Yongqing Wang. Scaling Up Kernel Grower Clustering Method for Large Data Sets via Core-sets. *Acta Automatica Sinica(AAS)* 34 (3): 376-382(2008)

[17] Xiaoming Deng, Fuchao Wu, Yihong Wu. An Easy Calibration Method for Central Catadioptric Cameras, *Acta Automatica Sinica(AAS)* (2007)

SELECTED CONFERENCE PUBLICATIONS

[18] Jian Cheng#, Yanguang Wan#, Dexin Zuo, Cuixia Ma, Jian Gu, Ping Tan, Hongan Wang, Xiaoming Deng*, Yinda Zhang*, Efficient virtual view selection for 3D hand pose estimation, *AAAI* 2022.

[19] Baowen Zhang, Yangang Wang, Xiaoming Deng*, Yinda Zhang*, Ping Tan, Cuixia Ma, Hongan Wang, Interacting two-hand 3D pose and shape reconstruction from single color image, *ICCV* 2021.

[20] Zihao Zhang#, Lei Hu#, Xiaoming Deng#, Shihong Xia*. Sequential 3D human pose estimation using adaptive point cloud sampling strategy, *IJCAI* 2021.

[21] Fang Liu, Changqing Zou, Xiaoming Deng*, Ran Zuo, Yu-Kun Lai, Cuixia Ma*, Yong-Jin Liu* and Hongan Wang. SceneSketcher: Fine-Grained Image Retrieval with Scene Sketches, *ECCV* 2020.

[22] Zeyi Lin, Wei Zhang, Xiaoming Deng*, Cuixia Ma and Hongan Wang*. Image-based Pose Representation for Action Recognition and Hand Gesture Recognition. *FG* 2020.

[23] Fang Liu, Xiaoming Deng, Yu-Kun Lai, Yong-Jin Liu, Cuixia Ma and Hongan Wang. SketchGAN: Joint Sketch Completion and Recognition with Generative Adversarial Network. *CVPR* 2019.

[24] Wentao Chao, Liang Chang, Xuguang Wang, Jian Cheng, Xiaoming Deng, Fuqing Duan. High-fidelity Face sketch-to-photo Synthesis Using Generative Adversarial Network. *ICIP* 2019.

[25] Yikun Dou, Xuguang Wang, Yuying Zhu, Xiaoming Deng*, Cuixia Ma, Liang Chang, Hongan Wang. Cascaded Point Network for 3D Hand Pose Estimation. *ICASSP* 2019.

[26] Yikun Wang, Liang Chang, Yuhua Cheng, Lihua Jin, Zhengxin Cheng, Xiaoming Deng, Fuqing Duan. Text2Sketch: Learning Face Sketch from Facial Attribute Text. *ICIP* 2018 (oral presentation).

[27] Liang Chang, Yves Rozenholc, Xiaoming Deng, Fuqing Duan, Mingquan Zhou. Face Sketch Synthesis Using Non-local Means and Patch-based Seaming. *ICIP* 2015 (oral presentation).

[28] Xiaoming Deng, Jie Liu, Feng Tian, Liang Chang, Hongan Wang. Motion Estimation of Multiple Depth Cameras Using Spheres. *ICIP* 2014.

[29] Xiaoming Deng, Shihong Xia, Wenzhong Wang, Zhaoqi Wang, Liang Chang, Hongan Wang. Automatic Gait Motion Capture with Missing-marker Fillings. *ICPR* 2014.

[30] Zhenglong Zhou, Bo Shu, Shaojie Zhuo, Xiaoming Deng, Ping Tan, Stephen Lin. Image-based Clothes Animation for Virtual Fitting. *SIGGRAPH Asia* 2012 Technique Briefs.

[31] Liang Chang, Xiaoming Deng, Mingquan Zhou, Fuqing Duan, Zhongke Wu: Smoothness-constrained Face Photo-sketch Synthesis using Sparse Representation. *ICPR* 2012.

[32] Xiaoming Deng, Fuchao Wu, Yihong Wu, Liang Chang, Wei Liu, Hongan Wang. Calibration of Central Catadioptric Camera with One-dimensional Object undertaking General Motions. *ICIP* 2011 (oral presentation).

[33] Liang Chang, Mingquan Zhou, Yanjun Han, Xiaoming Deng. Face Sketch Synthesis via Sparse Representation. *ICPR* 2010 (oral presentation).

[34] Wenzhong Wang, Xiaoming Deng, Xianjie Qiu, Shihong Xia, Zhaoqi Wang. Learning Local Models for 2D Human Motion Tracking. *ICIP* 2009: 2589-2592

[35] Xiaoming Deng, Fuchao Wu, Yihong Wu, Fuqing Duan. Visual Metrology with Uncalibrated Radial Distorted Images. *ICPR* 2008.

GRANTS

PI, "Hand Motion Capture with a Depth Sensor ", Key Project of Beijing NSF Program, 2019-2021.

PI, "Human Gait Analysis", Industrial Project, 2018-2019.

PI, "Human Motion Capture, Analysis and Interactions: A Computer Vision Approach ", Distinguished Young Researcher Program, ISCAS, 2015-2020.

PI, "Markerless Human Motion Capture with a Depth Camera", NSF of China, 2014-2018.

PI, "Geometric Computing of Multiple Depth Cameras and Its Applications in 3D Reconstruction", Youth Innovation Promotion Association of CAS, 2012-2015.

PI, "SLAM with a Omnidirectional Camera", NSF of China, 2011-2013.

PI, "Geometric Computing of Omnidirectional Vision", NLPR open grant, 2010-2011.

PI, "Automatic Gait Motion Capture and its Clinical Applications", Chinese Postdoctoral Council, 2009-2010.

CURRENT STUDENTS

Name	Degree	Research Topic
Wentian Qu	PhD	Hand Shape/Pose Estimation
Jian Cheng	MSc	Total Capture
Mingyu Ke	MSc	Hand-Object Interaction
Baowen Zhang	MSc	Interacting Two-Hand Shape Reconstruction
Yanguang Wan	MSc	Total Capture
Jiahe Li	MSc	Interacting Two-Hand Shape Reconstruction
Chenyu Meng	MSc	Hand Shape/Pose Estimation

GRADUATED STUDENTS

Name	Degree	Research Topic	First job/Now
Ye Yuan	MSc	Hand Detection	CV researcher, Megvii
Shuo Yang	MSc	Hand Pose Estimation	CV researcher, JD
Yuying Zhu	MSc	Hand Shape Reconstruction	Researcher, ByteDance
Dexin Zuo	MSc	Hand Pose Estimation	Researcher, Weibo
Zeyi Lin	MSc	Hand Gesture Recognition	CV researcher, Huawei
Dachuan Cheng	Intern	Hand Pose Estimation	Researcher, ByteDance
Zhenxin Cheng	Intern	Face Synthesis	CV researcher, Tencent
Wentao Chao	Intern	Face Synthesis	CV researcher, Meitu-> PhD student, BNU
Tongtong Wu	Intern	Recognizing HOI	Researcher, AI Lab of Yuanfudao
Po-Yi Lam	Intern	Hand Shape Fitting	RA, CityU of HK
Zitan Chen	Intern	Shape Reconstruction	Graduate student, CMU, USA
Xin Zhao	Intern	Hand Pose Estimation	PhD student, CSU

PRESS RELEASE

Paralympic Games Booms Rehabilitation Technical Aids, www.people.com.cn, Maintained by People Daily, 2008

TEACHING EXPERIMENCE

Institute of Software, Chinese Academy of Sciences, Beijing, China
Guest Lecturer: Computer Vision November 2013-present

- Ph.D. student course in computer science.
- Lecture: an overview of computer vision, image based modelling, and object recognition

University of Chinese Academy of Sciences, Beijing, China
Lecturer: Computer Vision Based User Interface December 2015, November 2016

- Master student course in computer science
- Lecture: image based modelling, convolutional neural networks in image understanding, motion tracking/synthesis and applications in user interfaces

PROFESSIONAL SERVICE

Committee Service

- Committee, Computer Vision Task Forces Forum, China Computer Federation.

Grant Evaluation

- Panelist of Project Performance Evaluation, Major R&D Programs, Chinese Academy of Sciences, from 2017.
- Panelist of Project Performance Evaluation, NSF of China, from December 2016.
- Panelist, Multimedia Reorganization Projects, National High-Tech R&D Program of China (863 Program), 2014.
- Reviewer, NSF of China, 2012-present.

Journal Reviewer

- *AAS– Acta Automatica Sinica.*
- *CVIU– Computer Vision and Image Understanding.*
- *JCAD– Journal of Computer-Aided Design & Computer Graphics.*
- *JCST– Journal of Computer Science and Technology.*
- *JEI– Journal of Electronic Imaging.*
- *MVA– Machine Vision and Applications.*
- *OE– Optical Engineering.*
- *PR– Pattern Recognition.*
- *PRL– Pattern Recognition Letters.*
- *SIGPRO– Signal Processing.*
- *SMC– IEEE Transactions on Systems, Man and Cybernetics.*
- *TIP– IEEE Transactions on Image Processing.*
- *TOMM– ACM Transactions on Multimedia Computing, Communications, and Applications.*
- *TVC– The Visual Computer.*

Program Committee Member or Reviewer

- *AAAI– AAAI Conference on Artificial Intelligence,2021.*
- *ACCV– Asia Conference on Computer Vision,2014.*
- *APCHI– Asia Pacific Conference on Computer Human Interaction, 2012.*
- *BMVC– British Conference on Computer Vision, 2021.*
- *CCCV– Chinese Conference on Computer Vision, 2015.*
- *CVPR– IEEE/CVF Conference on Computer Vision and Pattern Recognition, 2021, 2022.*
- *Eurographics– Annual Conference of the European Association for Computer Graphics, 2022.*
- *ICPR– International Conference on Pattern Recognition, 2006, 2008, 2012.*
- *IJCAI– International Joint Conference on Artificial Intelligence, 2021, 2022.*
- *IUI– ACM International Conference on Intelligent User Interfaces, 2012.*
- *NIPS– Neural Information Processing Systems, 2016.*
- *SIGCHI– ACM CHI Conference on Human Factors in Computing Systems, 2012.*

- *SIGGRAPH Asia– ACM Conference on Computer Graphics and Interactive Techniques in Asia, 2012.*
- *VRST– ACM Symposium on Virtual Reality Software and Technology, 2019.*
- *WACV– IEEE Winter Applications of Computer Vision Conference, 2015, 2016, 2017.*