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# Weikai Chen

Postdoctoral Researcher, USC ICT

## Positions

**USC Institute for Creative Technologies**, U.S.A
*Postdoctoral Researcher*, Vision and Graphics Lab — Jun. 2017 - Present

**INRIA**, France
*Visiting Researcher*, Alice Team — Jun. 2016 - Aug. 2016

## Education

**The University of Hong Kong**, Hong Kong
- *Ph.D. in Computer Graphics*, advised by Prof. Wenping Wang, — Apr. 2013 - Apr. 2017

**Tianjin University**, Tianjin, China
- *Mphil. in Wireless Communication*, — Sep. 2010 - Feb. 2013
- *B.S. in Electrical Engineering*, — Sep. 2006 - Jul. 2010

## Research Interests

Computer graphics, computer vision and deep learning: face/hair/body modeling and reconstruction, 3D deep learning, deep generative models, unsupervised 3D reconstruction, differentiable rendering, pattern/texture synthesis, digital geometry processing, digital fabrication.

## Publications

[14] Zeng Huang, Tianye Li, Weikai Chen, Yajie Zhao, Jun Xing, Chloe LeGendre, Linjie Luo, Chongyang Ma and Hao Li, "Deep Volumetric Video From Very Sparse Multi-View Performance Capture," *ECCV 2018*.

[13] Yi Zhou, Liwen Hu, Jun Xing, Weikai Chen, Han-Wei Kung, Xin Tong, and Hao Li, "HairNet: Single-View Hair Reconstruction using Convolutional Neural Networks," *ECCV 2018*.

[12] Shugo Yamaguchi, Shunsuke Saito, Koki Nagano, Yajie Zhao, Weikai Chen, Shigeo Morishima and Hao Li., "High-Fidelity Facial Reflectance and Geometry Inference From an Unconstrained Image," *ACM Transactions on Graphics (Proceedings of SIGGRAPH 2018)*.

[11] Loc Huynh, Weikai Chen, Shunsuke Saito, Jun Xing, Koki Nagano, Andrew Jones, Hao Li and Paul Debevec, "Mesoscopic Facial Geometry inference Using Deep Neural Networks," *CVPR 2018* **(Spotlight Presentation)**.

[10] Yajie Zhao, Weikai Chen, Jun Xing, Xiaoming Li, Zach Bessinger, Fuchang Liu, Wangmeng Zuo and Ruigang Yang, "Identity Preserving Face Completion for Large Ocular Region Occlusion," *BMVC 2018*.

[9] Weikai Chen, Xiaoguang Han, Guanbin Li, Chao Chen, Jun Xing, Yajie Zhao and Hao Li, "Deep RBFNet: Point Cloud Feature Learning using Radial Basis Functions ," *Technical Report, 2018*.

[8] Weikai Chen, Yuexin Ma, Sylvain Lefebvre, Shiqing Xin, Jons Martnez and Wenping Wang, "Fabricable Tile Decors," *ACM Transactions on Graphics (Proceedings of SIGGRAPH Asia 2017)*.

[7] Jonathan Palacios, Lawrence Roy, Prashant Kumar, Chen-Yuan Hsu, Weikai Chen, Chongyang Ma, Li-Yi Wei and Eugene Zhang, "Tensor Field Design in Volumes," *ACM Transactions on*

*Graphics (Proceedings of SIGGRAPH Asia 2017).*

[6] Weikai Chen, Xiaolong Zhang, Shiqing Xin, Yang Xia, Sylvain Lefebvre and Wenping Wang, "Synthesis of Filigrees for Digital Fabrication," *ACM Transactions on Graphics (Proceedings of SIGGRAPH 2016).*

[5] Hui Zhang, Weikai Chen, Bin Wang, and Wenping Wang, "By Example Synthesis of Three-Dimensional Porous Materials," *Computer Aided Geometric Design (GMP 2017).*

[4] Jonathan Palacios, Chongyang Ma, Weikai Chen, Li-Yi Wei, and Eugene Zhang, "Tensor Field Design in Volumes," *SIGGRAPH Asia 2016 Technical Briefs*, Dec. 2016.

[3] Weikai Chen, and Yunhui Chen, "Second-order Differential based Matching Pursuit Method for Compressive Sensing Signal Recovery," in *International Conference on Wireless Communications and Signal Processing (WCSP 2012).*

[2] Kaihua Liu, Weikai Chen (corresponding author) and Yongtao Ma, "A compressive sensing method for estimating doubly-selective sparse channels in OFDM system," in *Journal of Tianjin University*, Dec. 2012.

[1] Hao Zhang, Wei Pang, Weikai Chen and Chong Zhou, "Design of unbalanced and balanced radio frequency bulk acoustic wave filter for TD SCDMA," in *International Conference on Microwave and Millimeter Wave Technology (ICMMT 2010).*

## Recent Research Projects

**Unsupervised Single-View Mesh Reconstruction**, Sep. 18 - Present

- Present a highly effective differentiable renderer that can faithfully approximate the standard rasterization based graphics renderer in the forward pass of deep neural network. Based on this renderer, our unsupervised single-view reconstruction approach has achieved comparable results to the supervised counterparts and in various cases even better ones.

**Interactive Facial Hair Editing and Synthesis**, Jun. 2017 - Present

- Users can design facial hairs of different shapes/lengths/densities via simple sketching, while keeping the style of a target facial hair defined by an exemplar image. The framework is powered by Generative Adversarial Network (GAN).

**Point Cloud Feature Learning using Radial Basis Functions**, Mar. 18 - Present

- Present a simple yet effective framework for point set feature learning by leveraging a nonlinear action layer based on Radial Basis Function (RBF) kernels. The proposed approach can explicitly model the spatial distribution of point cloud which leads to a superior performance compared with PointNet++.

**Autocomplete Hair Modeling in VR**, Jun. 17 - Present

- Develop a 3D VR authoring system for immersive interaction with the hair models. Our system combines the flexibility of manual authoring, the convenience of data-driven automation and the power of machine learning for high quality hair modeling.

## Awards

HKU Postgraduate Scholarship, 2013 - 2017
National Scholarship by Ministry of Education, 2012
Champion of Presentation in Joint-Hall Academic Symposium, 2015
Champion of Presentation in 4th Morrison Hall Academic Symposium, 2014
First-Class Postgraduate Scholarship, 2010 - 2013
Huawei Scholarship, 2008
Outstanding Student of Tianjin University, 2006 - 2010

## Teaching

Teaching Assistant, The University of Hong Kong
- COMP7507: Visualization and Visual Analytics 2014 - 2016

Teaching Assistant, The University of Hong Kong
- CS1117A: Computer Programming 2013 - 2014

## Professional Activities

**Program Committee**:

- Computational Visual Media Conference (CVM) 2019
- Pacific Graphics 2018

**Reviewer:**

- CVPR 2019
- ACM SIGGRAPH Asia 2017
- Pacific Graphics 2015, 2018
- ACM Symposium on Virtual Reality Software and Technology 2018
- IEEE Transactions on Visualization and Computer Graphics
- International Conference on 3D Vision 2018
- MVA 2019 (International Conference on Machine Vision Applications)
- 3D Reconstruction in the Wild 2018 (ECCV 2018 Workshop)
- Computer Aided Geometric Design
- The Visual Computer Journal
- Graphical Models
- IEEE Signal Processing Letters

## Computer Skills

**Programming**: C/C++, Matlab, Python, Lua, Mel; OpenGL/CV, Tensorflow, Pytorch, Caffe
**Languages**: Mandarin Chinese (native), English (professional), Cantonese (professional)