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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 and computer vision: face/hair/body modeling and reconstruction, facial texture inference, performance capture, AR/VR content creation, deep generative models, 3D deep learning, pattern/texture synthesis, digital geometry processing, digital fabrication

Publications

[13] 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*.

[12] 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*.

[11] 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*.

[10] 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)*.

[9] 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)**.

[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)*, vol. 36, no. 6, Nov. 2017.

[7] **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)*, vol. 35, no. 4, pp. 98–110, Jun. 2016.

[6] 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), vol. 36, no. 6, Nov. 2017.

[5] Hui Zhang, **Weikai Chen**, Bin Wang, and Wenping Wang, "By Example Synthesis of Three-Dimensional Porous Materials," *Computer Aided Geometric Design (GMP 2017)*, vol. 52, pp. 286–296, Apr. 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)*, Huangshan, China, Oct. 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)*, Chengdu, China, May 2010.

Recent Research Projects

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.

Perspective Undistortion of Unconstrained Portrait Photos, Mar. 18 - Present

- A deep learning based approach to rectify the facial distortion in an unconstrained portrait image shot in a near range. The technique would improve the robustness and accuracy of 3D face reconstruction from a single unconstrained portrait photo.

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:

- ACM SIGGRAPH Asia 2017
- Pacific Graphics 2015, 2018
- IEEE Transactions on Visualization and Computer Graphics
- International Conference on 3D Vision 2018
- 3D Reconstruction in the Wild 2018 (ECCV 2018 Workshop)
- 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)