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Weikai Chen

Research Associate, USC ICT

Positions

USC Institute for Creative Technologies, U.S.A
Research Associate, Vision and Graphics Lab — Jan. 2019 - Present
Postdoctoral Researcher, Vision and Graphics Lab — Jun. 2017 - Jan. 2019

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, computational fabrication.

Publications

[13] Ryota Natsume, Shunsuke Saito, Zeng Huang, *Weikai Chen*, Chongyang Ma, Hao Li, Shigeo Morishima, "SiCloPe: Silhouette-Based Clothed People", *IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**)*, 2019, **Oral**.

[12] 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", *European Conference on Computer Vision **(ECCV)***, 2018.

[11] 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", *European Conference on Computer Vision **(ECCV)***, 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", *IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**)*, 2018, **Spotlight**.

[8] 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", *British Machine Vision Conference **(BMVC)***, 2018.

[7] *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.

[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.

[5] *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.

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

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

[2] *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.

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

Manuscripts

[2] Shichen Liu, *Weikai Chen*, Tianye Li, Hao Li , "Soft Rasterizer: Differentiable Rendering for Unsupervised Single-View Mesh Reconstruction ", arXiv:1901.05567, 2019.

[1] *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", arXiv:1812.04302, 2018.

Recent Research Projects

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

- Present a highly effective differentiable renderer that faithfully approximates the standard graphics renderer in the forward pass of deep neural network. Based on this renderer, we have achieved unsupervised single-view reconstruction with comparable performance to the supervised counterparts.

Interactive Facial Hair Editing and Synthesis, Feb. 2018 - 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).

Perspective Normalization in 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 greatly improves the robustness and accuracy of face recognition and 3D face reconstruction from a single portrait photo.

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.

Professional Activities

Program Committee:

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

Reviewer:

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

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

Skills

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