Weikai Chen

Lead Research Scientist, Tencent US

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Positions

Tencent US, U.S.A
Lead Research Scientist — Mar. 2022 - Present
Senior Research Scientist — Sep. 2019 - Feb. 2022

USC Institute for Creative Technologies, U.S.A
Research Associate, Vision and Graphics Lab — Jan. 2019 - Sep. 2019
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 Electronic Engineering*, — Sep. 2006 - Jul. 2010

Research Interests

Interplay among graphics, vision, and deep learning, especially on human digitization, 3D reconstruction/modeling, differentiable rendering, and neural implicit functions.

Publications

(* indicates equal contribution, # indicates corresponding author)

[32] *Weikai Chen*, Cheng Lin, Weiyang Li, Bo Yang, "3PSDF: Three-Pole Signed Distance Function for Learning Surfaces with Arbitrary Topologies", *IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**)*, 2022.

[31] Haiwei Chen, Jiayi Liu, *Weikai Chen*, Shichen Liu, Yajie Zhao, "Exemplar-based Pattern Synthesis with Implicit Periodic Field Network", *IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**)*, 2022.

[30] Xiaoqian Xu, Pengxu Wei, *Weikai Chen*, Yang Liu, Mingzhi Mao, Liang Lin, Guanbin Li, "Dual Adversarial Adaptation for Cross-Device Real-World Image Super-Resolution", *IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**)*, 2022.

[29] Jia-Heng Tang*, *Weikai Chen**, Jie Yang, Bo Wang, Songrun Liu, Bo Yang, Lin Gao, "OctField: Hierarchical Implicit Functions for 3D Modeling", *Thirty-fifth Conference on Neural Information Processing Systems (**NeurIPS**)*, 2021.

[28] Junkai Huang, Chaowei Fan, *Weikai Chen*, Zhenhua Chai, Xiaolin Wei, Pengxu Wei, Liang Lin, Guanbin Li, "Trash to Treasure: Harvesting OOD Data with Cross-Modal Matching for Open-Set Semi-Supervised Learning", *International Conference on Computer Vision (**ICCV**)*, 2021.

[27] Mingyue Yang, Yuxin Wen, *Weikai Chen*, Yongwei Chen, Kui Jia, "Deep Optimized Priors for 3D Shape Modeling and Reconstruction", *IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**)*, 2021.

[26] Haiwei Chen, Shichen Liu, *Weikai Chen*, Hao Li, "Equivariant Point Network for 3D Point Cloud Analysis", *IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**)*, 2021.

[25] Yuda Qiu, Xiaojie Xu, Linteng Qiu, Yan Pan, Yushuang Wu, *Weikai Chen*, Xiaoguang Han, "3DCaricShop: A Dataset and A Baseline Method for Single-view 3D Caricature Face Reconstruction", *IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**)*, 2021.

[24] Heming Zhu, Yu Cao, Hang Jin, *Weikai Chen*, Dong Du, Zhangye Wang, Shuguang Cui, Xiaoguang Han, "Deep Fashion3D: A Dataset and Benchmark for 3D Garment Reconstruction from Single Images", *European Conference on Computer Vision **(ECCV)***, 2020, **Oral Presentation**.

[23] Shichen Liu, Tianye Li, *Weikai Chen*$^{\#}$, Hao Li, "A General Differentiable Mesh Renderer for Image-based 3D Reasoning", *IEEE Transactions on Pattern Analysis and Machine Intelligence (**TPAMI**)*, 2020.

[22] Kyle Olszewski, Duygu Ceylan, Jun Xing, Jose I. Echevarria, Zhili Chen, *Weikai Chen*, Hao Li, "Intuitive, Interactive Beard and Hair Synthesis with Generative Models", *IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**)*, 2020, **Oral Presentation**.

[21] Lihao Tian, Lin Lu, *Weikai Chen*, Yang Xia, Charlie C. L. Wang and Wenping Wang, "Organic Open-cell Porous Structure Modeling", *ACM Symposium on Computational Fabrication (**ACM SCF**)*, 2020.

[20] Shichen Liu, Shunsuke Saito, *Weikai Chen*$^{\#}$, Hao Li, "Learning to Infer Implicit Surfaces without 3D Supervision", *Neural Information Processing Systems (**NeurIPS**)*, 2019.

[19] Shichen Liu, Tianye Li, *Weikai Chen*, Hao Li, "Soft Rasterizer: A Differentiable Renderer for Image-based 3D Reasoning", *International Conference on Computer Vision (**ICCV**)*, 2019, **Oral Presentation**. – **Accepted with 3 Strong Accepts**

[18] Yajie Zhao, Zeng Huang, Tianye Li, *Weikai Chen*, Chloe LeGendre, Xinglei Ren, Ari Shapiro, Hao Li, "Learning Perspective Undistortion of Portraits ", *International Conference on Computer Vision (**ICCV**)*, 2019, **Oral Presentation**.

[17] Junyi Pan, Xiaoguang Han, *Weikai Chen*, Jiapeng Tang, Kui Jia, "Deep Mesh Reconstruction from Single RGB Images via Topology Modification Networks", *International Conference on Computer Vision (**ICCV**)*, 2019.

[16] Jun Xing, Koki Nagano, *Weikai Chen*, Haotian Xu, Li-Yi Wei, Jingwan Lu, Byungmoon Kim, Yajie Zhao, Hao Li, "HairBrush for Immersive Data-Driven Hair Modeling", *ACM Symposium on User Interface Software and Technology (**UIST**)*, 2019.

[15] 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 Presentation** – **CVPR Best Paper Finalists**.

[14] Yajie Zhao, Qingguo Xu, *Weikai Chen*, Jun Xing, Chao Du, Xinyu Huang, Ruigang Yang, "Mask-off: Synthesizing Face Images in the Presence of Head-mounted Displays", *IEEE Conference on Virtual Reality and 3D User Interfaces (**IEEE VR**)*, 2019.

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

[11] 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)*.

[10] 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**.

[9] 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.

[8] *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.

[7] *Weikai Chen*, Yuexin Ma, Sylvain Lefebvre, Shiqing Xin, Jonàs Martínez 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*$^{\#}$ and Yongtao Ma, "A compressive sensing method for estimating doubly-selective sparse channels in OFDM system", *Journal of Tianjin University*, Dec. 2012.

Patents

[3] *Weikai Chen*, Weiyang Li, Bo Yang, "3PSDF: Three-Pole Signed Distance Function for Learning Surfaces with Arbitrary Topologies", *031384-7277-US*, Pending.

[2] *Weikai Chen*, Bo Wang, Songrun Liu, Bo Yang, "OctField: Hierarchical implicit representation for 3D modeling", *031384-7120-US*, Pending.

[1] Bo Wang, *Weikai Chen*, Bo Wang, Bo Yang, Songrun Liu, "Contrastive Point Completion with Fine-to-Coarse Refinement", *031384-7121-US*, Pending.

Selected Awards

CVPR Best Paper Finalist	2019
Outstanding Contributor (top 5% performance) - Tencent	2021
Second Place (top 10%) of Tencent IEG Innovation Competition - Tencent	2021
Best Open-source Dataset Award (Deep Fashion3D) - China Computer Fedaration	2020
ACCV Outstanding Reviewer	2020
National Scholarship by Ministry of Education (top 0.1%)	2012
Huawei Scholarship	2008
Outstanding Student of Tianjin University	2006 - 2010

Professional Activities

Guest Editor:

- Frontiers in Virtual Reality

Senior Program Committee:

- IJCAI 2021

Program Committee:

- IJCAI-ECAI 2022
- AAAI 2020, 2021
- Computational Visual Media Conference (CVM) 2019, 2020, 2021
- IEEE Artificial Intelligence & Virtual Reality (AIVR) 2019, 2020
- Pacific Graphics 2018

Reviewer:

- Conference
  - ICML 2021, 2022
  - ICLR 2021
  - CVPR 2019 - 2022
  - NeurIPS 2020, 2021
  - ECCV 2020, 2022
  - ICCV 2019, 2021
  - SIGGRAPH 2021, 2022
  - SIGGRAPH Asia 2017, 2019
  - WACV 2020
  - ACCV 2020
  - International Conference on 3D Vision (3DV) 2018
  - Pacific Graphics 2015, 2018
  - ACM Symposium on Virtual Reality Software and Technology 2018
  - International Conference on Machine Vision Applications (MVA) 2019
- Journal
  - IEEE Transactions on Visualization and Computer Graphics
  - NeuroComputing
  - Computer Graphics Forum
  - Computer Aided Geometric Design
  - The Visual Computer Journal
  - Graphical Models
  - Journal of Visual Communication and Image Representation