

# Weikai Chen

PRINCIPAL RESEARCH SCIENTIST, TENCENT AMERICA

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## BACKGROUND HIGHLIGHTS

- Expert in the field of **AIGC**, **3D Vision**, and **Computer Graphics**, including diffusion model, GAN, 3D generative model, 3D reconstruction/modeling, neural/differentiable rendering, explicit/implicit 3D representation, etc.
- Published **over 45 papers** in top computer vision, computer graphics, and machine learning journals and conferences, such as TPAMI, SIGGRAPH, CVPR, ICCV, ECCV, NeurIPS with about **2.8K citation**.
- Co-author of **SoftRas**, which is **adopted by Pytorch3D** as the de-facto algorithm for differential rendering.
- Serve as Program Committee or Reviewer for more than 30 journals and conferences, including TPAMI, TVCG, SIGGRAPH, CVPR, ICCV, ECCV, NeurIPS, AAAI, etc.

## POSITIONS

<b>Tencent America</b> , U.S.A <i>Principal Research Scientist</i> <i>Lead Research Scientist</i> <i>Senior Research Scientist</i>	Apr. 2024 - Present Mar. 2022 - Apr. 2024 Sep. 2019 - Feb. 2022
<b>USC Institute for Creative Technologies</b> , U.S.A <i>Research Associate</i> , Vision and Graphics Lab <i>Postdoctoral Researcher</i> , Vision and Graphics Lab	Jan. 2019 - Sep. 2019 Jun. 2017 - Jan. 2019
<b>INRIA</b> , France <i>Visiting Researcher</i> , Alice Team	Jun. 2016 - Aug. 2016

## EDUCATION

<b>The University of Hong Kong</b> , Hong Kong - <i>Ph.D. in Computer Graphics</i> , advised by Prof. Wenping Wang,	Apr. 2013 - Apr. 2017
<b>Tianjin University</b> , Tianjin, China - <i>Mphil. in Wireless Communication</i> , - <i>B.S. in Electronic Engineering</i> ,	Sep. 2010 - Feb. 2013 Sep. 2006 - Jul. 2010

## PUBLICATIONS

- (\* indicates equal contribution, # indicates corresponding author)
- [47] Yu-Tao Liu, Xuan Gao, *Weikai Chen*, Jie Yang, Xiaoxu Meng, Bo Yang, Lin Gao, “DreamUDF: Generating Unsigned Distance Fields from A Single Image”, *ACM Transactions on Graphics (Proceedings of SIGGRAPH Asia)*, 2024.
- [46] Zhongjin Luo, Haolin Liu, Chenghong Li, Wanghao Du, Zirong Jin, Wanhui Sun, Yinyu Nie, *Weikai Chen*, Xiaoguang Han, “GarVerseLOD: High-Fidelity 3D Garment Reconstruction from a Single In-the-Wild Image using a Dataset with Levels of Details”, *ACM Transactions on Graphics (Proceedings of SIGGRAPH Asia)*, 2024.

- [45] Li Wang, Yu-Tao Liu, Jie Yang, *Weikai Chen*, Xiaoxu Meng, Bo Yang, Jintao Li, Lin Gao, “HSDF: Hybrid Sign and Distance Field for Neural Representation of Surfaces with Arbitrary Topologies”, *IEEE Transactions on Visualization and Computer Graphics (TVCG)*, 2024.
- [44] Ganlong Zhao, Guanbin Li, *Weikai Chen*, Yizhou Yu, “OVER-NAV: Elevating Iterative Vision-and-Language Navigation with Open-Vocabulary Detection and StructurEd Representation”, *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2024.
- [43] Guanbin Li, Ricong Huang, Haofeng Li, Zunzhi You, *Weikai Chen*, “SENSE: Self-Evolving Learning for Self-Supervised Monocular Depth Estimation”, *IEEE Transactions on Image Processing (TIP)*, 2023.
- [42] Yu-Tao Liu, Li Wang, Jie Yang, *Weikai Chen*, Xiaoxu Meng, Bo Yang, Lin Gao\*, “NeUDF: Learning Neural Unsigned Distance Fields with Volume Rendering”, *IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)*, 2023.
- [41] Zhangyang Xiong, Di Kang, Derong Jin, *Weikai Chen*, Linchao Bao, Shuguang Cui, Xiaoguang Han, “Get3DHuman: Lifting StyleGAN-Human into a 3D Generative Model using Pixel-aligned Reconstruction Priors”, *International Conference on Computer Vision (ICCV)*, 2023.
- [40] Ziyi Zhang, *Weikai Chen*, Chaowei Fang, Zhen Li, Lechao Chen, Liang Lin, Guanbin Li, “RankMatch: Fostering Confidence and Consistency in Learning with Noisy Labels”, *International Conference on Computer Vision (ICCV)*, 2023.
- [39] Xiaoxu Meng, *Weikai Chen*, Bo Yang, “NeAT: Learning Neural Implicit Surfaces with Arbitrary Topologies from Multi-view Images”, *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2023
- [38] Yu-Tao Liu, Li Wang, Jie Yang, *Weikai Chen*, Xiaoxu Meng, Bo Yang, Lin Gao, “NeUDF: Learning Neural Unsigned Distance Fields with Volume Rendering”, *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2023.
- [37] DuoJun Huang, Jichang Li, *Weikai Chen*, Junshi Huang, Zhenhua Chai, Guanbin Li, “Divide and Adapt: Active Domain Adaptation via Customized Learning”, *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2023, **Highlight Presentation**.
- [36] Xiangyu Zhu, Dong Du, *Weikai Chen*, Zhiyou Zhao, Yinyu Nie, Xiaoguang Han, “NerVE: Neural Volumetric Edges for Parametric Curve Extraction from Point Cloud”, *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2023.
- [35] Lan Chen, Jie Yang, Hongbo Fu, Xiaoxu Meng, *Weikai Chen*, Bo Yang, Lin Gao, “ImplicitPCA: Implicitly-Proxied Parametric Encoding for Collision-Aware Garment Reconstruction”, **Graphical models** (Computational Visual Media Conference), 2023.
- [34] Li Wang, Jie Yang, *Weikai Chen*, Xiaoxu Meng, Bo Yang, Jintao Li, Lin Gao, “HSDF: Hybrid Sign and Distance Field for Modeling Surfaces with Arbitrary Topologies”, *Neural Information Processing Systems (NeurIPS)*, 2022.
- [33] Ziyi Zhang, *Weikai Chen*, Hui Cheng, Zhen Li, Siyuan Li, Liang Lin, Guanbin Li, “Divide and Contrast: Source-free Domain Adaptation via Adaptive Contrastive Learning”, *Neural Information Processing Systems (NeurIPS)*, 2022.
- [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*<sup>#</sup>, 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*<sup>#</sup>, 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**. – **Adopted by Pytorch3D as its core algorithm for differentiable rendering**

[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*<sup>#</sup> and Yongtao Ma, “A compressive sensing method for estimating doubly-selective sparse channels in OFDM system”, *Journal of Tianjin University*, Dec. 2012.

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## SELECTED PATENTS

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

[3] Lan Chen, Jie Yang, Zechao Yang, Lin Gao, Xiaoxu Meng, *Weikai Chen*, Bo Yang, “Implicitly-Proxied Parametric Encoding for Collision-Aware Garment Reconstruction”, *2023020047CN*, 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”, *Patent #11810250*, Granted.

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## SELECTED AWARDS

CVPR Best Paper Finalist	2019
Outstanding Contributor - Tencent	2021, 2023
Second Place (top 10%) of Tencent IEG Innovation Competition - Tencent	2021
Best Open-source Dataset Award (Deep Fashion3D) - China Computer Federation	2020
ACCV Outstanding Reviewer	2020
National Scholarship by Ministry of Education (top 1%)	2012
Huawei Scholarship	2008
Outstanding Student of Tianjin University	2006 - 2010

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## PROFESSIONAL ACTIVITIES

### Guest Editor:

- Frontiers in Virtual Reality

### Senior Program Committee:

- IJCAI 2021

### Reviewer:

- Conference: all top conferences in the fields of computer vision, computer graphics, and machine learning, e.g. CVPR/ICCV/ECCV, SIGGRAPH/SIGGRAPH Asia, NeurIPS/ICML, etc.
- Journal: all top journals in computer vision and computer graphics, e.g. IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI), IEEE Transactions on Visualization and Computer Graphics (TVCG), etc.