

YINYU NIE

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Noah's Ark Lab, Huawei (UK)

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EDUCATION

Bournemouth University, U.K.

January 2017 - April 2021

PhD, 3D computer vision, Scene understanding.

Thesis: "Holistic Indoor Scene Understanding, Modelling and Reconstruction from Single Images".

National Centre for Computer Animation, Faculty of Media and Communication.

Southwest Jiaotong University, China.

September 2014 - December 2016

MEng, Vehicle system dynamics, Image-based vehicle body modelling.

Thesis: "Data-driven simulation framework for railway vehicle dynamics".

State Key Laboratory of Traction Power.

Southwest Jiaotong University, China.

September 2010 - June 2014

BSc, Statistics.

School of Mathematics.

RESEARCH INTERESTS

3D Computer Vision and Graphics including: **1)** 3D scene analysis, understanding and reconstruction; **2)** 3D shape analysis, representation and reconstruction; **3)** Human-scene interaction; **4)** Medical image/video analysis.

RESEARCH EXPERIENCE

Noah's Ark Lab, Huawei (UK)

October 2023 - Present

Research Scientist in 3D Computer Vision

Technical University of Munich, Germany

April 2021 - October 2023

Post-doctoral researcher with Prof. Matthias Nießner

National Centre for Computer Animation, U.K.

January 2017 - April 2021

PhD researcher

Topics: Content-aware indoor scene understanding and modeling.

Supervisors: Jian Chang, Jian J Zhang.

The Chinese University of Hong Kong (Shenzhen), China

August 2019 - December 2020

Visiting PhD researcher

Topics: 3D scene understanding and reconstruction.

Project Instructor: Xiaoguang Han.

State Key Laboratory of Traction Power, China.

September 2013 - December 2016

Postgraduate researcher

Topics: Photo-based 3D modelling of train accident scenes; Data-driven vehicle dynamics simulation.

Supervisor: Zhao Tang.

SKILLS

Proficient in deep learning / machine learning techniques in computer vision and graphics with related programming languages and tools.

Programming: Python, C/C++, HTML, \LaTeX , Mathematica, Matlab

Tools: Pytorch, Tensorflow, Blender, OpenCV, VTK.

PROFESSIONAL SERVICES

Conference Reviewer: CVPR'22-24, ECCV'22-24, ICCV'23, NeurIPS'23, 3DV'22-24, ICML'24, ICLR'24, SIGGRAPH'24

Journal Reviewer: TPAMI, TVCG, CGF, ISPRS, Computers & Graphics

Program Committee: CASA'20 - Present

TEACHING

Teaching Assistant: Advanced Deep Learning for Computer Vision, 2021-Present, TU Munich.

AWARDS & HONORS

02/2023 IJCARS 2021 Best Paper Award, 2nd Prize

07/2022 CASA 2022 AniNex Workshop, Best Paper Award, 2nd Prize

06/2020 CVPR 2020 Paper Award nominee (selection rate \approx 0.4%)

05/2018 CASA 2018 Best Paper Award, 1st Prize

TALKS

07/2024 On the Boundary of 3D Asset Reconstruction and Generation

Invited talk by Dr. Xiaofei Wu, Huawei Noah's Ark Lab, Shenzhen

11/2023 3D Data Structures and AI

Invited lecture by Dr. Wenshu Zhang, University of the Arts London, London, UK

11/2023 Self-supervised 3D Reconstruction

Invited talk by Dr. Xiaofei Wu, Noah's Ark Lab, Huawei, London, UK

09/2023 Towards Self-supervised 3D Scene Understanding and Reconstruction

Invited talk by Dr. Xiaoguang Han, The Chinese University of Hong Kong (Shenzhen), China

09/2023 3D Scene Understanding, Reconstruction and Generation

Invited talk by Dr. Qian Yu, Beihang University, Beijing, China

06/2023 Learning 3D Scene Priors with 2D Supervision

Poster Presentation, CVPR 2023, Vancouver, Canada

12/2022 3D Shape Reconstruction from Different Modalities

Invited talk by Dr. Kai Zhang, Southwest Jiaotong University, Chengdu, China

11/2022 3D Indoor Scene Understanding from Different Modalities

Invited talk by Dr. Shihui Guo, Xiamen University, Xiamen, China

10/2022 Pose2Room: Understanding 3D Scenes from Human Activities

Poster Presentation, ECCV 2022, Tel-Aviv, Israel

04/2022 Holistic 3D Scene Understanding from Images, Point Clouds and Human Activities

Invited talk, HiGraphics Workshop 2022, Hirschegg, Austria

06/2021 RfD-Net: Point Scene Understanding by Semantic Instance Reconstruction

Poster Presentation, CVPR 2021, Virtual

12/2020 Skeleton-bridged Point Completion: From Global Inference to Local Adjustment

Poster Presentation, NeurIPS 2020, Virtual

06/2020 Total3DUnderstanding: Joint Layout, Object Pose and Mesh Reconstruction for Indoor Scenes from a Single Image

Oral Presentation, CVPR 2020, Virtual

05/2018 Semantic Modelling of Indoor Scenes with Support Inference from a Single Photograph

Oral Presentation, CASA 2018, Beijing, China

SELECTED PUBLICATIONS

Luo, Z., Liu, H., Li, C., Du, W., Jin, Z., Sun, W., **Nie, Y.**, Chen, W. and Han, X., 2024. GarVerseLOD: High-Fidelity 3D Garment Reconstruction from a Single In-the-Wild Image using a Dataset with Levels of Details. arXiv preprint arXiv:2411.03047. (SIGGRAPH Asia 2024, Journal Track)

Chen, Y., **Nie, Y.**, Ummenhofer, B., Birkel, R., Paulitsch, M., Müller, M. and Nießner, M., 2024. Mesh2NeRF: Direct Mesh Supervision for Neural Radiance Field Representation and Generation. arXiv preprint arXiv:2403.19319. (ECCV 2024)

Dhamo, H., **Nie, Y.**, Moreau, A., Song, J., Shaw, R., Zhou, Y. and Pérez-Pellitero, E., 2023. Headgas: Real-time animatable head avatars via 3d gaussian splatting. arXiv preprint arXiv:2312.02902. (ECCV 2024)

Liu, H., Ye, C., **Nie, Y.**, He, Y. and Han, X., 2023. LASA: Instance Reconstruction from Real Scans using A Large-scale Aligned Shape Annotation Dataset. arXiv preprint arXiv:2312.12418. (CVPR 2024)

Tang, J., Dai, A., **Nie, Y.**, Markhasin, L., Thies, J. and Niessner, M., 2023. DPHMs: Diffusion Parametric Head Models for Depth-based Tracking. arXiv preprint arXiv:2312.01068. (CVPR 2024)

Tang, J., **Nie, Y.**, Markhasin, L., Dai, A., Thies, J. and Nießner, M., 2023. DiffuScene: Scene Graph Denoising Diffusion Probabilistic Model for Generative Indoor Scene Synthesis. arXiv preprint arXiv:2303.14207. (CVPR 2024)

Nie, Y., Dai, A., Han, X., Nießner, M., 2023. Learning 3D Scene Priors with 2D Supervision. (CVPR 2023)

Zhu X., Du, D., Chen, W., Zhao, Z., **Nie, Y.**, Han, X., 2023. NerVE: Neural Volumetric Edges for Parametric Edge Curve Extraction from Point Cloud. (CVPR 2023)

Rao, Y., **Nie, Y.**, Dai, A., 2022. PatchComplete: Learning Multi-Resolution Patch Priors for 3D Shape Completion on Unseen Categories. (NeurIPS 2022)

Nie, Y., Dai, A., Han, X. and Nießner, M., 2022. Pose2Room: Understanding 3D Scenes from Human Activities. (ECCV 2022)

Zhang, J., **Nie, Y.**, Chang, J. and Zhang, J.J., 2021. SIG-Former: Monocular Surgical Instruction Generation with Transformers. (IJCARs 2021 **Best Paper Award, 2nd Prize**)

Gong, B., **Nie, Y.**, Lin, Y., Han, X. and Yu, Y., 2021. ME-PCN: Point Completion Conditioned on Mask Emptiness. (ICCV 2021)

Zhang, J., **Nie, Y.**, Chang, J. and Zhang, J.J., 2021. Surgical Instruction Generation with Transformers. (MICCAI 2021 **Oral**)

Nie, Y., Hou, J., Han, X. and Nießner, M., 2020. RfD-Net: Point Scene Understanding by Semantic Instance Reconstruction. (CVPR 2021)

Nie, Y., Han, X., Lin, Y., Guo, S., Chang, J., Cui, S. and Zhang, J.J., 2020. Skeleton-bridged Point Completion: From Global Inference to Local Adjustment. (NeurIPS 2020)

- Du, D., Zhu, H., **Nie, Y.**, Han, X., Cui, S., Yu, Y., Liu, L., 2020. Learning Part Generation and Assembly for Sketching Man-Made Objects. (Computer Graphics Forum)
- Nie, Y.**, Han, X., Guo, S., Zheng, Y., Chang, J. and Zhang, J.J., 2020. Total3DUnderstanding: Joint Layout, Object Pose and Mesh Reconstruction for Indoor Scenes from a Single Image. arXiv preprint arXiv:2002.12212. (CVPR2020 **Oral, Paper Award nominee**)
- Zhang, J., **Nie, Y.**, Lyu, Y., Li, H., Chang, J., Yang, X., Zhang, J.J., 2020. Symmetric Dilated Convolution for Surgical Gesture Recognition. arXiv preprint arXiv:2007.06373. (MICCAI 2020 **Oral, Student Travel Award**)
- Nie, Y.**, Guo, S., Chang, J., Han, X., Huang, J., Hu, S.M. and Zhang, J.J., 2020. Shallow2Deep: Indoor scene modeling by single image understanding. Pattern Recognition, 103, p.107271.
- Nie, Y.**, Chang, J., Chaudhry, E., Guo, S., Smart, A. and Zhang, J.J., 2018. Semantic modeling of indoor scenes with support inference from a single photograph. Computer Animation and Virtual Worlds, 29(3-4), p.e1825. (CASA2018, **Best Paper Award**)

REFERENCES

Prof. Dr. Matthias Nießner

Professor, CS, TUM
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Prof. Dr. Angela Dai

Professor, CS, TUM
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Prof. Dr. Xiaoguang Han

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Prof. Dr. Jian Chang

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Prof. Dr. Jian J Zhang

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