YINYU NIE

Website Google Scholar Github Twitter
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≈0.4%)
05/2018 CASA 2018 Best Paper Award, 1st Prize

TALKS

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

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
Professor, CS, CUHK,SZ
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Prof. Dr. Jian Chang
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Prof. Dr. Jian J Zhang
Professor, CS, BU
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