

# YINYU NIE

Website: <https://yinyunie.github.io/>

Visual Computing Lab, Department of Informatics, Technical University of Munich

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## EDUCATION

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**Bournemouth University, U.K.**

*January 2017 - April 2021*

**PhD**, Scene understanding and reconstruction, 3D shape analysis.

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, Photo-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

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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

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**Technical University of Munich, Germany**

*April 2021 - Present*

Post-doctoral researcher with Prof. Matthias Niessner

**National Centre for Computer Animation, U.K.**

*January 2017 - April 2021*

Postgraduate 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.

Supervisors: Jian J Zhang, Zhao Tang.

## SKILLS

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

**Programming:** Python, C/C++, HTML, L<sup>A</sup>T<sub>E</sub>X, Mathematica, Matlab

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

## PROFESSIONAL SERVICES

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**Conference Reviewer:** CVPR'22-23, ECCV'22, ICCV'23, NeurIPS'23, 3DV'22

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

**Program Committee:** CASA'20 - Present

## TEACHING

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

## AWARDS & HONORS

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

**2021** IJCARS Best Paper Award, 2nd Prize

**06/2020** CVPR 2020 Paper Award nominee

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

## TALKS

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

Poster Presentation, CVPR 2023, Vancouver, Canada

**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

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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. (arXiv 2023 preprint)

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  
niessner@tum.de

**Prof. Dr. Jian Chang**

Professor, CS, BU  
jchang@bournemouth.ac.uk

**Prof. Dr. Angela Dai**

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**Prof. Dr. Jian J Zhang**

Professor, CS, BU  
jzhang@bournemouth.ac.uk

**Prof. Dr. Xiaoguang Han**

Professor, CS, CUHK,SZ  
hanxiaoguang@cuhk.edu.cn