Xieyuanli **Chen**

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Research Interests

Main Research Areas: SLAM, Robot Perception, Scene Understanding, Robot Learning
Applications: Mobile Robots; Autonomous Vehicles; Rescue Robots

Education

Dr.-Ing. (Ph.D. in Engineering) - *summa cum laude* (with distinction, best possible grade)   *09.2018 - 08.2022*
University of Bonn, SUPERVISOR: Prof. Dr. Cyrill Stachniss   *Bonn, Germany*
THESIS: LiDAR-Based Semantic Perception for Autonomous Vehicles

M.S. in Robotics   *09.2015 - 12.2017*
National University of Defense Technology, SUPERVISOR: Prof. Dr. Hui Zhang   *Hunan, China*
THESIS: Binary Visual Feature-based Monocular SLAM

B.S. in Electrical Engineering and Automation   *09.2011 - 07.2015*
Hunan University, SUPERVISOR: Prof. Dr. Jianhao Tan   *Hunan, China*
THESIS: Control for a Quadrotor UVA

Research Experience

ACADEMIC WORKING EXPERIENCE

Associate Professor   *12.2022 - Present*
National University of Defense Technology

Research Assistant   *09.2019 - 09.2022*
University of Bonn

RESEARCH COMMITTEE MEMBERSHIP

Associate Editor   *09.2022 - Present*
IEEE Robotics and Automation Letters (RA-L)

Associate Editor   *2023, 2024, 2025*
IEEE Intl. Conf. on Robotics & Automation (ICRA)

Associate Editor   *2023, 2024*
IEEE/RSJ Intl. Conf. on Intelligent Robots & Systems (IROS)

Technical Committee   *07.2019 - 07.2023*
RoboCup Rescue Robot League

Research Projects

Young Elite Scientists Sponsorship Program   *2023-2025*
Robot Perception and Navigation in Complex and Dynamic Environments   CAST

Young Scientists Fund of the National Natural Science Foundation of China   *2024-2026*
Semantic Scene Graph-Based SLAM for Robots in Open World   NSFC

Research Indices

GoogleScholar · h-index: 32 · i10-index: 51 · Number of citations: 3900+   *04.2025*
All indices determined using GoogleScholar with ID DvrngV4AAAAJ

GitHub · open-source projects: 30+ · stars: 6000+ · forks: 1500+   *04.2025*
All indices determined using GitHub with repositories contributed by ID Chen-Xieyuanli

Honors & Awards

World's Top 2% Scientists *2024*
Stanford and Elsevier

Summa cum laude (Doctoral degree with distinction, best possible grade) *2022*
University of Bonn

RSS Pioneer *2021*
Robotics: Science and Systems (RSS)

Finalist of Best System Paper *2020*
Robotics: Science and Systems (RSS)

Finalist of Best Paper in Robot Learning *2024*
IEEE International Conference on Robotics and Biomimetics (ROBIO)

Best-in-Class in Rescue Robot League *2021, 2022, 2023*
Rescue Robot League (RRL), RoboCup

Publication List

Selected papers of those where I am the **first, equal-contributed*, or corresponding**[†] **author**.

[1] C. Shi, **X. Chen***, J. Xiao, B. Dai, and H. Lu. Fast and accurate deep loop closing and relocalization for reliable lidar slam. *IEEE Transactions on Robotics (TRO)*, 2024

[2] L. Luo, S.Y. Cao, X. Li, J. Xu, R. Ai, Z. Yu, and **X. Chen**[†]. Bevplace++: Fast, robust, and lightweight lidar global localization for unmanned ground vehicles. *IEEE Trans. on Robotics (TRO)*, 2024 (revise&resubmit)

[3] **X. Chen**, J. Cui, Y. Liu, X. Zhang, J. Sun, R. Ai, W. Gu, J. Xu, and H. Lu. Joint scene flow estimation and moving object segmentation on rotational lidar data. *IEEE Transactions on Intelligent Transportation Systems (TITS)*, 2024

[4] J. Ma, G. Xiong, J. Xu, and **X. Chen**[†]. CVTNet: A Cross-View Transformer Network for LiDAR-Based Place Recognition in Autonomous Driving Environments. *IEEE Trans. on Industrial Informatics (TII)*, 2023

[5] C. Liu, H. Yu, P. Cheng, W. Sun, J. Civera, and **X. Chen***. Pe-vins: Accurate monocular visual-inertial slam with point-edge features. *IEEE Transactions on Intelligent Vehicles (TIV)*, 2024

[6] **X. Chen**, T. Läbe, A. Milioto, T. Röhling, J. Behley, and C. Stachniss. OverlapNet: A Siamese Network for Computing LiDAR Scan Similarity with Applications to Loop Closing and Localization. *Autonomous Robots*, 46:61–81, 2021

[7] **X. Chen**, B. Mersch, L. Nunes, R. Marcuzzi, I. Vizzo, J. Behley, and C. Stachniss. Automatic Labeling to Generate Training Data for Online LiDAR-Based Moving Object Segmentation. *IEEE Robotics and Automation Letters (RA-L)*, 7(3):6107–6114, 2022

[8] **X. Chen**, S. Li, B. Mersch, L. Wiesmann, J. Gall, J. Behley, and C. Stachniss. Moving Object Segmentation in 3D LiDAR Data: A Learning-based Approach Exploiting Sequential Data. *IEEE Robotics and Automation Letters (RA-L)*, 6:6529–6536, 2021

[9] L. Nunes, **X. Chen**[†], R. Marcuzzi, A. Osep, L. Leal-Taixé, C. Stachniss, and J. Behley. Unsupervised Class-Agnostic Instance Segmentation in LiDAR Data for Autonomous Vehicles. *IEEE Robotics and Automation Letters (RA-L)*, 2022

[10] J. Ma, J. Zhang, J. Xu, R. Ai, W. Gu, and **X. Chen**[†]. OverlapTransformer: An Efficient and Rotation-Invariant Transformer Network for LiDAR-Based Place Recognition. *IEEE Robotics and Automation Letters (RA-L)*, 2022

[11] J. Cui and **X. Chen**[†]. CCL: Continual Contrastive Learning for LiDAR Place Recognition. *IEEE Robotics and Automation Letters (RA-L)*, 8(8):4433–4440, 2023

[12] N. Wang, **X. Chen**[†], C. Shi, Z. Zheng, H. Yu, and H. Lu. Sglc: Semantic graph-guided coarse-fine-refine full loop closing for lidar slam. *IEEE Robotics and Automation Letters (RA-L)*, 2024

[13] Y. Wang, C. Jiang, and **X. Chen**[†]. Goreloc: Graph-based object-level relocalization for visual slam. *IEEE Robotics and Automation Letters (RA-L)*, 2024

[14] **X. Chen**, T. Läbe, A. Milioto, T. Röhling, O. Vysotska, A. Haag, J. Behley, and C. Stachniss. OverlapNet: Loop Closing for LiDAR-based SLAM. In *Proc. of Robotics: Science and Systems (RSS)*, 2020

[15] **X. Chen**, I. Vizzo, T. Läbe, J. Behley, and C. Stachniss. Range Image-based LiDAR Localization for Autonomous Vehicles. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2021

[16] H. Dong, **X. Chen**[†], M. Dusmanu, V. Larsson, M. Pollefeys, and C. Stachniss. Learning-based dimensionality reduction for local feature descriptors. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2023

[17] K. Luan, C. Shi, N. Wang, Y. Cheng, H. Lu, and **X. Chen**[†]. Diffusion-based point cloud super-resolution for mmwave radar data. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2024

[18] Y. Shen, M. Liu, H. Lu, and **X. Chen**[†]. Tscm: A teacher-student model for vision place recognition using cross-metric knowledge distillation. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2024

[19] Y. Wang, C. Jiang, and **X. Chen**[†]. Voom: Robust visual object odometry and mapping using hierarchical landmarks. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2024

[20] H. Dong, W. Gu, X. Zhang, J. Xu, R. Ai, H. Lu, J. Kannala, and **X. Chen**[†]. Superfusion: Multilevel lidar-camera fusion for long-range hd map generation. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2024

[21] **X. Chen**, A. Milioto, E. Palazzolo, P. Giguère, J. Behley, and C. Stachniss. SuMa++: Efficient LiDAR-based Semantic SLAM. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, 2019

[22] **X. Chen**, T. Läbe, L. Nardi, J. Behley, and C. Stachniss. Learning an Overlap-based Observation Model for 3D LiDAR Localization. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, 2020

[23] J. Sun, Y. Wang, M. Feng, D. Wang, J. Zhao, C. Stachniss, and **X. Chen**[†]. ICK-Track: A Category-Level 6-DoF Pose Tracker Using Inter-Frame Consistent Keypoints for Aerial Manipulation. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, 2022

[24] N. Wang, C. Shi, R. Guo, H. Lu, Z. Zheng, and **X. Chen**[†]. Insmos: Instance-aware moving object segmentation in lidar data. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, 2023

[25] W. Deng, K. Huang, Q. Yu, H. Lu, Z. Zheng, and **X. Chen**[†]. Elc-ois: Ellipsoidal clustering for open-world instance segmentation on lidar data. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, 2023

[26] W. Xie, L. Luo, N. Ye, Y. Ren, S. Du, M. Wang, J. Xu, R. Ai, W. Gu, and **X. Chen**[†]. Modalink: Unifying modalities for efficient image-to-pointcloud place recognition. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, 2024

[27] Z. Tan, Z. Zhou, Y. Ge, Z. Wang, **X. Chen**[†], and D. Hu. Td-nerf: Novel truncated depth prior for joint camera pose and neural radiance field optimization. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, 2024

[28] J. Ma, **X. Chen***, J. Huang, J. Xu, Z. Luo, J. Xu, W. Gu, R. Ai, and H. Wang. Cam4docc: Benchmark for camera-only 4d occupancy forecasting in autonomous driving applications. In *Proc. of the IEEE/CVF Conf. on Computer Vision and Pattern Recognition (CVPR)*, 2024

[29] J. Xu, **X. Chen***, J. Ma, J. Huang, J. Xu, Y. Wang, and L. Pei. Spatiotemporal decoupling for efficient vision-based occupancy forecasting. In *Proc. of the IEEE/CVF Conf. on Computer Vision and Pattern Recognition (CVPR)*, 2025

[30] J. Deng, **X. Chen**[†], S. Xia, Z. Sun, G. Liu, W. Yu, and L. Pei. Nerf-loam: Neural implicit representation for large-scale incremental lidar odometry and mapping. In *Proc. of the IEEE/CVF Intl. Conf. on Computer Vision (ICCV)*, 2023

[31] C. Pang, **X. Chen***, Y. Liu, H. Lu, and Y. Cheng. Radarmoseve: A spatial-temporal transformer network for radar-only moving object segmentation and ego-velocity estimation. In *Proc. of the Conference on Advancements of Artificial Intelligence (AAAI)*, 2024

Selected cooperation papers

[1] Y. Bai, Q. Zou, **X. Chen**, L. Li, Z. Ding, and L. Chen. Extreme low-resolution action recognition with confident spatial-temporal attention transfer. *Intl. Journal of Computer Vision (IJCV)*, pages 1–16, 2023

[2] H. Yin, X. Xu, S. Lu, **X. Chen**, R. Xiong, S. Shen, C. Stachniss, and Y. Wang. A survey on global lidar localization: Challenges, advances and open problems. *Intl. Journal of Computer Vision (IJCV)*, pages 1–33, 2024

[3] S. Lu, X. Xu, Y. Wu, H. Lu, **X. Chen**, R. Xiong, and Y. Wang. Ring#: Pr-by-pe global localization with roto-translation equivariant gram learning. *IEEE Trans. on Robotics (TRO)*, 2024

[4] C. Shi, **X. Chen**, H. Lu, W. Deng, J. Xiao, and B. Dai. RDMNet: Reliable Dense-point Matching for Robust and Accurate Point Cloud Registration. *IEEE Trans. on Intelligent Transportation Systems (TITS)*, 2023

[5] J. Ma, **X. Chen**, J. Xu, and G. Xiong. SeqOT: Spatial-Temporal Transformer Networks for Place Recognition Using Sequential LiDAR Data. *IEEE Trans. on Industrial Electronics (TIE)*, 2023

[6] C. Cheng, W. Dai, T. Wu, **X. Chen**, M. Wu, J. Yu, J. Jiang, and H. Lu. Efficient and precise homo-hetero teleoperation based on an optimized upper limb exoskeleton. *IEEE/ASME Trans. on Mechatronics (TMECH)*, 2024

[7] L. Nunes, L. Wiesmann, R. Marcuzzi, **X. Chen**, J. Behley, and C. Stachniss. Temporal Consistent 3D LiDAR Representation Learning for Semantic Perception in Autonomous Driving. In *Proc. of the IEEE/CVF Conf. on Computer Vision and Pattern Recognition (CVPR)*, 2023