

Xieyuanli Chen

RESEARCH ASSISTANT · PHOTOGRAMMETRY & ROBOTICS LAB

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Research Interests

Main Areas: SLAM, Localization, Scene Understanding, Robot Learning

Applications: Autonomous Vehicle; Rescue Robotics

Education

Dr.-Ing. (Ph.D. in Engineering) - *summa cum laude* (with distinction, best possible grade)

University of Bonn, SUPERVISOR: Prof. Dr. Cyrill Stachniss

THESIS: LiDAR-Based Semantic Perception for Autonomous Vehicles

09.2018 - 08.2022

Bonn, Germany

M.S. in Robotics

National University of Defense Technology, SUPERVISOR: Prof. Dr. Hui Zhang

THESIS: Binary Visual Feature-based Monocular SLAM

09.2015 - 12.2017

Hunan, China

B.S. in Electrical Engineering and Automation

Hunan University, SUPERVISOR: Prof. Dr. Jianhao Tan, Prof. Dr. Yaonan Wang

THESIS: Control for a Quadrotor UVA

09.2011 - 07.2015

Hunan, China

Research Experience

ACADEMIC WORKING EXPERIENCE

Associate Editor

IEEE International Conference on Robotics and Automation

09.2022 - Present

Associate Editor

IEEE Robotics and Automation Letters (RA-L)

09.2022 - Present

Research Assistant

Photogrammetry & Robotics Lab, University of Bonn

11.2019 - 08.2022

RESEARCH COMMITTEE MEMBERSHIP

Technical Committee

RoboCup Rescue Robot League

07.2019 - Present

Organizing Committee

Robotics: Science and Systems (RSS) Pioneers 2022

07.2021 - 07.2022

Programme Committee

RoboCup Symposium 2022

04.2022 - 07.2022

Organizing Committee

RoboCup Rescue Robot League

07.2017 - 07.2019

Research Indices

GoogleScholar · h-index: 13 · i10-index: 14 · Number of citations: 751

All indices determined using GoogleScholar with ID DvrngV4AAAAJ

01.10.2022

GitHub · open-source projects: 20 · stars: 3400+ · forks: 700+

01.10.2022

Honors & Awards

RSS Pioneer Robotics: Science and Systems (RSS)	2021
Finalist of Best System Paper Robotics: Science and Systems (RSS)	2020
Best-in-Class Search and Inspect Rescue Robot League (RRL), RoboCup	2022
Best-in-Class Exploration and Mapping Scenario Rescue Robot League (RRL), RoboCup	2022
Best-in-Class Exploration and Mapping Rescue Robot League (RRL), RoboCup	2021
Ph. D. Student Scholarship China Scholarship Council (CSC)	2018
In recognition of Exceptional Performance as Associate Judge Rescue Robot League (RRL), RoboCup	2017
Winner of Rescue Robot Competition IEEE Intl. Sym. on Safety, Security, and Rescue Robotics (SSRR)	2017
Best-in-Class Small Robot Mobility Rescue Robot League (RRL), RoboCup	2016

Teaching Experience

Master Project: Visual LiDAR Odometry Project, MSC	2020
Advanced Techniques in Mobile Sensing and Robotics Course Lecture, MSC	2020
Master Project: Semantic Place Categorization Project, MSC	2019
Sensors and State Estimation Course Lecture, MSC	2019

Student Supervision as Responsible Supervisor

Master Thesis: Deep Learning-based Pole Extractor for Long-term LiDAR Global Localization Student Name: Hao Dong	2022
Intern Project: LiDAR-based Long-term Place Recognition Student Name: Junyi Ma	2022
Intern Project: LiDAR-based Moving Object Segmentation Student Name: Jiadai Sun	2022
Intern Project: Static Map Generation from Point Cloud Data Student Name: Mehul Arora	2021
Intern Project: Pole-based LiDAR Localization Student Name: Hao Dong	2021
Bachelor Thesis: Extracting Color and Semantic Information for LiDAR Point Clouds from Images	2020

Publication List

PEER-REVIEWED JOURNAL ARTICLES

- [1] **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
- [2] **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, 2022
- [3] 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
- [4] B. Mersch, **X. Chen**, I. Vizzo, L. Nunes, J. Behley, and C. Stachniss. Receding Moving Object Segmentation in 3D LiDAR Data Using Sparse 4D Convolutions. *IEEE Robotics and Automation Letters (RA-L)*, 2022
- [5] T. Guadagnino, **X. Chen**, M. Sodano, J. Behley, G. Grisetti, and C. Stachniss. Fast Sparse LiDAR Odometry Using Self-Supervised Feature Selection on Intensity Images. *IEEE Robotics and Automation Letters (RA-L)*, 2022
- [6] S. Li, **X. Chen**, Y. Liu, D. Dai, C. Stachniss, and J. Gall. Multi-scale Interaction for Real-time LiDAR Data Segmentation on an Embedded Platform. *IEEE Robotics and Automation Letters (RA-L)*, 7(2):738–745, 2022
- [7] 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
- [8] Y. Cui, Y. Zhang, **X. Chen**, J. Dong, Q. Wu, and F. Zhu. Bow3d: Bag of words for real-time loop closing in 3d lidar slam. *IEEE Robotics and Automation Letters (RA-L)*, 2022
- [9] N. Zimmerman, T. Guadagnino, **X. Chen**, J. Behley, and C. Stachniss. Long Term Localization using Semantic Cues in Floor Plan Maps. *IEEE Robotics and Automation Letters (RA-L)*, 2022
- [10] L. Nunes, R. Marcuzzi, **X. Chen**, J. Behley, and C. Stachniss. SegContrast: 3D Point Cloud Feature Representation Learning through Self-supervised Segment Discrimination. *IEEE Robotics and Automation Letters (RA-L)*, 7(2):2116–2123, 2022
- [11] H. Dong, **X. Chen**, and C. Stachniss. Online Pole Segmentation on Range Images for Long-term LiDAR Localization in Urban Environments. *Journal on Robotics and Autonomous Systems (RAS)*, 2022
- [12] M. Arora, L. Wiesmann, **X. Chen**, and C. Stachniss. Static Map Generation from 3D LiDAR Point Clouds Exploiting Ground Segmentation. *Journal on Robotics and Autonomous Systems (RAS)*, 2022
- [13] **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
- [14] C. Shi, **X. Chen**, K. Huang, J. Xiao, H. Lu, and C. Stachniss. Keypoint Matching for Point Cloud Registration using Multiplex Dynamic Graph Attention Networks. *IEEE Robotics and Automation Letters (RA-L)*, 6:8221–8228, 2021
- [15] L. Wiesmann, A. Milioto, **X. Chen**, C. Stachniss, and J. Behley. Deep Compression for Dense Point Cloud Maps. *IEEE Robotics and Automation Letters (RA-L)*, 6:2060–2067, 2021

PEER-REVIEWED CONFERENCE PAPERS

- [1] 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
- [2] J. Sun, Y. Dai, X. Zhang, J. Xu, R. Ai, W. Gu, and **X. Chen**. Efficient Spatial-Temporal Information Fusion for LiDAR-Based 3D Moving Object Segmentation. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, 2022
- [3] **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
- [4] I. Vizzo, **X. Chen**, N. Chebrolu, J. Behley, and C. Stachniss. Poisson Surface Reconstruction for LiDAR Odometry and Mapping. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2021
- [5] A. Reinke, **X. Chen**, and C. Stachniss. Simple But Effective Redundant Odometry for Autonomous Vehicles. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2021
- [6] M. Zhou, **X. Chen**, N. Samano, C. Stachniss, and A. Calway. Efficient localisation using images and openstreetmaps. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, 2021

- [7] B. Mersch, **X. Chen**, J. Behley, and C. Stachniss. Self-supervised Point Cloud Prediction Using 3D Spatio-temporal Convolutional Networks. In *Proc. of the Conf. on Robot Learning (CoRL)*, 2021
- [8] H. Dong, **X. Chen**, and C. Stachniss. Online Range Image-based Pole Extractor for Long-term LiDAR Localization in Urban Environments. In *Proc. of the Europ. Conf. on Mobile Robotics (ECMR)*, 2021
- [9] M. Arora, L. Wiesmann, **X. Chen**, and C. Stachniss. Mapping the Static Parts of Dynamic Scenes from 3D LiDAR Point Clouds Exploiting Ground Segmentation. In *Proc. of the Europ. Conf. on Mobile Robotics (ECMR)*, 2021
- [10] **X. Chen**, T. Labe, A. Milioto, T. Rohling, 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
- [11] **X. Chen**, T. Labe, 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
- [12] **X. Chen**, A. Milioto, E. Palazzolo, P. Giguere, 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