

Abhinav Valada

PROFESSOR & DIRECTOR OF ROBOT LEARNING LAB

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Education

Ph.D. in Computer Science (Dr. rer. nat.)

UNIVERSITY OF FREIBURG — **summa cum laude (with highest distinction)**

Thesis: *Discovering and Leveraging Deep Multimodal Structure for Reliable Robot Perception and Localization*

Advisors: Prof. Dr. Wolfram Burgard, Prof. Dr. Dieter Fox

Freiburg, Germany

Aug. 2014 - Feb. 2019

M.S. in Robotics

CARNEGIE MELLON UNIVERSITY

Thesis: *An Autonomous Robot for Manipulation and Mapping of NFT Installations*

Advisors: Prof. Dr. George Kantor and Prof. Dr. Paul Scerri, Carnegie Mellon University, USA

Pittsburgh, USA

Jan. 2012 - Dec. 2013

B.Tech in Electronics and Instrumentation Engineering

VIT UNIVERSITY

Thesis: *Design and Development of a Wireless Sensor Network System for Precision Agriculture*

Advisor: Prof. Dr. George Kantor, Carnegie Mellon University, USA

Vellore, India

Jun. 2006 - Dec. 2010

Academic & Industry Experience

Full Professor (W3), Chair of Autonomous Intelligent Systems

UNIVERSITY OF FREIBURG, DEPARTMENT OF COMPUTER SCIENCE, ROBOT LEARNING LAB

Freiburg, Germany

Aug. 2023 - Present

Assistant Professor (W1) of Robot Learning

UNIVERSITY OF FREIBURG, DEPARTMENT OF COMPUTER SCIENCE, ROBOT LEARNING LAB

Freiburg, Germany

Dec. 2019 - July 2023

Postdoctoral Research Scientist

UNIVERSITY OF FREIBURG, DEPARTMENT OF COMPUTER SCIENCE, AUTONOMOUS INTELLIGENT SYSTEMS LAB

Freiburg, Germany

Mar. 2019 - Nov. 2019

Scientific Research Staff

UNIVERSITY OF FREIBURG, DEPARTMENT OF COMPUTER SCIENCE, AUTONOMOUS INTELLIGENT SYSTEMS LAB

Freiburg, Germany

Aug. 2014 - Feb. 2019

Co-founder & Director of Operations

PLATYPUS LLC

Pittsburgh, USA

Aug. 2012 - Aug. 2015

Systems Engineer

NATIONAL ROBOTICS ENGINEERING CENTER

Pittsburgh, USA

Jul. 2013 - Jul. 2014

Systems/Software Engineer

CARNEGIE MELLON UNIVERSITY, THE ROBOTICS INSTITUTE, FIELD ROBOTICS CENTER

Pittsburgh, USA

Nov. 2011 - Jun. 2013

Research Scholar

CARNEGIE MELLON UNIVERSITY, THE ROBOTICS INSTITUTE, FIELD ROBOTICS CENTER

Pittsburgh, USA

Jan. 2010 - Oct. 2011

Research Assistant

VIT UNIVERSITY

Vellore, India

Aug. 2008 - Dec. 2009

Research Associate

INDIAN INSTITUTE OF TECHNOLOGY MADRAS

Chennai, India

May. 2009 - Jul. 2009

Research Intern

ABB ROBOTICS

Bangalore, India

Apr. 2008 - Jun. 2008

Honors & Awards

Honors

IROS Toshio Fukuda Young Professional Award for contributions to the advancement of robot learning

2024

IEEE Early Career Award in Robotics and Automation for contributions that have had a major impact in robotics

2023

Emmy Noether AI Fellow of the DFG - German Research Foundation

2021

Scholar of the European Laboratory for Learning and Intelligent Systems (ELLIS) Society

2020

Awards

Best Paper Award on Cognitive Robotics at IROS	2024
Best Student Paper Award Finalist at IROS	2024
Outstanding Workshop Presentation Award at IROS Workshop on Long-Term Perception for Autonomy	2024
Third place at the Future Prize (Zukunftspreis)	2024
Best Paper Award Honorable Mention IEEE Robotics and Automation Letters	2023
Best Paper Award at IROS 2022 Workshop on Mobile Manipulation and Embodied Intelligence	2022
NVIDIA Research Award for socially compliant autonomous robot navigation	2022
AutoSens Most Novel Research Award for amodal panoptic segmentation	2022
Second Place in the CVPR Embodied AI SoundSpaces Challenge	2022
Winner of the NeurIPS AI Driving Olympics - Panoptic Tacking Challenge	2021
Winner of the CVPR Embodied AI SoundSpaces Challenge	2021
AutoSens Silver 2020 Vision Award for inspiring progress throughout the vehicle perception ecosystem	2020
Finalist for Young Engineer of the Year Award at AutoSens for demonstrating great achievement & leadership in ADAS	2020
Winner of the ECCV Robust Vision Challenge - Panoptic Segmentation	2020
Finalist for Georges Giralt PhD Award for the Best Robotics PhD Thesis in Europe	2020
Doctoral Consortium Award at The International Symposium on Robotics Research (ISRR)	2017
Chancellor's Scholarship at VIT University	2009

Funded Research Projects

Collaborative Research Centre 1597 Small Data - Essentials For Few-Shot Learning

Principal Investigator, funded by GERMAN RESEARCH FOUNDATION (DFG)

2023-2027

AI-based System Architectures for Automated Driving

Coordinator, funded by ROBERT BOSCH GMBH, LIGHTHOUSE COLLABORATION

2023-2026

Zuse School ELIZA

Principal Investigator, funded by FEDERAL MINISTRY OF EDUCATION AND RESEARCH (BMBF)

2022-2027

Autonomous Robust Outdoor Robots

Principal Investigator, funded by BADEN-WÜRTTEMBERG FOUNDATION

2023-2025

Robot Learning for Long-Horizon Mobile Manipulation

Principal Investigator, funded by TOYOTA MOTOR EUROPE

2023-2025

Learning BEV Maps for Automated Driving

Principal Investigator, funded by QUALCOMM TECHNOLOGIES, INC.

2022-2025

Learning Multisensory Integration for Neural Circuits Modeling

Principal Investigator, funded by CLUSTER OF EXCELLENCE BRAINLINKS-BRAINTOOLS

2022-2023

Efficient Learning for Transferable Robot Autonomy in Human-Centered Env.

Principal Investigator, funded by GERMAN RESEARCH FOUNDATION (DFG), EMMY NOETHER AI PROGRAM

2022-2027

Responsible and Scalable Learning for Robots Assisting Humans

Principal Investigator, funded by CARL ZEISS FOUNDATION

2022-2028

Intelligent Scene Understanding of Operating Room Video Streams

Principal Investigator, funded by STRYKER CORPORATION

2021-2025

Embodied Cognitive Robotics

Principal Investigator, funded by EVA MAYR-STIHL FOUNDATION

2020-2022

Brain Controlled Service Robots

Principal Investigator, funded by CLUSTER OF EXCELLENCE BRAINLINKS-BRAINTOOLS

2020-2023

From Learning to Relearning Algorithmic Fairness in Socially-Aware Robot Navigation

Principal Investigator, funded by CLUSTER OF EXCELLENCE BRAINLINKS-BRAINTOOLS

2020-2022

Intel. System for Autonomous Monitoring of Production Plants in Industry 4.0

Principal Investigator, funded by FEDERAL MINISTRY OF EDUCATION AND RESEARCH (BMBF)

2020-2022

Sensor Systems for Localization of Trapped Victims in Collapsed Infrastructure

Principal Investigator, funded by FEDERAL MINISTRY OF EDUCATION AND RESEARCH (BMBF)

2020-2022

Open Deep Learning Toolkit for Robotics

Principal Investigator, funded by EUROPEAN COMMISSION H2020

2020-2023

Robust Localization Using Deep Landmark Features

Co-Principal Investigator, funded by SAMSUNG GRO

2017-2018

Invited Talks

Plenary and Keynote Talks

IEEE IROS Workshop on Embodied Navigation to Movable Objects - Keynote Talk, Abu Dhabi, AE	Oct. 2024
IEEE ITSC Workshop on Vision and Language Oriented Representation - Keynote Talk, Edmonton, CA	Sep. 2024
11th International Conference on Signal Processing and Integrated Networks - Keynote Talk, New Delhi, IN	Mar. 2024
14th International Conference on Cloud Computing, Data Science & Engineering - Keynote Talk, New Delhi, IN	Jan. 2024
Bosch Distinguished Lecture on Machine Learning and Artificial Intelligence - Keynote Talk, Renningen, DE	Aug. 2023
Edinburgh Center for Robotics and the Alan Turing Institute Symposium - Keynote Talk, Edinburgh, UK	Jun. 2023
IEEE IV Workshop on Bridging the Gap between Map-based and Map-less Driving - Keynote Talk, Anchorage, US	Jun. 2023
IEEE IV Workshop on Data Driven Intelligent Vehicle Applications - Keynote Talk, Anchorage, US	Jun. 2023
Robotics & AI Research Conference - Keynote Talk, Rome, IT	Mar. 2023
13th International Conference on Cloud Computing, Data Science & Engineering - Keynote Talk, New Delhi, IN	Jan. 2023
ECCV Workshop on Map-Based Localization for Autonomous Driving - Keynote Talk, Tel Aviv, IL	Oct. 2022
International Symposium on Robotics Research (ISRR) - Distinguished Speaker, Geneva, CH	Sep. 2022
IEEE Intelligent Vehicles Symposium Workshop on Beyond Supervised Learning - Keynote Talk, Aachen, DE	Jun. 2022
Robotics and Computer Science World Forum (RoboComp 2021) - Keynote Talk, Amsterdam, NL	Oct. 2021
3rd International Workshop on Data Driven Intelligent Vehicle Applications - Keynote Talk, Nagoya, JP	Jul. 2021
IEEE International Conference on Unmanned Systems (ICUS 2020) - Plenary Talk, Harbin, CN	Nov. 2020
AutoSens Conference - Keynote Talk, Brussels, BE	Jul. 2020

Other Invited Talks

IEEE IROS Workshop on Interaction-aware Autonomous Systems - Abu Dhabi, AE	Oct. 2024
Toyota TRACE Workshop Leuven, BE	Sep. 2024
Freiburg.ai Freiburg, DE	Aug. 2024
Halmstad University Halmstad, SE	Jun. 2024
Zebra Technologies AiLN Seminar London, UK	Feb. 2024
KION Group Research Series Online	Feb. 2024
Freiburg Robotics and Biology Conference Freiburg, DE	Nov. 2023
Freiburg-Oxford Workshop on Internal World Models in Animals, Humans, and AI Freiburg, DE	Nov. 2023
Summer School on Deep Learning for Autonomous Systems and Smart Cities , Aarhus, DK	May 2023
KTH Royal Institute of Technology , Stockholm, SE	Nov. 2022
TU Delft , Delft, NL	Nov. 2022
Workshop on Embedded Optimization and Learning for Robotics and Mechatronics , Freiburg, DE	Oct. 2022
Summer School on Continuous Engineering and Deep Learning for Trustworthy Autonomous Sys. , Thessaloniki, GR	Oct. 2022
Australian Centre for Field Robotics , Sydney, AU	Jun. 2022
TU Nuremberg , Nuremberg, DE	Jun. 2022
University of Bonn , Bonn, DE	May. 2022
Sapienza University of Rome , Rome, IT	Apr. 2022
Qualcomm Technologies , Online	Mar. 2022
TU Graz , Graz, AT	Jan. 2022
ICAR Workshop on Design, Learning, and Control for Safe Human-Robot Collaboration Ljubljana, SL	Dec. 2021
Universidad De Las Américas Puebla , Puebla, MX	Dec. 2021
Bosch Corporate Research , Renningen, DE	Nov. 2021
IROS Workshop on Open Deep Learning Toolkit for Robotics Prague, CZ	Sep. 2021
Karlsruhe Institute of Technology , Karlsruhe, DE	Jun. 2022
Robert Bosch , Heilbronn, DE	Mar. 2021
Toyota Research Institute , Los Altos, US	Jul. 2020
Wayve , London, UK	Jul. 2020
Freiburg Center for Data Analysis and Modeling, University of Freiburg , Freiburg, DE	May 2020
Sapienza University of Rome , Rome, IT	Mar. 2020

Robert Bosch Center for Data Science and Artificial Intelligence , Chennai, IN	Sep. 2018
Indo-German Workshop on Sensor Systems for Localization in Collapsed Infrastructure , New Delhi, IN	Sep. 2018
Field Robotics Center Seminar, Carnegie Mellon University , Pittsburgh, US	Jul. 2018
NVIDIA GPU Technology Conference Europe , Amsterdam, NL	Sep. 2016
IEEE IROS Workshop on State Estimation and Terrain Perception , Daejeon, KR	Oct. 2016
Field Robotics Center Seminar, Carnegie Mellon University , Pittsburgh, US	Jun. 2016
Field Robotics Center Seminar, Carnegie Mellon University , Pittsburgh, US	Dec. 2013
International Conference of Agricultural Engineering , Valencia, ES	Jul. 2012
VIT Alumni Lecture , Vellore, IN	Jun. 2012
The Indian Institute of Technology Madras , Chennai, IN	Jun. 2012
Field Robotics Center Seminar, Carnegie Mellon University , Pittsburgh, US	Sep. 2010
IEEE Resonance, VIT University , Vellore, IN	Jul. 2008

Teaching Experience

Advanced Deep Learning - University of Freiburg, MSc, lecture	2024-Present
Artificial Intelligence - University of Freiburg, MSc, lecture	2024-Present
Machine Learning - University of Freiburg, MSc, lecture	2023-Present
Introduction to Mobile Robotics - University of Freiburg, MSc, lecture	2022-Present
Foundations of Deep Learning - University of Freiburg, MSc, lecture	2019-Present
Deep Learning Laboratory - University of Freiburg, MSc, laboratory	2018-Present
FreiCAR: Practical Autonomous Driving - University of Freiburg, MSc, laboratory	2020-Present
Learning from Limited Supervision - University of Freiburg, MSc, seminar	2022-Present
Robot Learning - University of Freiburg, MSc, seminar	2021-Present
Deep Learning for Autonomous Systems - University of Freiburg, MSc, seminar	2020
Self-Supervised Learning - University of Freiburg, MSc, seminar	2020
Deep Learning for Autonomous Driving - University of Freiburg, MSc, laboratory	2018
Robot Navigation - University of Freiburg, MSc, seminar	2015-2017
Robot Perception - University of Freiburg, MSc, seminar	2015

Advising and Mentoring

PhD Supervision (24 PhD Students)

Imen Mahdi	PhD	11/2024-Present
Jiarong Wei	PhD	06/2024-Present
Liudi Yang	PhD	05/2024-Present
Mohamed Abdelsamad	PhD	02/2024-Present
Markus Käppeler	PhD	01/2024-Present
Sajad Marvi	PhD	10/2023-Present
Iana Zhura	PhD	08/2023-Present
Nicholas Autio Mitchell	PhD	07/2023-Present
Maximilian Luz	PhD	07/2023-Present
Sharang Kaul	PhD	02/2023-Present
Jan Ole von Hartz	PhD	12/2022-Present
Julia Hindel	PhD	09/2022-Present
Nick Heppert	PhD	09/2022-Present
José Arce y de la Borbolla	PhD	07/2022-Present
Kürsat Petek	PhD (Co-advised)	06/2022-Present
Martin Büchner	PhD	10/2021-Present
Adrian Röfer	PhD	06/2021-Present
Niclas Vödisch	PhD (Co-advised)	05/2021-Present
Rohit Mohan	PhD	05/2021-Present
Christopher Lang	PhD	11/2020-Present
Eugenio Chisari	PhD	09/2020-Present
Nikhil Gosala	PhD	07/2020-Present
Daniel Honerkamp	PhD	05/2020-Present

PostDoc Supervision (6 PostDoctoral Researchers)

Simon Bultmann	PostDoc	10/2024-Present
Lukas Luft	PostDoc	08/2023-Present
Daniel Büscher	PostDoc	08/2023-Present
Daniele Cattaneo	PostDoc	01/2020-Present
Paulo Drews-Jr	PostDoc (Capes-Humboldt Fellowship)	08/2021-Present
Tim Welschehold	PostDoc	03/2020-Present

Master Theses (32 Master Students)

Sven Pfitzer	Master Thesis	2024
Amrutha Venkatesan	Master Thesis	2024
Aron Distelzweig	Master Thesis	2024
Simon Andreas Dorer	Master Thesis	2024
Ahmet Selim Canakci	Master Thesis	2024
Jonas Schramm	Master Thesis	2023
Sassan Mokhtar	Master Thesis	2023
Kiran Kumaraswamy	Master Thesis	2023
Elias Greve	Master Thesis	2023
Akshay Mirylkar	Master Thesis	2023
Abdallah Ayad	Master Thesis	2023
Nayana Koneru	Master Thesis	2023
Amith Boggram	Master Thesis	2023
Abhijeet Nayak	Master Thesis	2023
Markus Käppeler	Master Thesis	2023
Asmaa Khalid	Master Thesis	2023
Monish Reddy Nallapareddy	Master Thesis	2023
Kiran Kumaraswamy	Master Thesis	2023
Fabian Schmalstieg	Master Thesis	2023
Venkat Subramanyam	Master Thesis	2023
Jan Ole von Hartz	Master Thesis	2022
Francesco Peracchia	Master Thesis	2022
Lorenzo Mur Labadia	Master Thesis	2022
Suresh Guttikonda	Master Thesis	2022
José Arce y de la Borbolla	Master Thesis	2022
Jing Lu	Master Thesis	2022
Abdelrahman Younes	Master Thesis	2021
Sai Sourabh Tiruvaipati	Master Thesis	2021
Rohit Mohan	Master Thesis	2021
Borna Bešić	Master Thesis	2021
Manav Madan	Master Thesis	2019
Eduardo Alvarado	Master Thesis	2019
Johan Vertens	Master Thesis	2016

Visitors

Prof. Giovanni Beltrame	Visiting Professor	2024
Niyati Rawal	PhD Exchange Student	2024
Bhavesh Garg	Internship	2024
Mohammad Mohammadi	PhD Exchange Student	2024
Jiaye Yang	MSc Exchange Student	2023
Alvari Seppänen	PhD Exchange Student	2023
Harsh Mahesheka	DAAD-WISE Internship	2023
Abhinav Gupta	Internship	2022
Jasmeet Kaur	Internship	2021

Matteo Vaghi	Internship	2020
Jay Patravali	Internship	2017
Mayank Mittal	DAAD-WISE Internship	2017
Rohit Suri	DAAD-WISE Internship	2017
Himanshu Maurya	DAAD-WISE Internship	2018
Ankit Dhall	DAAD-WISE Internship	2016

Academic Activities

Editorial Services

General Chair , German Conference on Pattern Recognition (GCPR)		2024
Chair , IEEE Robotics and Automation Society (RAS) Technical Committee on Robot Learning		2021-Present
Senior Editor , IEEE Robotics and Automation Letters (RA-L)		2024-Present
Area Chair , Conference on Robot Learning (CoRL)		2020-Present
Guest Editor , IEEE Transactions on Robotics (T-RO)		2024
Guest Editor , Sensors Journal, Special Issue on Sensing and Semantic Perception in Autonomous Driving		2021
Associate Editor , International Journal of Robotics Research (IJRR)		2023-Present
Associate Editor , IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)		2020-Present
Associate Editor , IEEE International Conference on Robotics and Automation (ICRA)		2020-Present
Associate Editor , International Symposium on Robotics Research (ISRR)		2022-Present
Associate Editor , IEEE International Conference on Advanced Robotics (ICAR)		2021
Associate Editor , IEEE Robotics and Automation Letters (RA-L)		2019-2023
Senior Program Committee Member , International Joint Conference on Artificial Intelligence (IJCAI)		2021-Present
Program Committee Member , AAAI Conference on Artificial Intelligence, Student Abstract and Poster Program		2020-2023
Program Committee Member , Conference on Robot Learning (CoRL)		2019-2020
Program Committee Member , Robotics: Science and Systems (RSS)		2020-2021
Program Committee Member , 24th European Conference on Artificial Intelligence (ECAI)		2020
General Co-chair , RSS Pioneers, Robotics: Science and Systems Conference (RSS)		2019

Workshop & Tutorial Organization

Label Efficient Learning Paradigms for Autonomy at Scale , IEEE/RSJ Int. Conference on Intelligent Robots and Systems		2024
Interaction-Aware Autonomous Systems , IEEE/RSJ Int. Conference on Intelligent Robots and Systems (IROS)		2024
RoboNerF: Neural Fields in Robotics , IEEE International Conference on Robotics and Automation (ICRA)		2024
Mobile Manipulation and Embodied Intelligence , IEEE International Conference on Robotics and Automation (ICRA)		2024
3D-Deep Learning for Automated Driving , IEEE Intelligent Vehicles Symposium (IV)		2020, 21, 22, 23
Open and Trustworthy Deep Learning for Robotics , IEEE/RSJ Int. Conference on Intelligent Robots and Systems (IROS)		2022
Perception and Navigation for Autonomous Robotics in Unstructured and Dynamic Environments , IEEE/RSJ IROS		2022
AI Driving Olympics , Conference on Neural Information Processing Systems (NeurIPS)		2021
Scene Understanding for Unstructured Environments , DAGM German Conference on Pattern Recognition (GCPR)		2021
Self-Supervised Robot Learning , Robotics: Science and Systems Conference (RSS)		2020

Reviewing

Project Proposals

European Commission, German Research Foundation (DFG), Swiss National Science Foundation (SNSF), German Academic Exchange Service (DAAD)

Journals

International Journal of Robotics Research (IJRR), International Journal of Computer Vision (IJCV), IEEE Transactions on Robotics (T-RO), IEEE Transactions on Neural Networks and Learning Systems (TNNLS), Robotics and Autonomous Systems (RAS), IEEE Robotics and Automation Letters (RA-L), IEEE Robotics & Automation Magazine, Journal of Field Robotics (JFR), International Journal of Pattern Recognition and Artificial Intelligence (IJPRAI), IEEE Transactions on Industrial Electronics (T-IE), IEEE Transactions on Multimedia (T-MM), Sensors

Conferences

Conference on Robot Learning (CoRL), IEEE Conference on Computer Vision and Pattern Recognition (CVPR), IEEE International Conference on Computer Vision (ICCV), Robotics: Science and Systems (RSS), IEEE International Conference on Robotics and Automation (ICRA), IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), International Conference on Field and Service Robotics (FSR), International Symposium on Robotics Research (ISRR), European Conference on Mobile Robotics (ECMR), International Conference on Advanced Robotics (ICAR), German Conference on Pattern Recognition (GCPR), International Conference on Intelligent Robotics and Applications (ICIRA)

External Ph.D. Committee Memberships

Technical University Eindhoven , Netherlands	2024
Halmstad University , Sweden	2024
Technical University of Munich , Germany	2023, 2024
The University of Sydney , Australia	2023
German Research Centre for Artificial Intelligence , Germany	2023
TU Delft , Netherlands	2022
University of Bonn , Germany	2021, 2024

Other Activities

IEEE Autonomous Agent Alignment Working Group (VT/AVSC/AAA-WG) , Founding Member	since 2024
ELIZA , Scholarships & PhD Admissions Committee Member	since 2023
ELLIS Unit Freiburg , Founding Faculty	since 2020
BrainLinks-BrainTools Center , Member and Principal Investigator	since 2019

University Departmental Services

- **Admissions Committee Member**, MSc. Computer Science Program, University of Freiburg
- **Organizing Committee Member**, Robotics: Science and Systems (RSS) 2019
- **Organizing Committee Member**, International Conference on Sensors and Related Networks 2007
- **Public Spaces Committee Member**, Field Robotics Center, Carnegie Mellon University

Consultancy Activities

Advisory Board Member , EU Horizon Europe EVENTS project	2023-Present
Industry Advisory Activities , NDA	since 2022

Software & Datasets

My group strives to make research code and datasets available as open source whenever possible.

Code: <https://github.com/robot-learning-freiburg>

Datasets: <https://rl.uni-freiburg.de/datasets-code>

Publications

Manuscripts Under Review

- **Zero-Cost Whole-Body Teleoperation for Mobile Manipulation**
Daniel Honerkamp, Harsh Mahesheka, Jan Ole Hartz, Tim Welschehold, Abhinav Valada
arXiv preprint arXiv:2409.15095(), 2024
- **Panoptic-Depth Forecasting**
Juana Valeria Hurtado, Riya Mohan, Abhinav Valada
arXiv preprint arXiv:2409.12008(), 2024
- **Motion Forecasting via Model-Based Risk Minimization**
Aron Distelzweig, Eitan Kosman, Andreas Look, Faris Janjoš, Denesh K. Manivannan, Abhinav Valada
arXiv preprint arXiv:2409.10585(), 2024
- **Visual-Inertial SLAM for Agricultural Robotics: Benchmarking the Benefits and Computational Costs of Loop Closing**
Fabian Schmidt, Constantin Blessing, Markus Enzweiler, Abhinav Valada
arXiv preprint arXiv:2408.01716(), 2024
- **Taxonomy-Aware Continual Semantic Segmentation in Hyperbolic Spaces for Open-World Perception**
Julia Hindel, Daniele Cattaneo, Abhinav Valada
arXiv preprint arXiv:2407.18145(), 2024
- **A Good Foundation is Worth Many Labels: Label-Efficient Panoptic Segmentation**
Niclas Vödich, Kürsat Petek, Markus Käppeler, Abhinav Valada, Wolfram Burgard
arXiv preprint arXiv:2405.19035(), 2024
- **PseudoTouch: Efficiently Imaging the Surface Feel of Objects for Robotic Manipulation**
Adrian Röfer, Nick Heppert, Abdallah Ayman, Eugenio Chisari, Abhinav Valada

- **CMRNext: Camera to LiDAR Matching in the Wild for Localization and Extrinsic Calibration**
Daniele Cattaneo, Abhinav Valada
arXiv preprint arXiv:2402.00129(), 2024

Peer-Reviewed Journal and Conference Articles

- **Learning Robotic Manipulation Policies from Point Clouds with Conditional Flow Matching**
Eugenio Chisari, Nick Heppert, Max Argus, Tim Welschehold, Thomas Brox, Abhinav Valada
Conference on Robot Learning (CoRL)(), 2024
- **Progressive Multi-Modal Fusion for Robust 3D Object Detection**
Rohit Mohan, Daniele Cattaneo, Florian Drews, Abhinav Valada
Conference on Robot Learning (CoRL)(), 2024
- **Perception Matters: Enhancing Embodied AI with Uncertainty-Aware Semantic Segmentation**
Sai Prasanna, Daniel Honerkamp, Kshitij Sirohi, Tim Welschehold, Wolfram Burgard, Abhinav Valada
Proceedings of the International Symposium on Robotics Research (ISRR)(), 2024
- **The Art of Imitation: Learning Long-Horizon Manipulation Tasks from Few Demonstrations**
Jan Hartz, Tim Welschehold, Abhinav Valada, Joschka Boedecker
IEEE Robotics and Automation Letters (RA-L)(), 2024
- **Automatic Target-Less Camera-LiDAR Calibration from Motion and Deep Point Correspondences**
Kürsat Petek, Niclas Vödisch, Johannes Meyer, Daniele Cattaneo, Abhinav Valada, Wolfram Burgard
IEEE Robotics and Automation Letters (RA-L)(), 2024
- **Recent Trends in Insect and Robot Navigation through the Lens of Reinforcement Learning**
Stephan Lochner, Daniel Honerkamp, Abhinav Valada, Andrew D. Straw
Frontiers in Computational Neuroscience, 18() 2024
- **AmodalSynthDrive: A Synthetic Amodal Perception Dataset for Autonomous Driving**
Ahmed Rida Sekkat, Rohit Mohan, Oliver Sawade, Elmar Matthes, Abhinav Valada
IEEE Robotics and Automation Letters (RA-L)(), 2024
- **Language-Grounded Dynamic Scene Graphs for Interactive Object Search with Mobile Manipulation**
Daniel Honerkamp, Martin Büchner, Fabien Despinoy, Tim Welschehold, Abhinav Valada
IEEE Robotics and Automation Letters (RA-L)(), 2024
- **Bayesian Optimization for Sample-Efficient Policy Improvement in Robotic Manipulation**
Adrian Röfer, Iman Nematollahi, Tim Welschehold, Wolfram Burgard, Abhinav Valada
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2024
- **DITTO: Demonstration Imitation by Trajectory Transformation**
Nick Heppert, Max Argus, Tim Welschehold, Thomas Brox, Abhinav Valada
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2024
- **BEVCar: Camera-Radar Fusion for BEV Map and Object Segmentation**
Jonas Schramm, Niclas Vödisch, Kürsat Petek, Ravi B Kiran, Senthil Yogamani, Wolfram Burgard, Abhinav Valada
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2024
- **A Point-Based Approach to Efficient LiDAR Multi-Task Perception**
Lang Christopher, Alexander Braun, Lars Schillingmann, Abhinav Valada
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2024
- **LetsMap: Unsupervised Representation Learning for Semantic BEV Mapping**
Nikhil Gosala, Kürsat Petek, B Ravi Kiran, Senthil Yogamani, Paulo L. J. Drews-Jr, Wolfram Burgard, Abhinav Valada
European Conference on Computer Vision (ECCV)(), 2024
- **Syn-Mediverse: A Multimodal Synthetic Dataset for Intelligent Scene Understanding of Healthcare Facilities**
Rohit Mohan, José Arce, Sassan Mokhtar, Daniele Cattaneo, Abhinav Valada
IEEE Robotics and Automation Letters (RA-L), 9(8), PP. 7094–7101, 2024
- **Fairness and Bias in Robot Learning**
Laura Londono, Juana Valeria Hurtado, Nora Hertz, Phillip Kellmeyer, Silja Voenekey, Abhinav Valada
Proceedings of the IEEE, 112(4), PP. 305–330, 2024
- **Internal world models in humans, animals, and AI**
Ilka Diester, Marlene Bartos, Joschka Bödecker, Adam Kortylewski, Christian Leibold, Johannes Letzkus, Mathew M. Nour, Monika Schönauer, Andrew Straw, Abhinav Valada, Andreas Vlachos, Thomas Brox
Neuron, 112(14), PP. 2265–2268, 2024
- **Hierarchical Open-Vocabulary 3D Scene Graphs for Language-Grounded Robot Navigation**
Abdelrhman Werby, Chenguang Huang, Martin Büchner, Abhinav Valada, Wolfram Burgard

- **CenterGrasp: Object-Aware Implicit Representation Learning for Simultaneous Shape Reconstruction and 6-DoF Grasp Estimation**
Eugenio Chisari, Nick Heppert, Tim Welschehold, Wolfram Burgard, Abhinav Valada
IEEE Robotics and Automation Letters (RA-L), 9(6), PP. 5094–5101, 2023
- **Evaluation of a Smart Mobile Robotic System for Industrial Plant Inspection and Supervision**
Georg K.J. Fischer, Max Bergau, D. Adriana Gómez-Rosal, Andreas Wachaja, Johannes Gräter, Matthias Odenweller, Uwe Piechottka, Fabian Hoeflinger, Nikhil Gosala, Niklas Wetzel, Daniel Büscher, Abhinav Valada, Wolfram Burgard
IEEE Sensors Journal(), 2024
- **Panoptic Out-of-Distribution Segmentation**
Rohit Mohan, Kiran Kumaraswamy, Juana Valeria Hurtado, Kürsat Petek, Abhinav Valada
IEEE Robotics and Automation Letters (RA-L), 9(5), PP. 4075–4082, 2024
- **Amodal Optical Flow**
Maximilian Luz, Rohit Mohan, Ahmed Rida Sekkat, Oliver Sawade, Elmar Matthes, Thomas Brox, Abhinav Valada
IEEE International Conference on Robotics and Automation (ICRA), 2024
- **Compositional Servoing by Recombining Demonstrations**
Max Argus, Abhijeet Nayak, Martin Büchner, Silvio Galesso, Abhinav Valada, Thomas Brox
IEEE International Conference on Robotics and Automation (ICRA), 2024
- **Online Estimation of Articulated Objects with Factor Graphs using Vision and Proprioceptive Sensing**
Russell Buchanan, Adrian Röfer, João Moura, Abhinav Valada, Sethu Vijayakumar
IEEE International Conference on Robotics and Automation (ICRA), 2024
- **Few-Shot Panoptic Segmentation With Foundation Models**
Markus Käppeler, Kürsat Petek, Niclas Vödisch, Wolfram Burgard, Abhinav Valada
IEEE International Conference on Robotics and Automation (ICRA), 2024
- **RaLF: Flow-based Global and Metric Radar Localization in LiDAR Maps**
Abhijeet Nayak, Daniele Cattaneo, Abhinav Valada
IEEE International Conference on Robotics and Automation (ICRA), 2024
- **Collaborative Dynamic 3D Scene Graphs for Automated Driving**
Elias Greve, Martin Büchner, Niclas Vödisch, Wolfram Burgard, Abhinav Valada
IEEE International Conference on Robotics and Automation (ICRA), 2024
- **Self-Supervised Representation Learning from Temporal Ordering of Automated Driving Sequences**
Christopher Lang, Alexander Braun, Lars Schillingmann, Karsten Haug, Abhinav Valada
IEEE Robotics and Automation Letters (RA-L), 9(3), PP. 2582–2589, 2023
- **Self-Supervised Multi-Object Tracking From Consistency Across Timescales**
Christopher Lang, Alexander Braun, Lars Schillingmann, Abhinav Valada
IEEE Robotics and Automation Letters (RA-L), 8(11), PP. 7711–7718, 2023
- **Multi-camera Bird’s Eye View Perception for Autonomous Driving**
David Unger, Nikhil Gosala, Varun Ravi Kumar, Shubhankar Borse, Abhinav Valada, Senthil Yogamani
Computer Vision: Challenges, Trends, and Opportunities(), CRC PRESS, 2023
- **A Smart Robotic System for Industrial Plant Supervision**
D. Adriana Gómez-Rosal, Max Bergau, Georg K.J. Fischer, Andreas Wachaja, Johannes Gräter, Uwe Piechottka, Fabian Hoeflinger, Nikhil Gosala, Niklas Wetzel, Daniel Büscher, Abhinav Valada, Wolfram Burgard
IEEE SENSORS() , 2023
- **Learning Hierarchical Interactive Multi-Object Search for Mobile Manipulation**
Fabian Schmalstieg, Daniel Honerkamp, Tim Welschehold, Abhinav Valada
IEEE Robotics and Automation Letters (RA-L), 8(12), PP. 8549–8556, 2023
- **The Treachery of Images: Bayesian Scene Keypoints for Deep Policy Learning in Robotic Manipulation**
Jan Ole Hartz, Eugenio Chisari, Tim Welschehold, Wolfram Burgard, Joschka Boedecker, Abhinav Valada
IEEE Robotics and Automation Letters (RA-L), 8(11), PP. 6931–6938, 2023
- **INoD: Injected Noise Discriminator for Self-Supervised Representation Learning in Agricultural Fields**
Julia Hindel, Nikhil Gosala, Kevin Bregler, Abhinav Valada
IEEE Robotics and Automation Letters (RA-L), 8(9), PP. 6013–6020, 2023
- **Efficient Learning of Urban Driving Policies Using Bird’s-Eye-View State Representations**
Raphael Trumpp, Martin Büchner, Abhinav Valada, Marco Caccamo
IEEE International Conference on Intelligent Transportation Systems (ITSC), 2023
- **EvCenterNet: Uncertainty Estimation for Object Detection using Evidential Learning**
Monish R. Nallapareddy, Kshitij Sirohi, Paulo L. J. Drews-Jr, Wolfram Burgard, Chih-Hong Cheng, Abhinav Valada
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2023
- **N2M2: Learning Navigation for Arbitrary Mobile Manipulation Motions in Unseen and Dynamic Environments**
Daniel Honerkamp, Tim Welschehold, Abhinav Valada

- **CoDEPS: Online Continual Learning for Depth Estimation and Panoptic Segmentation**
Niclas Vödisch, Kürsat Petek, Wolfram Burgard, Abhinav Valada
Robotics: Science and Systems (RSS), 2023
- **SkyEye: Self-Supervised Bird’s-Eye-View Semantic Mapping Using Monocular Frontal View Images**
Nikhil Gosala, Kürsat Petek, Paulo LJ Drews-Jr, Wolfram Burgard, Abhinav Valada
IEEE/ CVF International Conference on Computer Vision and Pattern Recognition (CVPR), 2023
- **CARTO: Category and Joint Agnostic Reconstruction of ARTiculated Objects**
Nick Heppert, Muhammad Zubair Irshad, Sergey Zakharov, Katherine Liu, Rares Andrei Ambrus, Jeannette Bohg, Abhinav Valada, T Kollar
IEEE/ CVF International Conference on Computer Vision and Pattern Recognition (CVPR), 2023
- **Learning and Aggregating Lane Graphs for Urban Automated Driving**
Martin Büchner, Jannik Zürn, Ion-George Todoran, Abhinav Valada, Wolfram Burgard
IEEE/ CVF International Conference on Computer Vision and Pattern Recognition (CVPR), 2023
- **Neural Architecture Search for Dense Prediction Tasks in Computer Vision**
Thomas Elsken, Arber Zela, Jan Hendrik Metzen, Benedikt Staffler, Thomas Brox, Abhinav Valada, Frank Hutter
International Journal of Computer Vision (IJCV), 131(7), PP. 1784–1807, 2022
- **PADLoC: LiDAR-Based Deep Loop Closure Detection and Registration using Panoptic Attention**
José Arce, Niclas Vödisch, Daniele Cattaneo, Wolfram Burgard, Abhinav Valada
IEEE Robotics and Automation Letters (RA-L), 8(3), PP. 1319–1326, 2023
- **Catch Me If You Hear Me: Audio-Visual Navigation in Complex Unmapped Environments with Moving Sounds**
Abdelrahman Younes, Daniel Honerkamp, Tim Welschehold, Abhinav Valada
IEEE Robotics and Automation Letters (RA-L), 8(2), PP. 928–935, 2023
- **Interactive Imitation Learning in Robotics: A Survey**
Carlos Celemin, Rodrigo Pérez-Dattari, Eugenio Chisari, Giovanni Franzese, Leandro Souza Rosa, Ravi Prakash, Zlatan Ajanović, Marta Ferraz, Abhinav Valada, Jens Kober
Foundations and Trends in Robotics, 10(1-2), PP. 1–197, 2022
- **Learning Long-Horizon Robot Exploration Strategies for Multi-Object Search in Continuous Action Spaces**
Fabian Schmalstieg, Daniel Honerkamp, Tim Welschehold, Abhinav Valada
International Symposium on Robotics Research (ISRR), 2022
- **Continual SLAM: Beyond Lifelong Simultaneous Localization and Mapping through Continual Learning**
Niclas Vödisch, Daniele Cattaneo, Wolfram Burgard, Abhinav Valada
International Symposium on Robotics Research (ISRR), 2022
- **On Hyperbolic Embeddings in 2D Object Detection**
Christopher Lang, Alexander Braun, Abhinav Valada
German Conference on Pattern Recognition (GCPR), 2022
- **Contrastive Object Detection Using Knowledge Graph Embeddings**
Christopher Lang, Alexander Braun, Abhinav Valada
German Conference on Pattern Recognition (GCPR), 2021
- **Perceiving the Invisible: Proposal-Free Amodal Panoptic Segmentation**
Rohit Mohan, Abhinav Valada
IEEE Robotics and Automation Letters (RA-L), 7(4), PP. 9302–9309, 2022
- **3D Multi-Object Tracking Using Graph Neural Networks with Cross-Edge Modality Attention**
Martin Büchner, Abhinav Valada
IEEE Robotics and Automation Letters (RA-L), 7(4), PP. 9707–9714, 2022
- **OpenDR: An Open Toolkit for Enabling High Performance, Low Footprint Deep Learning for Robotics**
Nikolaos Passalis, Stefania Pedrazzi, Robert Babuska, Wolfram Burgard, Daniel Dias, Francesco Ferro, Moncef Gabbouj, Ole Green, Alexandros Iosifidis, Erdal Kayacan, Jens Kober, Olivier Michel, N. Nikolaidis, P. Nousi, Roel Pieters, Maria Tzelepi, Abhinav Valada, Anastasios Tefas
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2022
- **Amodal Panoptic Segmentation**
Rohit Mohan, Abhinav Valada
IEEE/ CVF International Conference on Computer Vision and Pattern Recognition (CVPR), 2022
- **Semantic Scene Segmentation for Robotics**
Juana Valeria Hurtado, Abhinav Valada
Deep Learning for Robot Perception and Cognition, CHAPTER 12() PP. 279–311, ACADEMIC PRESS, 2022
- **Robot Skill Adaptation via Soft Actor-Critic Gaussian Mixture Models**
Iman Nematollahi, Erick Rosete-Beas, Adrian Röfer, Tim Welschehold, Abhinav Valada, Wolfram Burgard
IEEE International Conference on Robotics and Automation (ICRA), 2022
- **LCDNet: Deep Loop Closure Detection and Point Cloud Registration for LiDAR SLAM**
Daniele Cattaneo, Matteo Vaghi, Abhinav Valada
IEEE Transactions on Robotics (T-RO), 38(4), PP. 2074–2093, 2022

- **Panoptic nuScenes: A Large-Scale Benchmark for LiDAR Panoptic Segmentation and Tracking**
Whye Kit Fong, Rohit Mohan, Juana Valeria Hurtado, Lubing Zhou, Holger Caesar, Oscar Beijbom, Abhinav Valada
IEEE Robotics and Automation Letters (RA-L), 7(2), pp. 3795–3802, 2022
- **Kineverse: A Symbolic Articulation Model Framework for Model-Agnostic Mobile Manipulation**
Adrian Röfer, Georg Bartels, Abhinav Valada, Michael Beetz
IEEE Robotics and Automation Letters (RA-L), 7(2), pp. 3372–3379, 2022
- **Correct Me if I am Wrong: Interactive Learning for Robotic Manipulation**
Eugenio Chisari, Tim Welschehold, Joschka Boedecker, Wolfram Burgard, Abhinav Valada
IEEE Robotics and Automation Letters (RA-L), 7(2), pp. 3695–3702, 2022
- **Unsupervised Domain Adaptation for LiDAR Panoptic Segmentation**
Borna Bešić, Nikhil Gosala, Daniele Cattaneo, Abhinav Valada
IEEE Robotics and Automation Letters (RA-L), 7(2), pp. 3404–3411, 2022
- **Dynamic Object Removal and Spatio-Temporal RGB-D Inpainting via Geometry-Aware Adversarial Learning**
Borna Besic, Abhinav Valada
IEEE Transactions on Intelligent Vehicles (T-IV), 7(2), pp. 170–185, 2022
- **Bird’s-Eye-View Panoptic Segmentation Using Monocular Frontal View Images**
Nikhil Gosala, Abhinav Valada
IEEE Robotics and Automation Letters (RA-L), 7(2), pp. 1968–1975, 2021
- **EfficientLPS: Efficient LiDAR Panoptic Segmentation**
Kshitij Sirohi, Rohit Mohan, Daniel Büscher, Wolfram Burgard, Abhinav Valada
IEEE Transactions on Robotics (T-RO), 38(3), pp. 1894–1914, 2021
- **Multi-Perspective Anomaly Detection**
Peter Jakob, Manav Madan, Tobias Schmid-Schirling, Abhinav Valada
Sensors, 21(16), 2021
- **Learning Kinematic Feasibility for Mobile Manipulation through Deep Reinforcement Learning**
Daniel Honerkamp, Tim Welschehold, Abhinav Valada
IEEE Robotics and Automation Letters (RA-L), 6(4), pp. 6289–6296, 2021
- **There is More than Meets the Eye: Self-Supervised Multi-Object Detection and Tracking with Sound by Distilling Multimodal Knowledge**
Francisco Rivera Valverde, Juana Valeria Hurtado, Abhinav Valada
IEEE/CVF International Conference on Computer Vision and Pattern Recognition (CVPR), pp. 11612–11621, 2021
- **From Learning to Relearning: A Framework for Diminishing Bias in Social Robot Navigation**
Juana Valeria Hurtado, Laura Londoño, Abhinav Valada
Frontiers in Robotics and AI, 8() p. 650325, 2021
- **EfficientPS: Efficient Panoptic Segmentation**
Rohit Mohan, Abhinav Valada
International Journal of Computer Vision (IJCV), 129(5), pp. 1551–1579, 2021
- **Self-Supervised Visual Terrain Classification from Unsupervised Acoustic Feature Learning**
Jannik Zürn, Wolfram Burgard, Abhinav Valada
IEEE Transactions on Robotics (T-RO), 37(2), pp. 466–481, 2020
- **Multimodal Interaction-aware Motion Prediction for Autonomous Street Crossing**
Noha Radwan, Wolfram Burgard, Abhinav Valada
International Journal of Robotics Research (IJRR), 39(13), pp. 1567–1598, 2020
- **Vision-Based Autonomous UAV Navigation and Landing for Urban Search and Rescue**
Mayank Mittal, Rohit Mohan, Wolfram Burgard, Abhinav Valada
International Symposium on Robotics Research (ISRR), 2019
- **Self-Supervised Model Adaptation for Multimodal Semantic Segmentation**
Abhinav Valada, Rohit Mohan, Wolfram Burgard
International Journal of Computer Vision (IJCV), 128(5), pp. 1239–1285, 2019
- **Robot Localization in Floor Plans using a Room Layout Edge Extraction Network**
Federico Boniardi*, Abhinav Valada*, Rohit Mohan, Tim Caselitz, Wolfram Burgard
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2019
- **VLocNet++: Deep Multitask Learning for Semantic Visual Localization and Odometry**
Noha Radwan, Abhinav Valada, Wolfram Burgard
IEEE Robotics and Automation Letters (RA-L), 3(4), pp. 4407–4414, 2018
- **Deep Auxiliary Learning for Visual Localization and Odometry**
Abhinav Valada*, Noha Radwan*, Wolfram Burgard
IEEE International Conference on Robotics and Automation (ICRA), pp. 6939–6946, 2018

- **Perspectives on Deep Multimodal Robot Learning**
Wolfram Burgard, Abhinav Valada, Noha Radwan, Tayyab Naseer, Jingwei Zhang, Johan Vertens, Oier Mees, Andreas Eitel, Gabriel Oliveira
International Symposium on Robotics Research (ISRR), 2017
- **SMSnet: Semantic Motion Segmentation using Deep Convolutional Neural Networks**
Johan Vertens*, Abhinav Valada*, Wolfram Burgard
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2017
- **AdapNet: Adaptive Semantic Segmentation in Adverse Environmental Conditions**
Abhinav Valada, Johan Vertens, Ankit Dhall, Wolfram Burgard
IEEE International Conference on Robotics and Automation (ICRA), 2017
- **Deep Spatiotemporal Models for Robust Proprioceptive Terrain Classification**
Abhinav Valada, Wolfram Burgard
The International Journal of Robotics Research (IJRR), 36(13-14), PP. 15211–1539, 2017
- **Deep Multispectral Semantic Scene Understanding of Forested Environments Using Multimodal Fusion**
Abhinav Valada, Gabriel L. Oliveira, Thomas Brox, Wolfram Burgard
International Symposium on Experimental Robotics(), PP. 465–477, 2017
- **Deep Learning for Human Part Discovery in Images**
Gabriel Leivas Olivera, Abhinav Valada, Wolfram Burgard, Thomas Brox
IEEE International Conference on Robotics and Automation (ICRA), 2016
- **Autonomous Indoor Robot Navigation Using a Sketch Interface for Drawing Maps and Routes**
Federico Boniardi, Abhinav Valada, Wolfram Burgard, Gian Diego Tipaldi
IEEE International Conference on Robotics and Automation (ICRA), 2016
- **Deep Feature Learning for Acoustics-based Terrain Classification**
Abhinav Valada, Luciano Spinello, Wolfram Burgard
International Symposium on Robotics Research, 2() PP. 21–37, 2015, (SELECTED IN TOP 10)
- **Planning Efficient Paths through Dynamic Flow Fields in Real World Domains**
Christopher Tomaszewski, Abhinav Valada, Paul Scerri
MTS/IEEE OCEANS, 2013
- **An Intelligent Approach to Hysteresis Compensation while Sampling using a Fleet of Autonomous Watercraft**
Abhinav Valada, Christopher Tomaszewski, Balajee Kannan, Prasanna Velagapudi, George A Kantor, Paul Scerri
International Conference on Intelligent Robotics and Applications (ICIRA), 2012
- **Automation of Hydroponic Installations using a Robot with Position Based Visual Feedback**
Niels Tanke, Guoming Alex Long, Dhruv Agrawal, Abhinav Valada, George A Kantor
International Conference of Agricultural Engineering (CIGR-Ageng), 2012
- **Base Station Design and Architecture for Wireless Sensor Networks**
David Kohanbash, Abhinav Valada, George A Kantor
International Conference of Agricultural Engineering (CIGR-Ageng), 2012
- **Development of a Low Cost Multi-Robot Autonomous Marine Surface Platform**
Abhinav Valada, Prasanna Velagapudi, Balajee Kannan, Christopher Tomaszewski, George A Kantor, Paul Scerri
International Conference on Field and Service Robotics (FSR), 2012
- **Real-World Testing of a Multi-Robot Team**
Paul Scerri, Prasanna Velagapudi, Balajee Kannan, Abhinav Valada, Christopher Tomaszewski, John M Dolan, Adrian Scerri, Kumar Shaurya Shankar, Luis Lorenzo Bill-Clark, George A Kantor
11th International Conference on Autonomous Agents and Multiagent Systems (AAMAS), 2012
- **DSRP: Distributed SensorWeb Routing Protocol**
Abhinav Valada, David Kohanbash, George A Kantor
21st International Conference on Electronics, Communications and Computers (CONIELECOMP), 2011
- **Development of a Distributed Wireless Sensing System for Agriculture**
David Kohanbash, Abhinav Valada, George A Kantor
International Symposium on Wireless Sensor Network for Agriculture, 2012

Peer-Reviewed Workshop Papers

- **Learning Lane Graphs from Aerial Imagery Using Transformers**
Simon Dorer Martin Büchner, Abhinav Valada
Robotics: Science and Systems Workshop on Autonomous Vehicles Across Scales(), 2024
- **Imagine2touch: Predictive Tactile Sensing for Robotic Manipulation using Efficient Low-Dimensional Signals**
Abdallah Ayman, Adrian Röfer, Nick Heppert, Abhinav Valada
IEEE International Conference on Robotics and Automation Workshop on Robot Embodiment through Visuo-Tactile Perception(), 2024
- **CenterArt: Joint Shape Reconstruction and 6-DoF Grasp Estimation of Articulated Objects**
Sassan Mokhtar, Eugenio Chisari, Nick Heppert, Abhinav Valada
IEEE International Conference on Robotics and Automation Workshop on 3D Visual Representations for Robot Manipulation(), 2024

- **CoVIO: Online Continual Learning for Visual-Inertial Odometry**
Niclas Vödisch, Daniele Cattaneo, Wolfram Burgard, Abhinav Valada
IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) Workshops, 2023
- **Active Particle Filter Networks: Efficient Active Localization in Continuous Action Spaces and Large Maps**
Daniel Honerkamp, Suresh Guttikonda, Abhinav Valada
IEEE/RSJ International Conference on Intelligent Robots and Systems Workshop on Probabilistic Robotics in the Age of Deep Learning(), 2022
- **Self-Supervised Learning of Multi-Object Keypoints for Robotic Manipulation**
Jan Ole Hartz, Eugenio Chisari, Tim Welschehold, Abhinav Valada
IEEE International Conference on Robotics and Automation Workshop on Reinforcement Learning for Contact-Rich Manipulation(), 2022
- **Doing Right by Not Doing Wrong in Human-Robot Collaboration**
Laura Londoño, Adrian Röfer, Tim Welschehold, Abhinav Valada
ACM/IEEE International Conference on Human-Robot Interaction Workshop on Fairness and Transparency in Human-Robot Interaction(), 2022
- **7th AI Driving Olympics: 1st Place Report for Panoptic Tracking**
Rohit Mohan, Abhinav Valada
Conference on Neural Information Processing Systems (NeurIPS 2021) Workshop on AI Driving Olympics, 2021
- **Robust Vision Challenge 2020 - 1st Place Report for Panoptic Segmentation**
Rohit Mohan, Abhinav Valada
European Conference on Computer Vision (ECCV) Workshop on Robust Vision Challenge(), 2020
- **CMRNet++: Map and Camera Agnostic Monocular Visual Localization in LiDAR Maps**
Daniele Cattaneo, Domenico Giorgio Sorrenti, Abhinav Valada
IEEE International Conference on Robotics and Automation (ICRA) Workshop on Emerging Learning and Algorithmic Methods for Data Association in Robotics, 2020
- **MOPT: Multi-Object Panoptic Tracking**
Juana Valeria Hurtado, Rohit Mohan, Wolfram Burgard, Abhinav Valada
The IEEE Conference on Computer Vision and Pattern Recognition (CVPR) Workshop on Scalability in Autonomous Driving, 2020
- **Vision-based Autonomous Landing in Catastrophe-Struck Environments**
Mayank Mittal*, Abhinav Valada*, Wolfram Burgard
Workshop on Vision-based Drones: What's Next? at the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2018
- **Incorporating Semantic and Geometric Priors in Deep Pose Regression**
Abhinav Valada*, Noha Radwan*, Wolfram Burgard
Workshop on Learning and Inference in Robotics: Integrating Structure, Priors and Models at Robotics: Science and Systems (RSS), 2018
- **Learning Reliable and Scalable Representations Using Multimodal Multitask Deep Learning**
Abhinav Valada, Wolfram Burgard
RSS Pioneers at Robotics: Science and Systems (RSS), 2018
- **Convolved Mixture of Deep Experts for Robust Semantic Segmentation**
Abhinav Valada, Ankit Dhall, Wolfram Burgard
Workshop on State Estimation and Terrain Perception for All Terrain Mobile Robots at IEEE International Conference on Intelligent Robots and Systems (IROS), 2016
- **Towards Robust Semantic Segmentation using Deep Fusion**
Abhinav Valada, Gabriel Leivas Olivera, Thomas Brox, Wolfram Burgard
Workshop on Limits and Potentials of Deep Learning in Robotics at Robotics: Science and Systems (RSS), 2016
- **Autonomous Indoor Robot Navigation Using Sketched Maps and Routes**
Federico Boniardi, Abhinav Valada, Wolfram Burgard, Gian Diego Tipaldi
Workshop on Model Learning for Human-Robot Communication at Robotics: Science and Systems (RSS), 2015
- **Visual Obstacle Avoidance for Autonomous Watercraft using Smartphones**
Tarek El-Gaaly, Christopher Tomaszewski, Abhinav Valada, Prasanna Velagapudi, Balajee Kannan, Paul Scerri
Autonomous Robots and Multirobot Systems workshop (ARMS, at AAMAS), 2013
- **Irrigation Control Methods for Wireless Sensor Network**
David Kohanbash, Abhinav Valada, George A Kantor
American Society of Agricultural and Biological Engineers (ASABE) Annual Meeting, 2012
- **Real-World Testing of a Multi-Robot Team**
Paul Scerri, Prasanna Velagapudi, Balajee Kannan, Abhinav Valada, Christopher Tomaszewski, John M Dolan, Adrian Scerri, Kumar Shaurya Shankar, Luis Lorenzo Bill-Clark, George A Kantor
Autonomous Robots and Multi-Robot Systems Workshop at the 11th International Conference on Autonomous Agents and Multiagent Systems (AAMAS), 2012
- **Wireless Sensor Networks and Actionable Modeling for Intelligent Irrigation**
David Kohanbash, Abhinav Valada, George A Kantor
American Society of Agricultural and Biological Engineers (ASABE) Annual Meeting, 2011

Other Publications

- **Discovering and Leveraging Deep Multimodal Structure for Reliable Robot Perception and Localization**
Abhinav Valada
PhD Thesis, University of Freiburg, Department of Computer Science, doi: 10.6094/UNIFR/17427, 2019
- **An Autonomous Robot for Manipulation and Mapping of Hydroponic NFT Installations**
Abhinav Valada

- Design and Development of a Wireless Sensor Network System for Precision Agriculture

Abhinav Valada

BTech Thesis, Tech. rep. CMU-RI-TR-10-21, Carnegie Mellon University, Robotics Institute, 2010

Selected Media Coverage

The ImageNet moment of robotics

Towards Safer and More Robust Automated Driving Systems

Next generation of AI algorithms for automated driving

Next generation of AI algorithms for automated driving

Künstliche Intelligenz zum Anfassen

Diese Drohne soll Erdbeben-Opfer retten

Drohnen Übung für den Ernstfalls

How AI Helps Self-Driving Cars Perceive Objects

How AI can help autonomous vehicles perceive objects

Autonome Autos können ihre Umgebung menschlicher wahrnehmen

Autonome Autos können ihre Umgebung menschlicher wahrnehmen

Mit KI die Umgebungserkennung autonomer Fahrzeuge verbessern

Mit KI die Umgebungserkennung autonomer Fahrzeuge verbessern

Human-Like Perception for Self-Driving Cars

Auf dem Weg zu einer menschenähnlichen Wahrnehmung für selbstfahrende Autos

Auf dem Weg zu menschenähnlicher Wahrnehmung für selbstfahrende Autos

Autonomous Vehicles With Human-like Vision

Human-Like Awareness Emerging in Self-Driving Vehicles

Advancing human-like perception in self-driving vehicles

Unlocking Human-Like Perception In Self-Driving Vehicles

University Of Freiburg: Step By Step Toward Safe Autonomous Driving

Step by Step Toward Safe Autonomous Driving

Advanced AI Model Enables Coherent Scene Recognition for Autonomous Vehicles

Deep Learning: Wie selbstfahrende Autos Szenen besser verstehen

New deep analysis breaks information in picture recognition capacity of self-driving automobiles

AI Model Enhances Image Recognition Ability Of Self-Driving Cars

Advanced AI Model Enables Coherent Scene Recognition for Autonomous Vehicles

Neues KI-Modell verbessert die Umfelderkennung

Deep learning method improves environment perception of self-driving cars

Neue Methoden des Deep Learning

EfficientPS: New State-of-the-art Model in Panoptic Segmentation

Faster and more effective scene understanding

Faster and more effective scene understanding

Freiburger Forscherteam besser als Google

New deep learning research breaks records in image recognition ability of self-driving cars

Faster and more effective scene understanding

New deep learning research breaks records in image recognition ability of self-driving cars

FOUNT² – Einsatz für die Wissenschaft

Robotic Crocodiles

Autonomous airboats monitor hippo dung in Kenya's Mara River basin

Crocodile Robot Dodges Hippo ... for Science!

Robots: A Fun Context for Learning

For Surveying Dangerous Hippo Pools, Platypus Robots Go Where People Can't

Dirty and Dangerous

Platypus Floats Idea of Affordable Environmental Robotics

Cooperative Robotic Watercraft

CMU's Team Develops Environmental Robotics

CMU Startup Adds Robotics to Water

Industrial AI Podcast, 2023

AZO Robotics, 2023

EurekAlert, 2023

Mirage News, 2023

Baden TV Süd, 2023

Bild, 2023

RTL News, 2023

Springer Professional, 2023

The Economic Times, 2023

Motor Zeitung, 2023

auto-medienportal, 2023

It-daily, 2023

AI Society, 2023

elektroniknet, 2023

bavaria-press, 2022

RegioTrends, 2022

electronicsforum, 2022

AZO Robotics, 2022

TechXplore, 2022

Autotech News, 2022

India Education Diary, 2021

Uni Freiburg Magazine, 2021

selfdrivingcars360, 2020

autocad-magazin, 2020

news8plus, 2020

pioneeringminds, 2020

azorobotics, 2020

Springer Professional, 2020

eenewsautomotive, 2020

intellicar, 2020

Neurohive, 2020

EurekAlert, 2020

News Break, 2020

elektroniknet, 2020

innovations report, 2020

Miragenews, 2020

TechXplore, 2020

Technisches Hilfswerk, 2019

Discovery Channel, 2015

ScienceDaily, 2014

NBC News, 2014

Grow a Generation, 2014

Environmental Monitor, 2014

Cary Institute, 2014

Business Times, 2012

Robots.net, 2012

Business Journal, 2012

Pittsburgh Business Times, 2012