Daniele **De Martini** PhD, MIEEE

Associate Professor in Mobile Robotics @ Oxford Robotics Institute & Oxford e-Research Centre

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Research Interests

Research Vision I pioneer **site-driven robotics**. My work departs from traditional robot-centric autonomy by treating the *site* as the primary actor and emphasizing infrastructure–robot co-design. I leverage existing site infrastructure (e.g., CCTV, communications, edge/cloud compute), combined with minimal targeted augmentation (such as sparse markers), to enable reliable operation of simple robots in legacy, human-shared environments—without full site redesign. This *Site-as-the-Actor* approach bridges perception, cyber–physical systems, and human–robot interaction, enabling rapid, low-cost deployment of autonomous systems in critical infrastructure including warehousing, healthcare, and energy.

Research Interests Multimodal perception leveraging site infrastructure (CCTV, edge compute, communications, etc) • Robot-infrastructure interplay and co-design for safety-critical shared spaces • Long-term autonomy and adaptation in dynamic human environments.

Application interests Autonomous logistics & warehouse automation (intra-facility navigation, pick-and-place) • Healthcare robotics (hospital navigation, sterile environments, human safety) • Energy infrastructure (inspection, monitoring, maintenance in constrained spaces)

Employment

University of Oxford - Oxford Robotics Institute & Oxford e-Research Centre — Oxford, UK
Associate Professor in Mobile Robotics — 10/2025 – Ongoing

University of Oxford - Keble College — Oxford, UK
Tutorial Fellow — 10/2025 – Ongoing

University of Oxford - Oxford Robotics Institute — Oxford, UK
Departmental Lecturer in Mobile Robotics — 10/2023 – 10/2025

University of Oxford - Pembroke College — Oxford, UK
Part-time Stipendiary College Lecturer — 09/2022 – 10/2025

Frontier Development Lab — Virtual
Faculty in the Virgil2.0 Team — 06/2024 – 08/2024

- Development of algorithms for providing advance warnings of hazardous solar eruptions

University of Oxford - Oxford Robotics Institute — Oxford, UK
PostDoctoral Research Assistant — 05/2018 – 10/2023

- Developed algorithms for robust odometry/localisation using radar
- Applied ML for environment understanding
- Explored robot–infrastructure interplay

University of Oxford - Kellogg College — Oxford, UK
Junior Research Fellow — 10/2019 – 09/2022

Frontier Development Lab — Virtual
Researcher in the Machine-Learning-Payloads Team — 06/2021 – 08/2021

- Development of algorithms for unsupervised change detection on satellite data through Machine Learning techniques for downlink prioritisation

Frontier Development Lab — Virtual
Researcher in the Digital-Twin-Earth Team — 06/2020 – 08/2020

- Development of algorithms for precipitation forecasts through Machine Learning techniques

FCA — Torino, Italy
Engineer Specialist in the R&D chassis group — 04/2014 – 01/2015

- Multibody design and analysis of suspensions
- Constrained optimization of suspension springs

Education

Università degli Studi di Pavia — Pavia, Italy
Ph.D. student — 02/2015 – 01/2018 (awarded Dec 2018)

- Supervisor: Tullio Facchinetti
- Thesis: *Actuator Management of a Quadcopter with Double-Axis Tilting Rotors*

University of New Brunswick — Fredericton, Canada
Visiting Ph.D. student — 10/2016 – 03/2017

- Supervisor: Howard Li

Politecnico di Torino — Torino, Italy
M.Sc. in Mechatronics Engineering — 09/2011 – 12/2013

- Supervisor: Giancarlo Genta
- Collaboration with Mediamotive
- Thesis: *Design of a VTOL UAV* (final mark: 110/110)

Università degli Studi di Pavia — Pavia, Italy
B.Sc. in Mechanical Engineering — 09/2008 – 09/2011

- Supervisor: Carlo Rottenbacher
- Thesis: *200 m K1 kayak race simulation: cinematic and dynamic analysis and physiological aspects* (final mark: 110/110)

Grants, Funding and Awards

Funding leadership: £360k as PI (independently led grants). Funding experience: £6.6M as co-I/contributing writer, including theme/work-package leadership roles within larger programmes.

NVIDIA Academic Grant Program – Generative AI and adversarial search to prevent robot failures — 2026
PI and main writer — Equipment ∼40k £

Keble College Research Support Scheme – Data-sharing infrastructure — 2026
PI and main writer — 3k £

Oxford UCSF – Inverted Automation: hyper-low-cost, scalable warehouse automation — 2026
PI and main writer — 96k £

InnovateUK – A general-purpose configuration management system validated in automated logistics — 2025
PI and main writer, led by Omniscient ltd — 130k £ (total 500k £)

EPSRC IAA – Robotic Inversion for Smart Logistics — 2024 – 2025
PI and main writer — 86.5k £

EPSRC IAA – RobotCycle, Mapping and Understanding Road Infrastructure and Road User Behaviour — 2024
Main writer, Co-I, additional funds — 24k £

EPSRC IAA – Autonomous Inspection for Environmental Impact and Sustainability Monitoring — 2022 – 2023
Contributing writer, named researcher — 240k £

EPSRC PG – From sensing to collaboration — 2021 – 2026
Contributing writer for the Navigation theme and the Agriculture flagship — 1M £ (6M £ total, 6 PIs)

Assuring Autonomy – Sense-Assess-eXplain — 2019 – 2021
Contributing writer and Researcher Co-Investigator — 314k £

Visiting Student – University of New Brunswick — 2016 – 2017
Visiting PhD student, Fredericton, Canada — 3k €

Ph.D. Italian Scholarship – University of Pavia — 2015 – 2018
Funded PhD school of Engineering — 36k €

Teaching Experience

Graduate departmental teaching
University of Oxford, Centre of Doctoral Studies AIMS, robotics week orgniser — 2025 – Ongoing
University of Oxford, MSc in Autonomous Robotics, Robotics Group project — Launching 2026

University of Oxford, MSc in Autonomous Robotics, Autonomous Robotics Systems — Launching 2026

Undergraduate departmental teaching

University of Oxford, *B3 – third-year group project* on *System and Software Design of a Multiagent Aerial Robotic System* — 2023 – Ongoing
University of Oxford, *B16 – software engineering* laboratory organiser — 2023 – Ongoing

Undergraduate college teaching

University of Oxford, *P1 – Mathematics* tutorials @ Keble College — 2025 – Ongoing
University of Oxford, *A2 – Electronic and Information Engineering* tutorials @ Keble College — 2025 – Ongoing
University of Oxford, *A3 – Structures, Materials and Dynamics* tutorials @ Keble College — 2025 – Ongoing
University of Oxford, *P3 – Structures and Mechanics* tutorials @ Pembroke College — 2022 – 2025

Teaching Assistant

University of Oxford, Lead Tutor for *B16 – software engineering* tutorials — 2023 – 2025
University of Oxford, *B16 – software engineering* tutorials — 2021 – 2025

Laboratory Supervision

University of Oxford, *B16 – software engineering* laboratory demonstrations — 2018 – 2023
University of Oxford, *P5 – computing* laboratory demonstrations — 2018 – 2022
University of Oxford, *Robotics* Laboratory demonstrations — 2018 – 2019
Università degli Studi di Pavia, C programming fundamentals — 2015 – 2017
Università degli Studi di Pavia, lab supervision in Prof. Facchinetti's *Robotics* course — 2015 – 2017

Invited Lectureship

Aalborg University (DK), invited lecture on *robot sensors* in Prof. Marchegiani's *Robot Navigation* course — 2021
Università degli Studi di Parma (IT), invited lecture on *satellite imagery as a robotic sensor* in Prof. Marchegiani's *3D Perception and Learning-based Data Fusion* course — 2023

Other

University of Oxford, mentoring for MSc and PhD students @ Keble College — 2025 – Ongoing
University of Oxford, mentoring for MSc and PhD students @ Pembroke College — 2024 – 2025
University of Oxford, mentoring for MSc and PhD students @ Kellogg College — 2019 – 2022
University of Oxford, Associate Fellow of the Higher Education Academy — 2021
University of Oxford, PAT (Physics Aptitude Test) marker — 2020
Università degli Studi di Pavia, Co-supervision of B.Sc. and M.Sc. students thesis — 2016 – 2017

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IP co-inventor : *Precise Ego-Motion Estimation and Localisation for Automotive Scanning Radars* — 2018

IP co-inventor : *NeRFloors: Conditional street-level scene generation from Bird's Eye View semantic maps via Neural Radiance Fields* — 2023

Patent co-inventor : *NeRFloors: Conditional street-level scene generation from BEV (Bird's Eye View) semantic maps via NeRF (Neural Radiance Fields)* — 2023 [filed]

🏛 Scientific Leadership & Community Service

Editorial Role: Associate Editor @ *Robotics and Automation Letters* (RAL) (2024 – 2025) • Guest Editor @ Special Issue on *Trust through eXplAInability (XAI), Robustness and Verification of Autonomous Systems @ IET Radar, Sonar & Navigation* (2024) • Associate Editor @ *Intelligent Vehicles Symposium* (IV) (2024 – 2025) • Associate Editor @ *International Conference on Intelligent Transportation Systems* (ITSC) (2019 – 2024) • Associate Editor @ *International Conference on Robotics and Automation* (ICRA) (2021 – 2022)

Chair: *International Conference on Intelligent Robots and Systems* (IROS) (2022, 2025) • *International Conference on Robotics and Automation* (ICRA) (2022, 2024) • *International Conference on Intelligent Transportation Systems* (ITSC) (2019)

Organising committee: Workshop on *The More the Better: Multimodal Perception for Safer Autonomous Navigation* at @ *Conference on Automation Science and Engineering* (CASE) (2025) • Industry panel on *Future Telecommunication Infrastructure and Robotics for Safety-Critical Industries and Services: Industry Demands, Safety Requirements, Technical Challenges & Solution, and Economics* @ *International Conference on Communications* (ICC) (2025) • Tutorial on *Emerging Technologies, 5G and Beyond: Task-oriented Co-design of Sensing, Communication, and Control for Cyber-Physical Systems* @ *Vehicular Technology Conference* (VTC) (2025) • Special session on *SS26: Human-Centred Intelligent Systems* @ *Iternational Conference on Industrial Technology* (ICIT) (2024) • Workshop on *Beyond Traditional*

Sensing for Intelligent Transportation @ *International Conference on Intelligent Transportation Systems* (ITSC) (2023) • Special session on *Beyond Traditional Sensing for Intelligent Transportation* @ *International Conference on Intelligent Transportation Systems* (ITSC) (2019 – 2022) • Tutorial session on *Self-Supervision on Wheels* @ *European Conference on Computer Vision* (ECCV) (2022)

Program committee: *Association for the Advancement of Artificial Intelligence* (AAAI) (2024-2025) • *International Conference on Emerging Technologies and Factory Automation* (ETFA) (2019 – 2023) • *International Conference on Agents and Artificial Intelligence* (ICAART) (2019 – 2020) • *International Joint Conference on Artificial Intelligence – Pacific Rim International Conference on Artificial Intelligence* (IJCAI-PRICAI) (2020) • *European Conference on Artificial Intelligence* (ECAI) (2020)

Other reviewing activity: *Robotics and Automation Letters (RA-L)* • *Autonomous Robots (Auro)* • *Transaction on Robotics (T-RO)* • *Intelligent Vehicles Symposium* (IV) • *International Conference on Intelligent Transportation Systems* (ITSC) • *International Conference on Intelligent Robots and Systems* (IROS) • *IEEE Transactions on Mechatronics* • *Nature Machine Intelligence* • *MDPI Actuators* • *Manning Publications* • *International Symposium on Experimental Robotics* (ISER) • *International Conference on Industrial Cyber-Physical Systems* (ICPS) • *International Conference on Industrial Electronics for Sustainable Energy Systems* (IESES) • *International Conference on Cyber-Physical Systems* (ICCPS) • *World Scientific*

Memberships IEEE Membership (since 2018) • IEEE Intelligent Transportation Systems Society Membership (since 2019) • IEEE Robotics and Automation Society (since 2022) • UK Research and Innovation Early Career Researcher Forum (since 2021) • Associate Fellow of AdvanceHE, UK-based society fostering higher-education quality (since 2021)

Other UK-RAS Network representative for the University of Oxford • EPSRC Peer Review College

Invited Talks and Public Engagement

2025 Invited talk at Zhejiang University

2025 Lecture at the Keble Alumni Reunion – Do Robots Really Need to Be Embodied?

2025 Invited talk at the Polytechnic of Montreal – Robotics Inversion: Leveraging Cloud and IoT for Control of Heterogeneous Robot Fleets at Ultra-Low Cost

2025 Organiser and panellist at the industrial panel "Future Telecommunication Infrastructure and Robotics for Safety-Critical Industries and Services: Industry Demands, Safety Requirements, Technical Challenges & Solution, and Economics" at the IEEE International Conference on Communications

2025 Organiser and presenter at the tutorial "Emerging Technologies, 5G and Beyond: Task-oriented Co-design of Sensing, Communication, and Control for Cyber-Physical Systems" at the IEEE Vehicular Technology Conference

2025 Invited talk at the event *Harnessing Embodied Intelligence for Defence & Security in Hazardous Environments*

2024 Invited talk at the University of Freiburg (remote) – FMCW Radar, from Off-Road to Doppler

2024 IEEE UK and Ireland Robotics and Automation Society Webinar – FMCW Radar, What's Next? From Off-Road to Doppler (tinyurl.com/3rnuk9r5)

2024 Invited to talk at the workshop *Radar in Robotics: Resilience from Signal to Navigation* @ ICRA (tinyurl.com/35y5xk64)

2022 Exhibitor at the University of Oxford stand at the *Amazon AWS summit* (go.aws/38Ar32t)

2021 Featured in *Autonomous Zone* on *Landrover Owner International*

2021 Presenter at the FDL 2021 Space Science & AI Showcase (bit.ly/3DbjkIN)

2021 Presenter at the SETILive event (bit.ly/3Ao3j9M)

2021 Exibitor at the ORI stand at the *Goodwood: festival of speed* (bit.ly/3fC6YZG)

2021 Featured in *Robot "training" on famous Highland estate will make driverless vehicles more reliable* (https://bit.ly/3zEUwl9)

2020 Presenter at the FDL 2020 Space Science & AI Showcase (bit.ly/3sgTYha)

2019 Invited talk *Condition-independent perception and navigation of complex urban environments with vision and radar*, *Robust and Generalisable Vehicle Automation* workshop @ *International Conference on Intelligent Transportation Systems* (ITSC)

2019 Invited talk *Overview of Deep Learning based Perception and Navigation at Oxford Robotics Institute*, *Deep learning for Automated Driving: Beyond Perception* workshop @ *International Conference on Intelligent Transportation Systems* (ITSC)

2019 Presenter in an internal event for members of the UK Department for Business, Energy and Industrial Strategy (BEIS)

Mentoring

Here is a list of students and PDRAs I have mentored since my PhD. The publications column lists the publications below.

		Name	Primary Advisor	Publications	Dates	After graduation
University of Oxford	PDRA	Benjamin Ramtoula	–		2025 –	–
	PhD	Kyuhwan Yeon	D. De Martini		2025 –	–
		Kevin Tan	D. De Martini		2025 –	–
		Sitian Shen[1]	D. De Martini	O3	2024 –	–
		Halil Kelebek	D. De Martini		2024 –	–
		Divya Thuremella	D. De Martini	J21 C43	2024 –	–
		Jianhao Yuan[2]	D. De Martini	J19 C45	2023 –	–
		Luke Robinson[3]	D. De Martini	C29 C32 W16 J23 J25	2021 – 2026	PDRA @ Oxford
		Benjamin Ramtoula	P. Newman	C26 C30 C35 J24	2021 – 2025	PDRA @ Oxford
		Efimia Panagiotaki	D. De Martini	W17 W11 C33 C34 C38 W14 J21 C41 O1	2021 – 2026	–
		Georgi Pramatarov	P. Newman	C24 C36	2020 –	–
		Valentina Musat	P. Newman	C23 J15 C39	2020 – 2025	OXA
		David Williams	P. Newman	C18 C30 C37 J16	2019 – 2024	GSK
		Luigi Campanaro	I. Havoutis	C20 C27	2018 – 2023	PDRA @ OpenUniversity
		Tim Tang[4]	P. Newman	C15 C19 J4 J9 J14 C28	2018 – 2023	Stack AV
		Roberto Aldera	P. Newman	C6 C7 J10	2017 – 2022	Thinkst Applied Research
	MPhil	Samuel Sze	L. Kunze	J21 C42	2024 – 2025	A*STAR
	Visiting	François Pomerlau (Prof)	–		2026	–
		Monica Li (PhD)[5]	PY. Lajoie		2026	–
		Effie Daum (PhD)	F. Pomerlau		2026	–
		Jean-Michel Fortin (PhD)	F. Pomerlau		2026	–
		Giorgia Modi (MSc)	G. Averta		2025 – 2026	–
		Henry Lema (MSc)	A. Valada		2025	–
		Santosh Parit (MSc)	A. Valada		2025	–
		Felix de Trogoff (MSc)	E. Frazzoli		2025	French Navy
		Julia Hindel (ELLIS PhD)	A. Valada		2024 – 2025	–
		Luigi Campanaro (PDRA)	A. Bennaceur		2024 – 2025	PDRA @ EPFL
		Juan José Cabrera Mora (PhD)	A. Aparicio		2024	–
		Pierre-Yves Lajole (PhD)[6]	G. Beltrame	J24 C44	2024	AP @ Montreal
		Davide Buoso (MSc)[7]	P. Torr	J23	2024	PhD @ Turin
	CDT	Benjamin Ramtoula	P. Newman		2021	PhD @ Oxford
		Dominik Kloepfer	P. Newman		2021	PhD @ Oxford
		Prannay Kaul	P. Newman	C13	2019	PhD @ Oxford
	4Y	Jaihkun Kim	D. De Martini		2025	–
		Jonathan Soepadmo	D. De Martini		2025	–
		Yiming Yang	P. Newman		2024	–
		Manshika Charvi Bissessur	D. De Martini	W17	2024	PhD @ Oxford
		Jincheng You	D. De Martini		2024	–
		Jie Li	D. De Martini		2024	–
		Cecilia Villalpando	D. De Martini		2024	–
		Arnav Tyagi	Oiwi Parker-Jones		2024	–
		Daoxin Zhong	D. De Martini	W16	2023	A*STAR PhD
		Fraser Rennie	D. De Martini	C30	2022	Amazon UK
		Yang Hou	P. Newman		2022	–

[1] Internship @ NVIDIA
[2] Internship @ Amazon and Meta
[3] Internship @ Nokia Bell Labs
[5] Mitacs Globalink Research Scholarship
[6] Mitacs Globalink Research Scholarship
[7] Best MSc thesis CVPL award

		Name	Primary Advisor	Publications	Dates	After graduation
		Pawit Kochakarn	L. Kunze	C25	2021	Ocado UK
		Matthew Widojo	P. Newman	J18	2021	Oxa
		Chris Parsons	P. Maiolino	J11	2021	Cambridge Consultants
		Jin Yeob Chung	P. Newman		2020	–
		Zhaoyu Wang	P. Newman		2019	–
		Michael Broome	P. Newman	J8	2019	Hawk-Eye Innovations
		David Williams	P. Newman	W1 C14	2018	PhD @ Oxford
	Interns	Jaihkun Kim[8]	D. De Martini		2025	–
		Matthew Widojo	P. Newman		2020	OXA
		Alex Goldie	P. Newman		2021	CDT @ Oxford
		Thibaut Hurson	L. Kunze		2021	–
Università degli Studi di Pavia	MSc	Filippo Cipolla	T. Facchinetti		2018	Zucchetti
		Andrea Bonandin	T. Facchinetti	C16	2018	Ariadne
		Federica Amato	T. Facchinetti		2018	Ariadne
		Andrea Torlaschi	T. Facchinetti		2017	–
		Simone Colucci	T. Facchinetti		2017	XTream
		Davide Giuffrida	T. Facchinetti		2017	PhD @ UniPV
		Giuseppe Gramazio	T. Facchinetti	J2	2017	Salesforce
		Alessandro Bertini	T. Facchinetti	C1 J2	2016	IrisCube
	BSc	Yatin Bhutani	T. Facchinetti		2017	MSc @ UniPV
		Daniele Speciale	C. Rottenbacher		2016	–
		Stefano Azzalini	C. Rottenbacher		2016	–
		Andrea Bonandin	T. Facchinetti	C3	2016	MSc @ UniPV
		Filippo Cipolla	T. Facchinetti	C2	2016	MSc @ UniPV
		Emilio Marzorati	C. Rottenbacher		2015	-
		Luca Strobino	C. Rottenbacher		2015	MSc @ PoliMI

[8] EPSRC Vacation scholarship

Publication List

* in the author list stands for equal contribution.

Peer-reviewed journal articles:

J26 M. Qi, M. Gadd, **D. De Martini**, KJ. Davis, B. Xiong, A. Rosen, N. Hawes and R. Salguero-Gómez. Biodiversity research requires more motors in air, water and on land. Methods in Ecology and Evolution, 2025.

J25 L. Robinson, M. Gadd, P. Newman and **D. De Martini**. Robot-Relay: Building-Wide, Calibration-Less Visual Servoing with Learned Sensor Handover Networks. Autonomous Robots (AuRo), 2025.

J24 PY. Lajoie, B. Ramtoula, **D. De Martini**, G. Beltrame. 3D Foundation Model-Based Loop Closing for Decentralized Collaborative SLAM. *IEEE Robotics and Automation Letters*, 2025. Presented at the *International Conference on Robotics and Automation (ICRA)*, 2026.

J23 D. Buoso, L. Robinson, G. Averta, P. Torr, T. Franzmeyer* and **D. De Martini***. Select2Plan: Training-Free ICL-Based Planning through VQA and Memory Retrieval. *IEEE Robotics and Automation Letters*, 2025. Presented at the *International Conference on Robotics and Automation (ICRA)*, 2026.

J22 M. Staniaszek, T. Flatscher, J. Rowell, H. Niu, W. Liu, Y. You, M. Gadd, M. Mattamala, A. Schutz, **D. De Martini**, L. Pitt, R. Skilton, M. Fallon, N. Hawes. AutoInspect: Towards Long-Term Autonomous Inspection and Monitoring. *IEEE Transactions on Field Robotics*, 2025.

J21 E. Panagiotaki, D. Thuremella, J. Baghabrah, S. Sze, L. F. Tarimo Fu, B. Hardin, T. Reinmund, T. Flatscher, D. Marques, C. Prahacs, L. Kunze, **D. De Martini**. The Oxford RobotCycle Project: A Multimodal Urban Cycling Dataset for Assessing the Safety of Vulnerable Road Users. *IEEE Transactions on Field Robotics*, 2025. Presented at the *UK AI Research Symposium*, 2025, and at the *International Conference on Intelligent Robots and Systems (IROS)*, 2025.

J20 Y. Diao, Y. Zhang, **D. De Martini**, P. Zhao, E. Li. Task-Oriented Co-Design of Communication, Computing, and Control for Edge-Enabled Industrial Cyber-Physical Systems. *IEEE Journal on Selected Areas in Communications*, 2025.

J19 S. Agarwal, J. Yuan, P.I Newman, **D. De Martini**, M. Gadd. Bayesian Radar Cosplace: Directly Estimating Location Uncertainty in Radar Place Recognition. *in IET Radar, Sonar & Navigation*, 2025.

J18 M. Gadd, **D. De Martini**, O. Bartlett, P. Murcutt, M. Towlson, M. Widojo, V. Mușat, L. Robinson, E. Panagiotaki, G. Pramatarov, M. Kühn, L. Marchegiani, P. Newman, and L. Kunze. OORD: The Oxford Offroad Radar Dataset. *Intelligent Transportation Systems Transactions*, 2024. Presented at the *International Conference on Robotics and Automation (ICRA)*, 2024.

J17 **D. De Martini**, G. Benetti and T. Facchinetti. Real-time cyber/physical interplay in scheduling for peak load optimization in Cyber-Physical Energy Systems. *Intelligent Systems with Applications*, 2024.

J16 D. Williams, **D. De Martini**, M. Gadd and P. Newman. Mitigating Distributional Shift in Semantic Segmentation via Uncertainty Estimation from Unlabelled Data. *Transaction on Robotics*, 2024. Presented at the *40th Anniversary of the IEEE Conference on Robotics and Automation (ICRA@40)*, 2024.

J15 V. Mușat, **D. De Martini***, M. Gadd* and P. Newman. NeuralFloors: Conditional street-level scene generation from BEV semantic maps via Neural Fields. *IEEE Robotics and Automation Letters*, 2023. Presented at the *40th Anniversary of the IEEE Conference on Robotics and Automation (ICRA@40)*, 2024.

J14 T. Y. Tang, **D. De Martini**, and P. Newman. Point-based Metric and Topological Localisation between Lidar and Overhead Imagery. *Autonomous Robots (AURO)*, 2023.

J13 Z. Meng, C. She, G. Zhao, and **D. De Martini**. Sampling, Communication, and Prediction Co-Design for Synchronizing the Real-World Device and Digital Model in Metaverse. *IEEE Journal on Selected Areas in Communications*, 2023.

J12 V. Růžička, A. Vaughan, **D. De Martini**, J. Fulton, V. Salvatelli, C. Bridges, G. Mateo-Garcia, and V. Zantedeschi. RaVÆn: unsupervised change detection of extreme events using ML on-board satellites. *Nature Scientific Reports*, 2022.

J11 C. Parsons, A. Albini, **D. De Martini** and P. Maiolino. Visuo-Tactile Recognition of Partial Point Clouds Using PointNet and Curriculum Learning: Enabling Tactile Perception from Visual Data. *IEEE Robotics & Automation Magazine*, 2022. Presented at the *International Conference on Robotics and Automation (ICRA)*, 2023.

J10 R. Aldera, M. Gadd*, **D. De Martini*** and P. Newman. What Goes Around: Leveraging a Constant-curvature Motion Constraint in Radar Odometry. *IEEE Robotics and Automation Letters, IEEE*, 2022.

J9 T. Y. Tang, **D. De Martini**, S. Wu and P. Newman. Self-Supervised Learning for Using Overhead Imagery as Maps in Large-Scale Range Sensor Localisation. *International Journal of Robotics Research (IJRR)*, 2021.

J8 M. Broome, M. Gadd, **D. De Martini** and P. Newman. On the Road: Route Proposal from Radar Self-Supervised by Fuzzy LiDAR Traversability. *AI, MDPI*, 2020.

J7 **D. De Martini**, M. Gadd and P. Newman. kRadar++: Coarse-to-fine FMCW Scanning Radar Localisation. *Sensors, MDPI*, 2020.

J6 M. Musci, **D. De Martini**, N. Blago, T. Facchinetti and M. Piastra. Online Fall Detection using Recurrent Neural Networks on Smart Wearable Devices. *IEEE Trans. Emerging Topics in Computing*, 2020.

J5 **D. De Martini** and T. Facchinetti. Fault Detection of Electromechanical Actuators via Automatic Generation of Fuzzy Systems. *IEEE/ASME Trans. Mechatronics*, 2020.

J4 T. Y. Tang, **D. De Martini**, D. Barnes and P. Newman. RSL-Net: Localising in Satellite Images From a Radar on the Ground. *IEEE Robotics and Automation Letters, IEEE*, 2020.

J3 **D. De Martini**, G. Benetti, M. L. Della Vedova and T. Facchinetti. Adaptive Real-Time Scheduling of Cyber-Physical Energy Systems. *ACM Transactions on Cyber-Physical Systems, ACM*, 2017.

J2 **D. De Martini**, G. V. Gramazio, A. Bertini, C. E. Rottenbacher and T. Facchinetti. Design and Modeling of a Quadcopter with Double Axis Tilting Rotors. *Unmanned Systems, World Scientific*, 2017.

J1 M. A. Koledoye, **D. De Martini**, M. Carvani and T. Facchinetti. Design of a Mobile Robot for Air Ducts Exploration. *Robotics, MDPI*, 2017.

Peer-reviewed conference papers:

C45 J. Yuan, F. Pizzati, F. Pinto, L. Kunze, I. Laptev, P. Newman, P. Torr, **D. De Martini**. LikePhys: Evaluating Intuitive Physics Understanding in Video Diffusion Models via Likelihood Preference. *International Conference on Learning Representations (ICLR)*, 2026

C44 B. Ramtoula, PY. Lajoie, P. Newman and **D. De Martini**. Fantastic Features and Where to Find Them: A Probing Method to Combine Features from Multiple Foundation Models. *Conference on Neural Information Processing Systems (NeurIPS)*, 2025.

C43 D. Thuremella, Y. Yang, S. Wanna, L. Kunze and **D. De Martini**. Ensemble of Pre-Trained Models for Long-Tailed Trajectory Prediction. *IEEE Intelligent Transportation Systems Conference (ITSC)*, 2025.

C42 S. Sze, **D. De Martini** and L. Kunze. MinkOcc: Towards real-time label-efficient semantic occupancy prediction. *International Conference on Intelligent Robots and Systems (IROS)*, 2025.

C41 E. Panagiotaki, G. Pramatarov, L. Kunze and **D. De Martini**. GraphSCENE: On-Demand Critical Scenario Generation for Autonomous Vehicles in Simulation. *International Conference on Intelligent Robots and Systems (IROS)*, 2025. 🏆[9].

C40 G. Caroleo, A. Albini, **D. De Martini**, T. D. Barfoot and P. Maiolino. Tiny Lidars for Manipulator Self-Awareness: Sensor Characterization and Initial Localization Experiments. *International Conference on Intelligent Robots and Systems (IROS)*, 2025.

C39 V. Mușat, **D. De Martini***, M. Gadd* and P. Newman. NeuralFloors++: Consistent Street-Level Scene Generation From BEV Semantic Maps. *International Conference on Intelligent Robots and Systems (IROS)*, 2024. Also presented at the *UK AI Research Symposium*, 2025.

C38 E. Panagiotaki, T. Reinmund, S. Sze, B. Liu, S. Mouton, L. Pitt, A. S. Shanthini, M. Towlson, W. Tubby, C. Prahacs, **D. De Martini**, L. Kunze. RobotCycle: Assessing Cycling Safety in Urban Environments. Workshop on Socially Interactive Autonomous Mobility at the *IEEE Intelligent Vehicles Symposium*, 2024.

C37 D. Williams, M. Gadd, P. Newman and **D. De Martini**. Masked γ-SSL: Learning Uncertainty Estimation via Masked Image Modeling. *International Conference on Robotics and Automation (ICRA)*, 2024.

C36 G. Pramatarov, M. Gadd, P. Newman and **D. De Martini**. That's My Point: Compact Object-centric LiDAR Pose Estimation for Large-scale Outdoor Localisation. *International Conference on Robotics and Automation (ICRA)*, 2024.

C35 B. Ramtoula, **D. De Martini***, M. Gadd* and P. Newman. *VDNA-PR*: Using General Dataset Representations for Robust Sequential Visual Place Recognition. *International Conference on Robotics and Automation (ICRA)*, 2024.

C34 E. Panagiotaki, **D. De Martini**, and L. Kunze. Semantic Interpretation and Validation of Graph Attention-based Explanations for GNN Pose Estimation Models *International Conference on Advanced Robotics (ICAR)*, 2023.

C33 E. Panagiotaki, **D. De Martini**, G. Pramatarov, M. Gadd and L. Kunze. SEM-GAT: Lightweight, Introspective, Semantic Pose Estimation with Learned Graph Attention. *International Conference on Advanced Robotics (ICAR)*, 2023.

C32 L. Robinson, M. Gadd, P. Newman and **D. De Martini**. Robot-Relay: Building-wide, Calibration-less Visual Servoing with Learned Sensor Handover Networks. *International Symposium on Experimental Robotics (ISER)*, 2023.

[9] Finalist of the IEEE-RAS Outstanding Women in Robotics & Automation (WiRA) Paper Awards @ IROS25

C31 M. Gadd, B. Ramtoula, **D. De Martini** and P. Newman. What you see is what you get: Experience ranking with deep neural dataset-to-dataset similarity for topological localisation. *International Symposium on Experimental Robotics (ISER)*, 2023.

C30 F. Rennie, D. Williams, P. Newman and **D. De Martini**. Doppler-aware Odometry from FMCW Scanning Radar. *IEEE Intelligent Transportation Systems Conference (ITSC)*, 2023.

C29 L. Robinson, **D. De Martini**, M. Gadd and P. Newman. Visual Servoing on Wheels: Robust Robot Orientation Estimation in Remote Viewpoint Control. *International Conference on Intelligent Robots and Systems (IROS)*, 2023.

C28 T. Y. Tang, **D. De Martini** and P. Newman. Self-Supervised Lidar Place Recognition in Overhead Imagery Using Unpaired Data. *Robotics: Science and Systems (RSS)*, 2023.

C27 L. Campanaro, **D. De Martini**, S. Gangapurwala, W. Merkt and I. Havoutis. Roll-Drop: Accounting for Observation Noise with a Single Parameter. *Learning for Dynamics & Control Conference (L4DC)*, 2023.

C26 B. Ramtoula, M. Gadd, P. Newman and **D. De Martini**. Visual DNA: Representing and Comparing Images using Distributions of Neuron Activations. *Computer Vision and Pattern Recognition Conference (CVPR)*, 2023. Also presented at the *UK AI Research Symposium*, 2025, and at the *DataCV Workshop* at the *International Conference on Computer Vision (ICCV)*, 2025. 🏆[10]

C25 P. Kochakarn, **D. De Martini**, D. Omeiza, and L. Kunze. Explainable Action Prediction through Self-Supervision on Scene Graphs. *International Conference on Robotics and Automation (ICRA)*, 2023.

C24 G. Pramatarov, **D. De Martini***, M. Gadd* and P. Newman. BoxGraph: Semantic Place Recognition and Pose Estimation from 3D LiDAR. *International Conference on Intelligent Robots and Systems (IROS)*, 2022

C23 V. Mușat, **D. De Martini***, M. Gadd* and P. Newman. Depth-SIMS: Semi-Parametric Image and Depth Synthesis. *International Conference on Robotics and Automation (ICRA)*, 2022.

C22 R. Weston, M. Gadd, **D. De Martini** and P. Newman. Fast-MbyM: Leveraging Translational Invariance of the Fourier Transform for Efficient and Accurate Radar Odometry. *International Conference on Robotics and Automation (ICRA)*, 2022.

C21 M. Gadd, **D. De Martini**, and P. Newman. Contrastive Learning for Unsupervised Radar Place Recognition. *International Conference on Advanced Robotics (ICAR)*, 2021.

C20 L. Campanaro, S. Gangapurwala, **D. De Martini**, W. Merkt and I. Havoutis. Reinforcement Learning for Central Pattern Generators. *Towards Autonomous Robotic Systems Conference (TAROS)*, 2021.

C19 T. Y. Tang, **D. De Martini** and P. Newman. Get to the Point: Learning Lidar Place Recognition and Metric Localisation Using Overhead Imagery. *Robotics: Science and Systems (RSS)*, 2021.

C18 D. Williams, **D. De Martini**, M. Gadd, and P. Newman. Fool Me Once: Robust Selective Segmentation via Out-of-Distribution Detection with Contrastive Learning. *International Conference on Robotics and Automation (ICRA)*, 2021.

C17 C. Schroeder de Witt, C. Tong, V. Zantedeschi, **D. De Martini**, F. Kalaitzis, M. Chantry, P. Bilinski and D. Watson-Parris. RainBench: Towards Data-Driven Global Precipitation Forecasting from Satellite Imagery. *AAAI Conference on Artificial Intelligence*, 2021.

C16 T. Facchinetti, A. Bonandin, G. Benetti and **D. De Martini**. Distributed architecture for a smart LEDs display system based on MQTT. *IEEE International Conference on Emerging Technologies and Factory Automation (ETFA)*, 2020.

C15 T. Y. Tang, **D. De Martini**, S. Wu and P. Newman. Self-Supervised Localisation between Range Sensors and Overhead Imagery. *Robotics: Science and Systems (RSS)*, 2020.

C14 D. Williams, **D. De Martini**, M. Gadd, L. Marchegiani and P. Newman. Keep off the Grass: Permissible Driving Routes from Radar with Weak Audio Supervision. *IEEE Intelligent Transportation Systems Conference (ITSC)*, 2020.

C13 P. Kaul, **D. De Martini**, M. Gadd and P Newman. RSS-Net: weakly-supervised multi-class semantic segmentation with FMCW radar. *IEEE Intelligent Vehicles Symposium (IV)*, 2020.

C12 M. Gadd, **D. De Martini** and P. Newman. Look Around You: Sequence-based Radar Place Recognition with Learned Rotational Invariance. *IEEE/ION Position, Location and Navigation Symposium (PLANS)*, 2020.

C11 Ș. Săftescu, M. Gadd, **D. De Martini**, D. Barnes and P. Newman. Kidnapped Radar: Topological Radar Localisation using Rotationally-Invariant Metric Learning. *International Conference on Robotics and Automation (ICRA)*, 2020.

C10 T. Tse, **D. De Martini** and L. Marchegiani. No Need to Scream: Robust Sound-based Speaker Localisation in Challenging Scenarios *International Conference on Social Robotics*, 2019.

[10] Best Paper Award @ DataCV workshop @ ICCV 2025

C9 D. Giuffrida, G. Benetti, **D. De Martini** and T. Facchinetti. Fall Detection with Supervised Machine Learning using Wearable Sensors *International Conference on Industrial Informatics*, 2019.

C8 S. Kyberd, J. Attias, P. Murcutt, C. Prahacs, M. Towlson, S. Venn, A. Vasconcelos, M. Gadd, **D. De Martini** and P. Newman. The hulk: design and development of a weather-proof vehicle for long-term autonomy in outdoor environments. *International Conference on Field and Service Robotics*, 2019.

C7 R. Aldera, **D. De Martini***, M. Gadd* and P. Newman. What Could Go Wrong? Introspective Radar Odometry in Challenging Environments. *IEEE Intelligent Transportation Systems Conference (ITSC)*, 2019.

C6 R. Aldera, **D. De Martini***, M. Gadd* and P. Newman. Fast radar motion estimation with a learnt focus of attention using weak supervision. *IEEE International Conference on Robotics and Automation (ICRA)*, 2019.

C5 M. Koledoye, **D. De Martini**, S. Rigoni and T. Facchinetti. A Comparison of RSSI Filtering Techniques for Range-based Localization. *IEEE International Conference on Emerging Technologies and Factory Automation*, 2018.

C4 **D. De Martini**, G. Benetti and T. Facchinetti. Cyber/physical interplay in the real-time scheduling for peak load optimization of electric loads. *IEEE International Conference on Industrial Cyber-Physical Systems*, 2018.

C3 **D. De Martini**, A. Bonandin and T. Facchinetti. eduMorse: An Open-Source Framework for Mobile Robotics Education. *Robotics in Education: Latest Results and Developments*, 2017.

C2 **D. De Martini**, G. Benetti, F. Cipolla, D. Caprino, M. L. Della Vedova and T. Facchinetti. Peak load optimization through 2-dimensional packing and multi-processor real-time scheduling. *Proceedings of ACM International Conference on Computing Frontiers*, 2017. 🏆[11]

C1 **D. De Martini**, G. Roveda, A. Bertini, A. Marchini and T. Facchinetti. A Framework for Automatic Generation of Fuzzy Evaluation Systems for Embedded Applications. *International Joint Conference on Computational Intelligence*, 2017.

Peer-reviewed workshop papers:

W17 M. Bissessur, E. Panagiotaki, **D. De Martini**. Introspection in Learned Semantic Scene Graph Localisation. workshop on *Fully Autonomy Emerges from Cognition (FAST)* in the *International Conference on Intelligent Robots and Systems (IROS)*, 2025.

W16 D. Zhong, L. Robinson and **D. De Martini**. NeRFoot: Robot-Footprint Estimation for Image-Based Visual Servoing. ICRA40 anniversary, 2024.

W15 M. Gadd, **D. De Martini**, O. Bartlett, P. Murcutt, M. Towlson, M. Widojo, V. Musat, L. Robinson, E. Panagiotaki, G. Pramatarov, M. Alexander Kühn, L. Marchegiani, P. Newman and L. Kunze. OORD: The Oxford Offroad Radar Dataset. Workshop on Resilient Off-road Autonomy at the *International Conference on Robotics and Automation (ICRA)*, 2024.

W14 E. Panagiotaki, T. Reinmund, S. Sze, B. Liu, S. Mouton, L. Pitt, A. S. Shanthini, M. Towlson, W. Tubby, C. Prahacs, **D. De Martini**, L. Kunze. RobotCycle: Assessing Cycling Safety in Urban Environments. Workshop on Field Robotics at the *International Conference on Robotics and Automation (ICRA)*, 2024.

W13 M. Gadd, **D. De Martini**, L. Pitt, W. Tubby, M. Towlson, C. Prahacs, O. Bartlett, J. Jackson, M. Qi, P. Newman, A. Hector, R. Salguero-Gómez, N. Hawes. Watching Grass Grow: Long-term Visual Navigation and Mission Planning for Autonomous Biodiversity Monitoring. Workshop on Field Robotics at the *International Conference on Robotics and Automation (ICRA)*, 2024.

W12 Y. Diao, H. Dai, G. Zhao, and **D. De Martini**. TAGIC: Task-Guided Image Communication Framework for Seamless Teleoperation. Poster at *IEEE International Conference on Computer Communications (INFOCOM)*, 2024.

W11 E. Panagiotaki, **D. De Martini**, and L. Kunze. Towards Semantic Interpretation and Validation of Graph Attention-based Explanations. Explainable Robotics Workshop at the *International Conference on Robotics and Automation (ICRA)*, 2023.

W10 Z. Meng, C. She, G. Zhao, **D. De Martini**, and Y. Zhang. Sampling, Communication, and Prediction Co-Design for Synchronizing the Real-Robot and Digital-Robot in Metaverse. Late Breaking Results Poster at the *International Conference on Intelligent Robots and Systems (IROS)*, 2022

W9 Y. Diao, H. Dai, G. Zhao, and **D. De Martini**. Keyframe Selection, Communication, and Prediction for Teleoperated Driving Systems. Late Breaking Results Poster at the *International Conference on Intelligent Robots and Systems (IROS)*, 2022

W8 V. Růžička, A. Vaughan, **D. De Martini**, J. Fulton, V. Salvatelli, C. Bridges, G. Mateo-Garcia, and V. Zantedeschi. Smart satellites: machine learning on-board for low-latency novelty detection at the *AGU Fall Meeting*, 2021.

[11] Winner of the Best Short Paper award.

W7 V. Růžička, A. Vaughan, **D. De Martini**, J. Fulton, V. Salvatelli, C. Bridges, G. Mateo-Garcia, and V. Zantedeschi. Unsupervised Change Detection of Extreme Events Using ML On-Board. Workshop on Artificial Intelligence for Humanitarian Assistance and Disaster Response Workshop (AI+HADR) at the *Conference on Neural Information Processing Systems (NeurIPS)*, 2021.

W6 T. Suleymanov, M. Gadd, **D. De Martini**, and P. Newman. The Oxford Road Boundaries Dataset. Workshop on 3D-Deep Learning for Automated Driving at the *IEEE Intelligent Vehicles Symposium (IV)*, 2021.

W5 M. Gadd*, **D. De Martini*** and P. Newman. Unsupervised Place Recognition with Deep Embedding Learning over Radar Videos. All-Weather Autonomy Workshop at the *IEEE International Conference on Robotics and Automation (ICRA)*, 2021.

W4 C. Tong, C. Schroeder de Witt, V. Zantedeschi, **D. De Martini**, F. Kalaitzis, M. Chantry, P. Bilinski and D. Watson-Parris. RainBench: Enabling Data-Driven Precipitation Forecasting on a Global Scale. Tackling Climate Change with Machine Learning and AI for Earth Sciences workshops at the *Conference on Neural Information Processing Systems (NeurIPS)*, 2020.

W3 V. Zantedeschi, **D. De Martini**, C. Tong, C. Schroeder de Witt, F. Kalaitzis, P. Biliński, M. Chantry and D. Watson-Parris. Towards Data-Driven Physics-Informed Global Precipitation Forecasting from Satellite Imagery. Tackling Climate Change with Machine Learning and AI for Earth Sciences workshops at the *Conference on Neural Information Processing Systems (NeurIPS)*, 2020.

W2 M. Gadd*, **D. De Martini***, L. Marchegiani, P. Newman and L. Kunze. Sense-Assess-eXplain (SAX): building trust in autonomous vehicles in challenging real-world driving scenarios. Workshop on Ensuring and Validating Safety for Automated Vehicles (EVSAV) at the *IEEE Intelligent Vehicles Symposium (IV)*, 2020.

W1 D. Williams, **D. De Martini**, L. Marchegiani and P. Newman. Listening closely to see far away: Radar-based Terrain Classification from Auditory Signals. Abstract submission at the *International Conference on Digital Image & Signal Processing*, 2019.

Books:

B1 C. Cusano, T. Facchinetti, C. Larizza, E. Losiouk, A. Tramonte and **D. De Martini**. Programmazione In Linguaggio C. Problemi e Temi Svolti. (eng: Exercises in the C Programming Language) *Medea Editore*, 2015.

Online:

O1 E. Panagiotaki, **D. De Martini**, L. Kunze, P. Veličković. NAR-* ICP: Neural Execution of Classical ICP-based Pointcloud Registration Algorithms. Arxiv: https://arxiv.org/pdf/2410.11031

O3 S. Shen, G. Pramatarov, Y. Tao, **D. De Martini**. Neural-MMGS: Multi-modal Neural Gaussian Splats for Large-Scale Scene Reconstruction. Arxiv: https://arxiv.org/pdf/2509.17762