







# Daniele De Martini, PhD, MIEEE

Postdoctoral Research Assistant @ Oxford Robotics Institute

 [daniele@robots.ox.ac.uk](mailto:daniele@robots.ox.ac.uk) ·  (+39) 338 8941500 ·  [bit.ly/2Q4clhK](https://bit.ly/2Q4clhK)  
 [bit.ly/2J2lyf3](https://bit.ly/2J2lyf3) ·  [danieledema](https://github.com/danieledema) ·  [bit.ly/3216Zim](https://bit.ly/3216Zim)

## Research Interests

---

**Main Areas** Robotics, perception and state estimation, machine learning and deep learning, weather-proof operations, navigation, cyber-physical systems

**Applications** autonomous vehicles, agriculture robotics, service robotics

## Job Positions

---

University of Oxford - Kellogg College  
Junior Research Fellow

Oxford, UK  
10/2019 – Ongoing

University of Oxford - Oxford Robotics Institute  
PostDoctoral Research Assistant

Oxford, UK  
05/2018 – Ongoing

Develop of algorithm for robust odometry and localisation using uncommon sensors for autonomy, especially radar · Develop of Machine Learning techniques for environment understanding with radar systems

Frontier Development Lab  
Researcher in the Digital Twin Earth Team

Virtual  
06/2020 – 08/2020

Development of algorithms for precipitation forecasts through Machine Learning techniques · Collaboration with Oxford University and ESA

FCA  
Engineer specialist in the R&D chassis group

Torino, Italy  
04/2014 – 01/2015

Multibody design and analysis of front and rear suspensions · Constrained optimization of suspension springs

## Education

---

Università degli Studi di Pavia  
Ph.D. student

Pavia, Italy  
02/2015 – 01/2018

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

Politecnico di Torino  
M.Sc. in Mechatronics Engineering

Torino, Italy  
09/2011 – 12/2013

Thesis: *Design of a VTOL UAV*, under the supervision of Prof. Giancarlo Genta, in collaboration with the company *Mediamotive* – final mark: 110/110

Università degli Studi di Pavia  
B.Sc. in Mechanical Engineering

Pavia, Italy  
09/2008 – 09/2011

Thesis: *200 m K1 kayak race simulation: cinematic and dynamic analysis and physiological aspects*, under the supervision of Prof. Carlo Rottenbacher – final mark: 110/110

## Grants, Funding and Awards

---

Sense-Assess-eXplain  
Researcher Co-Investigator in the project Sense-Assess-eXplain

2019 – 2021  
314k £

Visiting Student  
to visit University of New Brunswick (Fredericton, Canada) during my PhD at University of Pavia

2016 – 2017  
3k €

Best Short Paper Award  
for the paper *Peak load optimization through 2-dimensional packing and multi-processor real-time scheduling*

2017

PhD Italian Scholarship  
to attend the PhD school of Engineering at University of Pavia, Pavia, Italy

2015 – 2018  
36k €

## Visiting Periods

---

University of New Brunswick  
Visiting Ph.D. student

Fredericton, Canada  
10/2016 – 03/2017

Implementation of a multirobot distributed coordination algorithm and test in HIL simulations (ROS on ODROID XU4 platform) · Gaining expertise on PixHawk flight controller on both ground and quadcopter platforms · Helping during field tests with quadcopters and fixed wing aircrafts, getting expertise on practical aspects like LiPo battery management

## Teaching Experience

---

### University of Oxford

- Co-supervision of 4YP, CDT and PhD students
- B16 – software engineering laboratory demonstrations
- B16 – software engineering small-groups tutorials
- Robotics Laboratory demonstrations
- P5 – computing laboratory demonstrations
- PAT (Physics Aptitude Test) marker

2018 – Ongoing

2018 – Ongoing

2018 – Ongoing

2018 – Ongoing

2018 – Ongoing

2018 – Ongoing

2018 – Ongoing

### Università degli Studi di Pavia

- Co-supervision of B.Sc. and M.Sc. students thesis
- Supervision of the practical projects of the *Robotics* course held by Prof. Tullio Facchinetti
- Tutorship of C programming bases

2015 – 2017

## Research Projects

---

**Researcher co-investigator** for Oxford Robotics Institute: *Sense-Assess-Explain (SAX): Building Trust in Autonomous Vehicles in Challenging Real-World Driving Scenarios* 2019 – 2021

## Industrial Projects

---

- Implementation of a fuzzy logic based infrastructure for risk index assessment Alisea S.r.l., 2018
- Design of a mechanical system for stress tests on athletic surface materials Mondo S.p.A., 2018
- Design of a mobile robot for air duct exploration Alisea S.r.l., 2015

## Patents and Intellectual Properties

---

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

## Organisation of Scientific Meetings and Commission of Trust

---

**Chair:** *International Conference on Intelligent Transportation Systems (ITSC)* (2019)

**Organising committee:** Special session on *Beyond Traditional Sensing for Intelligent Transportation @ International Conference on Intelligent Transportation Systems (ITSC)* (2019 – 2021)

**Associate editor** *International Conference on Robotics and Automation (ICRA)* (2021) · *International Conference on Intelligent Transportation Systems (ITSC)* (2019 – 2021)

**Reviewer Board Member:** *MDPI Sensors* (from 2020) · *MDPI Actuators* (from 2020)

**Program committee:** *International Conference on Emerging Technologies and Factory Automation (ETFA)* (2019 – 2021) · *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)* (2021) · *Autonomous Robots (Auro)* (2021) · *IEEE Transactions on Mechatronics* (2020) · *Nature Machine Intelligence* (2020) · *MDPI Actuators* (2020) · *Manning Publications* (2019 – 2020) · *International Symposium on Experimental Robotics (ISER)* (2020) · *International Conference on Intelligent Robots and Systems (IROS)* (2018 – 2020) · *International Conference on Intelligent Transportation Systems (ITSC)* (2019 – 2020) · *International Conference on Industrial Cyber-Physical Systems (ICPS)* (2020) · *Intelligent Vehicles Symposium (IV)* (2020) · *International Conference on Industrial Electronics for Sustainable Energy Systems (IESES)* (2020) · *International Conference on Cyber-Physical Systems (ICCPs)* (2018) · *World Scientific* (2017)

## Invited Talks

---

- [1] *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)
- [2] *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)

## Publication List

---

**Peer-reviewed journal articles:**

- [1] 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.

- [2] **D. De Martini**, M. Gadd and P. Newman. kRadar++: Coarse-to-fine FMCW Scanning Radar Localisation *Sensors, MDPI*, 2020.
- [3] 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.
- [4] **D. De Martini** and T. Facchinetti. Fault Detection of Electromechanical Actuators via Automatic Generation of Fuzzy Systems. *IEEE/ASME Trans. Mechatronics*, 2020.
- [5] 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.
- [6] **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.
- [7] **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.
- [8] 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:

- [1] D. Williams, **D. De Martini**, M. Gadd., L. Marchegiani and P. Newman. Fool Me Once: Robust Selective Segmentation via Out-of-Distribution Detection with Contrastive Learning. *International Conference on Robotics and Automation*, 2021. [Accepted]
- [2] 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
- [3] 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.
- [4] T. Y. Tang, **Daniele De Martini**, S. Wu and P. Newman. Self-Supervised Localisation between Range Sensors and Overhead Imagery. *Robotics: Science and Systems (RSS)*, 2020.
- [5] 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.
- [6] 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.
- [7] 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.
- [8] Ş. 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*, 2020.
- [9] 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] 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.
- [11] S. Kyberd, J. Attias, P. Murcutt, C. Prahacs, M. Towilson, S. Venn, A. Vasconcelos, M. Gadd, **D. De Martini** and P. Newman. What Could Go Wrong? Introspective Radar Odometry in Challenging Environments. *IEEE Intelligent Transportation Systems Conference*, 2019.
- [12] 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*, 2019.
- [13] 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.
- [14] **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.
- [15] **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.
- [16] **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.  
Winner of the *Best short paper* award.
- [17] **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:

- [1] 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.
- [2] 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.
- [3] 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. *IEEE Intelligent Vehicles Symposium (IV)*, 2020.
- [4] 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:

- [1] 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.