

Markus Wulfmeier

GENERAL INFORMATION	Research Scientist Machine Learning & Robotics Research Focus: Transfer Learning, Modularity & Decomposition, Learning from Demonstration, Autonomous Mobility	<i>Mail:</i> m.wulfmeier@gmail.com
RESEARCH APPOINTMENTS	Research Scientist , Google DeepMind, London, UK 2018 - <ul style="list-style-type: none">• Focus: Robotics and Machine Learning Postdoctoral Research Scientist , Oxford Robotics Institute, University of Oxford, UK 2018 <ul style="list-style-type: none">• Focus: Efficient Machine Learning to Enable Straightforward Integration of Robots into New Tasks and Environments• Advisors: Prof. Ingmar Posner Postgraduate Research Assistant , Real-Time Systems Group, Leibniz University of Hannover (LUH), Germany 2013-14 <ul style="list-style-type: none">• Development of Successful ERC Horizon2020 Collaborative Research Grant Proposal (Smoke-Bot) for Robotic Applications in First Responder Scenarios with Limited Vision• Research on Path Planning and Learning from Demonstration for Humanoid Robots• Supervision of Graduate Student Research Projects• Advisors: Prof. Bernardo Wagner	
ACADEMIC EDUCATION	DPhil (Doctorate), Oxford Robotics Institute, University of Oxford, UK 2014-18 <ul style="list-style-type: none">• Thesis: Efficient Supervision for Robotics via Imitation, Simulation and Adaptation• Shell Eco Marathon 2016: Software-Lead Autonomous Motion Planning Modules• Advisors: Prof. Ingmar Posner; Prof. Paul Newman Visiting Researcher , Berkeley Artificial Intelligence Research, UC Berkeley, CA, USA 2017 <ul style="list-style-type: none">• Research Topic: <i>Simulation to Robot Transfer Learning, Reinforcement Learning, Curriculum Learning</i>• Advisors: Prof. Pieter Abbeel (UCB/OpenAI) M.Sc. , Mechatronics Engineering, Leibniz University of Hannover, Germany 2012-13 <ul style="list-style-type: none">• Focus: Robotics and Control Theory• Final Grade 1.3 Visiting Researcher , Agile and Dexterous Robotics Lab, Swiss Federal Institute of Technology (ETH), Switzerland 2013 <ul style="list-style-type: none">• Research Topic: <i>Development of GPU-Based Rigid Body Dynamics for Motion Planning and Control of Robots</i>• Advisors: Prof. Jonas Buchli (ETH); Dr. Thorsten Lilge (LUH) B.Sc. , Mechatronics Engineering, Leibniz University of Hannover, Germany 2008-12 <ul style="list-style-type: none">• Final Grade 1.8 ('Best Mechatronics Student of the Academical Year 2012') Visiting Researcher Massachusetts Institute of Technology (MIT), MA, USA 2011-12 <ul style="list-style-type: none">• Research Topic: <i>Development of a Particle Image Velocimetry Method for Analysis of Mars-Rover Wheel-Terrain Interaction Phenomena</i>• Advisors: Prof. Karl Iagnemma (MIT); Prof. Dr. Berend Denkena (LUH)	
AWARDS AND SCHOLARSHIPS	Paper Awards <ul style="list-style-type: none">• International Conference on Intelligent Robots and Systems - Best Student Paper Award 2016• Ground Vehicle Systems Engineering and Technology Symposium - Best Conference Paper Award 2012	

Fellow- & Scholarships

- Dr. Jost Henkel Foundation 2015-17
- Dr. Hans Lenze Foundation 2014-16
- UK Engineering and Physical Sciences Research Council Doctoral Training Award 2014-2017
- Ulderup Foundation 2013
- Kurt-Alten Stiftung Foundation 2012
- Freundeskreis der Leibniz Universitaet Hannover 2012-2013

Other Awards

- International Conference on Intelligent Robots and Systems - Travel Award 2016, 2017
- Neural Information Processing Systems Conference - Travel Award 2017
- University of Oxford Department of Engineering Science - Travel Award 2016
- New College Oxford - Travel Award 2014-2017
- LUH Field of Mechatronics - Certificate as 'Best Student of the Academical Year 2012'

CONFERENCES, WORKSHOPS & FORUMS

Organisation

- Robotics Science & Systems 2018 - Workshop on New Benchmarks, Metrics, and Competitions for Robotic Learning
- Neural Information Processing Systems 2017 - Workshop on Acting and Interacting in the Real World: Challenges in Robot Learning
- New College Oxford Fervour Forum on Artificial Intelligence 2016
- Talks and Workshops for the Oxford AI Society 2016-17

Program Committee and Review

- Review for Various Robotics, Computer Vision, and Machine Learning Conferences and Journals
- PC for Neural Information Processing Systems 2017 - Deep Reinforcement Learning Symposium - Workshop on Challenges in Robot Learning

ADVISING

Undergraduate Level

- 2017 Sasha Salter, Edward Wagstaff, Walter Goodwin

Graduate Level

- 2018 Sasha Salter

INVITED TALKS

'Reusable Robot Learning'

- July 2018: Merantix, TU Berlin, Heidelberg AI Seminar

'Efficient Supervision for Robot Learning via Imitation, Adaptation, and Simulation.'

- February 2018: DeepMind, AIMS Center for Doctoral Training (Oxford University)
- April 2018: Ascent Robotics

'Efficient Supervision for Robot Learning - Why Robots are Even Harder to Supervise than PhD Students' (General Audience)

- March 2018: London Machine Learning Meetup

'Effortless Supervision - How to Increase the Efficiency of Optimising Behaviours.'

- June 2017: Stanford, Uber, Facebook AI Research
- July 2017: Google Brain, Zoox, Volkswagen ERL

SELECTED
PUBLICATIONS

- [1] Shiarli, K.; Wulfmeier, M.; Salter, S.; Whiteson, S.; and Posner, I., “TACO: Learning Task Decomposition via Temporal Alignment for Control”, *In Proceedings of the 2018 International Conference on Machine Learning*, 2018
- [2] Wulfmeier, M.; Bewley, A.; and Posner, I., “Incremental Adversarial Domain Adaptation”, *In Proceedings of the 2018 IEEE International Conference on Robots and Automation*, 2018
- [3] Wulfmeier, M.; and Posner, I.; and Abbeel P., “Mutual Alignment Transfer Learning”, *In Proceedings of the 2017 Conference on Robot Learning*, Oral Presentation, 2017
- [4] Florensa, C.; Held, D.; Wulfmeier, M. and Abbeel P., “Reverse Curriculum Generation for Reinforcement Learning”, *In Proceedings of the 2017 Conference on Robot Learning*, 2017
- [5] Wulfmeier, M.; Bewley, A.; and Posner, I., “Addressing Appearance Change in Outdoor Robotics with Adversarial Domain Adaptation”, *In Proceedings of the 2016 IEEE/RSJ International Conference on Intelligent Robots and Systems*, 2017
- [6] Wulfmeier, M.; Wang, D.Z.; and Posner, I., “Watch This: Scalable Cost-Function Learning for Path Planning in Urban Environments”, *In Proceedings of the 2016 IEEE/RSJ International Conference on Intelligent Robots and Systems*, Best Student Paper Award, 2016
- [7] Wulfmeier, M.; Rao, D.; and Posner, I., “Incorporating Human Domain Knowledge into Large Scale Cost Function Learning”, *CoRR; NIPS Deep Reinforcement Learning Workshop 2016*, abs/1612.04318, 2016
- [8] Wulfmeier, M.; Ondruska, P.; and Posner, I., “Maximum Entropy Deep Inverse Reinforcement Learning”, *CoRR; NIPS Deep Reinforcement Learning Workshop 2015*, abs/1507.04888, 2015
- [9] Wang, Q.; Wulfmeier, M.; and Wagner, B., “Voronoi-based Heuristic for Nonholomic Search-based Path Planning”, *13th International Conference on Intelligent Autonomous Systems*, 2014
- [10] Senatore, C.; Wulfmeier, M.; Vlahinic, I.; Andrade, J.; and Iagnemma, K., “Design and Implementation of a Particle Image Velocimetry Method for Analysis of Running Gear-Soil Interaction”, *Journal of Terramechanics*, 2013
- [11] Senatore, C.; Wulfmeier, M.; Jayakumar, P.; MacLennan, J.; and Iagnemma, K., “Investigation of Stress and Failure in Granular Soils For Lightweight Robotic Vehicle Applications”, *Proceedings of the Ground Vehicle Systems Engineering and Technology Symposium, 2012*, Best Conference Paper Award

PRE-GRAD.
PROFESSIONAL
EXPERIENCE

- Student Research Assistant, Leibniz University of Hannover**, Germany **2010-12**
- Institute of Automatic Control: *Kalman Filter Based Sensor Data Fusion for Robotic Joint Angle Determination*
 - Institute for Biomechanics *Multi-Body Simulations Based on 3D Tracking Data for Muscle Stress Determination*
 - Institute for Measurement (Inverse) *Structured-Light 3D Scanning*
 - Institute for Microelectronic Systems *Chip Placement Optimisation (Electronic Design Automation)*
- Internship, Continental AG** **2011**
- Segment Electronic Air Suspension Systems, Hannover, Germany
- *Rapid Prototyping System for Control System for Control of Electronic Air Suspension*

SOCIAL
ENGAGEMENT

- New College, Oxford** **2014 to 2017**
- Involvement in Sport-Based and Social Activities of the College
 - Organisation of Interest-Based Student Forums

Christian Youth Work**2001 to 2012**

- Main activities:
 - Leadership and Support of Youth Groups and Camps throughout Europe
 - Planning and Coordinating of Events and Vacations
- Training in Leadership, Organisation, Conflict Management (with Focus on Youth Groups)

Science Competitions**2005 to 2007**

- '*OWL Schuelerwettbewerb*', Three Times First Place at Technology-Based Regional Contest
- '*Jugend Forscht*', Regional Contest - First Place, State Contest - Special Award For Ecology