Marco Ewerton

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Current Position

Since Jan. 2015

Ph.D. Student at IAS TU Darmstadt.

I am a Ph.D. Student at the Intelligent Autonomous Systems group of the TU Darmstadt. The topic of my research project is "Bidirectional Human-Robot Learning: Imitation and Skill Improvement". I investigate how humans and robots can improve their movements by interacting with each other.
Supervisors: Prof. Dr. Jan Peters and Ph.D. Guilherme Maeda.

Research Interests

Artificial Intelligence, Machine Learning, Robotics, Imitation Learning, Human-Robot Interaction, Motor Skill Learning

Education Background

Oct. 2012– Dec. 2014	M.Sc. in Electrical Engineering and Information Technology (Elektrotechnik und Informationstechnik), option Technical Computer Science (Datentechnik). Technische Universität Darmstadt, Germany. Thesis: "Modeling Human-Robot Interaction with Probabilistic Movement Representations". Supervisors: Prof. Dr. Jan Peters, Prof. Dr.-Ing. Klaus Hofmann, Jun. Prof. Dr. techn. Gerhard Neumann and Ph.D. Guilherme Maeda.
Oct. 2009– Sep. 2012	B.Sc. in Electrical Engineering and Information Technology (Elektrotechnik und Informationstechnik), option Technical Computer Science (Datentechnik). Technische Universität Darmstadt, Germany. Thesis: "Job Characteristics on Crowdsourcing Platforms". Supervisors: Prof. Dr.-Ing. Ralf Steinmetz, Dr.-Ing. Philipp Scholl and M.Sc. Sebastian Schmidt.
Apr. 2009– Sep. 2009	Exchange Student of Electrical Engineering and Information Technology (Elektrotechnik und Informationstechnik), option Technical Computer Science (Datentechnik) at the TU Darmstadt.
Apr. 2008– Mar. 2009	Exchange Student of Computer Science at the TU Darmstadt.
Mar. 2005– Dec. 2007	Bachelor Student of Computer Engineering at the University of São Paulo (USP), Brazil.

Previous Work Experience

Apr. 2012– Dec. 2013	**Work at IAS TU Darmstadt.** I worked as a research assistant at the Intelligent Autonomous Systems group at the TU Darmstadt. There my main topics were "3D Reconstruction from multiple Kinect cameras" and "Human-Robot Interaction".
June 2009– Mar. 2011	**Work at Fraunhofer IGD.** I worked as a research assistant at the department "Information Visualization and Visual Analytics" at the Fraunhofer IGD in Darmstadt. As part of my activities, I wrote ontologies, programmed in ActionScript and JAVA and executed a number of tasks involving Semantics and Semantics Visualization.
Oct. 2006– Aug. 2007	**Work at interlab USP.** I worked as a volunteer at the laboratory for interactive technologies (interlab) of the University of São Paulo (USP), Brazil. There I worked on the development of a soccer game for two robots using JAVA (https://www.youtube.com/watch?v=MrXsK54NjIc&feature=related).

Teaching Assistance

Winter Semester 2017/2018	Robot Learning. TU Darmstadt.
Summer Semester 2017	Statistical Machine Learning. TU Darmstadt.
Winter Semester 2016/2017	Robot Learning Integrated Project. TU Darmstadt.

Supervision of Students

2018	Zlatko Kolev. *Joint Learning of Humans and Robots*. Bachelor Thesis.
2017–2018	Michael Burkhardt, Moritz Knaust and Susanne Trick. *From Robots to Cobots*. Robot Learning Integrated Project.
2017	Claudia Lölkes. *Incremental Imitation Learning with Estimation of Uncertainty*. Bachelor Thesis.
2016–2017	David Rother, Jakob Weimar and Lars Lotter. *Teaching People how to Write Japanese Characters*. Robot Learning Integrated Project.
2015–2016	Florian Brandherm. *Learning Minigolf with the BioRob*. Robot Learning Integrated Project.

Journal Papers

2018	**M. Ewerton**, D. Rother, J. Weimar, G. Kollegger, J. Wiemeyer, J. Peters, and G. Maeda. Assisting movement training and execution with visual and haptic feedback. *Frontiers in neurorobotics*, 2018
2017	G. Maeda, G. Neumann, **M. Ewerton**, R. Lioutikov, O. Kroemer, and J. Peters. Probabilistic movement primitives for coordination of multiple human-robot collaborative tasks. *Autonomous Robots (AURO)*, 41(3):593–612, 2017
2017	G. Maeda, **M. Ewerton**, G. Neumann, R. Lioutikov, and J. Peters. Phase estimation for fast action recognition and trajectory generation in human-robot collaboration. *International Journal of Robotics Research (IJRR)*, 36(13-14):1579–1594, 2017
2017	O. Dermy, A. Paraschos, **M. Ewerton**, F. Charpillet, J. Peters, and S Ivaldi. Prediction of intention during interaction with icub with probabilistic movement primitives. *Frontiers in Robotics and AI*, 4:45, 2017
2017	G. Kollegger, **M. Ewerton**, J. Wiemeyer, and J. Peters. Bimrob - bidirectional interaction between human and robot for the learning of movements. *Proceedings of the 11th International Symposium on Computer Science in Sport (IACSS 2017)*, pages 151–163, 2017
2016	G. Maeda, **M. Ewerton**, D Koert, and J. Peters. Acquiring and generalizing the embodiment mapping from human observations to robot skills. *IEEE Robotics and Automation Letters (RA-L)*, 1(2):784–791, 2016

Conference Papers

2018 D. Koert, S. Trick, **M. Ewerton**, M. Lutter, and J. Peters. Online learning of an open-ended skill library for collaborative tasks. In *Proceedings of the International Conference on Humanoid Robots (HUMANOIDS)*, 2018

2018 G. Kollegger, F. Götz, **M. Ewerton**, J. Wiemeyer, and J. Peters. Einfluss der beobachtungsperspektive beim bewegungslernen von mensch-roboter-dyaden. In *12. Symposium der dvs-Sektion Sportinformatik und Sporttechnologie*, pages 51–52, 2018

2017 **M. Ewerton**, G. Kollegger, G. Maeda, J. Wiemeyer, and J. Peters. Iterative Feedback-basierte Korrekturstrategien beim Bewegungslernen von Mensch-Roboter-Dyaden. In *DVS Sportmotorik 2017*, 2017

2017 G. Kollegger, N. Reinhardt, **M. Ewerton**, J. Peters, and J. Wiemeyer. Die Bedeutung der Beobachtungsperspektive beim Bewegungslernen von Mensch-Roboter-Dyaden. In *DVS Sportmotorik 2017*, 2017

2017 J. Wiemeyer, J. Peters, G. Kollegger, and **M. Ewerton**. BIMROB - Bidirektionale Interaktion von Mensch und Roboter beim Bewegungslernen. In *DVS Sportmotorik 2017*, 2017

2017 G. Kollegger, **M. Ewerton**, J. Wiemeyer, and J. Peters. Bimrob - bidirectional interaction between human and robot for the learning of movements - robot trains human - human trains robot. In *23. Sportwissenschaftlicher Hochschultag der dvs*, 2017

2017 G. Maeda, **M. Ewerton**, T. Osa, B. Busch, and J. Peters. Active incremental learning of robot movement primitives. In *Proceedings of the Conference on Robot Learning (CoRL)*, 2017

2017 G. Kollegger, J. Wiemeyer, **M. Ewerton**, and J. Peters. Bimrob - bidirectional interaction between human and robot for the learning of movements - robot trains human - human trains robot. In *Inovation & Technologie im Sport - 23. Sportwissenschaftlicher Hochschultag der deutschen Vereinigung für Sportwissenschaft*, page 179. Czwalina-Feldhaus, 2017

2016 **M. Ewerton**, G. Maeda, G. Neumann, V. Kisner, G. Kollegger, J. Wiemeyer, and J. Peters. Movement primitives with multiple phase parameters. In *Proceedings of the International Conference on Robotics and Automation (ICRA)*, pages 201–206, 2016

2016 G. Maeda, A. Maloo, **M. Ewerton**, R. Lioutikov, and J. Peters. Anticipative interaction primitives for human-robot collaboration. In *AAAI Fall Symposium Series. Shared Autonomy in Research and Practice, Arlington, VA, USA*, 2016

2016 **M. Ewerton**, G. Maeda, G. Kollegger, J. Wiemeyer, and J. Peters. Incremental imitation learning of context-dependent motor skills. In *Proceedings of the International Conference on Humanoid Robots (HUMANOIDS)*, pages 351–358, 2016

2016 G. Kollegger, **M. Ewerton**, J. Peters, and J. Wiemeyer. Bidirektionale Interaktion zwischen Mensch und Roboter beim Bewegungslernen (BIMROB). In *11. Symposium der DVS Sportinformatik*, 2016

2015 **M. Ewerton**, G. Neumann, R. Lioutikov, H. Ben Amor, J. Peters, and G. Maeda. Learning multiple collaborative tasks with a mixture of interaction primitives. In *Proceedings of the International Conference on Robotics and Automation (ICRA)*, pages 1535–1542, 2015

2015 **M. Ewerton**, G. Maeda, J. Peters, and G. Neumann. Learning motor skills from partially observed movements executed at different speeds. In *Proceedings of the IEEE/RSJ Conference on Intelligent Robots and Systems (IROS)*, pages 456–463, 2015

2015 G. Maeda, G. Neumann, **M. Ewerton**, R. Lioutikov, and J. Peters. A probabilistic framework for semi-autonomous robots based on interaction primitives with phase estimation. In *Proceedings of the International Symposium of Robotics Research (ISRR)*, 2015

2014 G. Maeda, **M. Ewerton**, R. Lioutikov, H.B. Amor, J. Peters, and G. Neumann. Learning interaction for collaborative tasks with probabilistic movement primitives. In *Proceedings of the International Conference on Humanoid Robots (HUMANOIDS)*, pages 527–534, 2014

2013 H. Ben Amor, D. Vogt, **M. Ewerton**, E. Berger, B. Jung, and J. Peters. Learning responsive robot behavior by imitation. In *Proceedings of the 2013 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pages 3257–3264, 2013

2012 O. Kroemer, H. Ben Amor, **M. Ewerton**, and J. Peters. Point cloud completion using extrusions. In *Proceedings of the International Conference on Humanoid Robots (HUMANOIDS)*, 2012

Workshop Papers

2017 **M. Ewerton**, G. Maeda, D. Rother, J. Weimar, L. Lotter, G. Kollegger, J. Wiemeyer, and J. Peters. Assisting the practice of motor skills by humans with a probability distribution over trajectories. In *Workshop Human-in-the-loop robotic manipulation: on the influence of the human role at IROS 2017, Vancouver, Canada*, 2017

2016 G. Maeda, A. Maloo, **M. Ewerton**, R. Lioutikov, and J. Peters. Proactive human-robot collaboration with interaction primitives. In *International Workshop on Human-Friendly Robotics (HFR), Genoa, Italy*, 2016

2015 **M. Ewerton**, G. Neumann, R. Lioutikov, H. Ben Amor, J. Peters, and G. Maeda. Modeling spatio-temporal variability in human-robot interaction with probabilistic movement primitives. In *Workshop on Machine Learning for Social Robotics, ICRA*, 2015

Theses

2014 **M. Ewerton**. Modeling human-robot interaction with probabilistic movement representations. Master's thesis, TU Darmstadt, 2014

Honors and Awards

2015 **Best Conference Paper Award - Finalist**
for the paper "Learning multiple collaborative tasks with a mixture of interaction primitives" jointly with Gerhard Neumann, Rudolf Lioutikov, Heni Ben Amor, Jan Peters, Guilherme Jorge Maeda

2015 **Best Student Conference Paper Award - Finalist**
for the paper "Learning multiple collaborative tasks with a mixture of interaction primitives" jointly with Gerhard Neumann, Rudolf Lioutikov, Heni Ben Amor, Jan Peters, Guilherme Jorge Maeda

2015 **Service Robotics Best Paper Award - Finalist**
for the paper "Learning multiple collaborative tasks with a mixture of interaction primitives" jointly with Gerhard Neumann, Rudolf Lioutikov, Heni Ben Amor, Jan Peters, Guilherme Jorge Maeda

Reviews

2019 Autonomous Robots (AURO)

2019 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)

2019 IEEE Transactions on Robotics (T-RO)

2019 IEEE Transactions on Cybernetics

2019 IEEE International Conference on Robotics and Automation (ICRA)

2018 Workshop on Reinforcement Learning under Partial Observability, NIPS

2018 IEEE Robotics and Automation Letters (RA-L)

2018 Conference on Robot Learning (CoRL)

2018 Journal of Intelligent & Robotic Systems

2018 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)

2018 International Journal of Robotics Research (IJRR)

2018 Autonomous Robots (AURO)

2018 IEEE International Conference on Robotics and Automation (ICRA)

2017 IEEE International Conference on Multisensor Fusion and Integration for Intelligent Systems (MFI)

2017 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)

2017 Autonomous Robots (AURO)

2016 IEEE/RAS International Conference on Humanoid Robots (HUMANOIDS)

2016 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)

2015 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)

2015 IEEE Robotics and Automation Magazine (RAM)

2015 IEEE Transactions on Robotics (T-RO)

2014 IEEE Transactions on Robotics (T-RO)

Invited Talks

Feb. 07, 2019	University of Tokyo, Tokyo, Host: Takayuki Osa
Feb. 04, 2019	Advanced Telecommunications Research Institute International (ATR), Kyoto, Host: Guilherme Maeda
Jan. 29, 2019	Honda Research Institute Japan Co-Research Lab, Tokyo, Host: Chris Garry
Jan. 22, 2019	Keio University, Yokohama, Host: Masaki Takahashi
Nov. 07, 2017	Symposium "Kollaborative Robotik". Organizers: IHK Hessen innovativ, VDI Bezirksverein Mittelhessen e.V. and VDE Rhein-Main. Location: Geschäftsstelle Gießen Industrie- und Handelskammer Gießen-Friedberg

Research Stays

Jan. 2019– Mar. 2019	Keio University, School of Science and Engineering, Department of System Design Engineering, Takahashi Laboratory, Yokohama, Japan

Summer School Attendance

2015	Machine Learning Summer School at the Max Planck Institute for Intelligent Systems, Tübingen, Germany

Languages

Portuguese	Mother tongue
English	Fluent
German	Fluent (Goethe-Certificate-C1, TestDaf, DSH 2)