

Short CV

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Position Professor of Robotics, Head of Institute

Career

since 09/16 Full Professor, Technische Universität Braunschweig
02/15 – 05/19 Coordinator H2020 CogIMon: Cognitive Compliant Interaction in Motion
since 03/15 Visiting Professor in Computer Science, Brookes University, Oxford, UK
04/07 - 09/16 Managing Director Research Institute for Cognition & Robotics – CoR-Lab, Bielefeld
09/13 - 12/13 temporary Full Professor of Computer Science, Brookes University, Oxford UK
03/10 - 02/14 Coordinator FP7-IP AMARSi: Adaptive Modular Architectures for Rich Motor Skills
05/08 - 09/16 Professor of Neuroinformatics at Faculty of Technology, Bielefeld University
11/07 - 05/08 Managing Director of DFG Cluster for Cognitive Interaction Technology, CITEC
03/06 - 07/06 Principal Scientist at Honda Research Institute Europe, Offenbach
since 06/02 Akademischer Rat (promoted to Oberrat 06/05, to Akad. Direktor 01/08) at Bielefeld University, Neuroinformatics Group, Faculty of Technology
09/96 - 06/02 Researcher at Bielefeld University
09/95 - 09/96 DAAD Scholarship at Electrotechnical University, St. Petersburg, Russia
10/93 - 09/95 Researcher at Bielefeld University

Education

July 2006 Habilitation “Stability, Learning, and Recurrency: from Neural Networks to Robot Architectures”, *venia legendi* in *Neuroinformatics*, Bielefeld University
June 1999 Dr. rer. nat., Faculty of Technology, Bielefeld University with dissertation on “Input-Output Stability of Recurrent Neural Networks”, graded “summa cum laude”
1987 - 1993 Diploma study program “Mathematics (2cnd: Slawistics)”, Bielefeld University

Research interests

cognitive and humanoid robotics, assistive systems, physical human-robot interaction, autonomous motor learning, neural networks and machine learning, digital production systems, future of work

EU-H2020/FP7 projects & coordinator roles

H2020 RobMoSys, CMCI - Composable Models for Compliant Interaction Control 10/2019-09/2020
H2020 644272 CogIMon: Cognitive Compliant Interaction in Motion, www.cogimon-project.eu
(8 partners, 4 countries, 02/2015-05/2019, 4 years, 7 Mill EUR funding, *coordinator*)
FP7-ICT IP no. 248311 AMARSi: Adaptive Modular Architectures for Rich Motor Skills
(10 partners, 6 countries, 03/2010-02/2014, 4 years, 7 Mill EUR funding, *coordinator*)
FP7-ICT IP ECHORD, MoFTaG (Model free trajectory generation), 11/2011-04/2013, *coordinator*
FP7-IRSES, CODEFOR, German-Japanese staff exchange program, 01/2014-12/2018
FP7-ECHORD++: CoHRoS - Cooperate programming for highly redundant robot systems, with Carl Cloos Schweissttechnik GmbH, 01/2015-06/2016, *coordinator*

Participation in large scale research projects

Project leader in NRW Fortschrittsskolleg „Gestaltung flexibler Arbeitswelten“ (2014-2018),
Coordinator for Human-Machine Interaction in BMBF leading edge cluster: Intelligent Technical Systems (regional industry-academia innovation cluster, funding 40 Mio EUR, 2012-2017),
scientific board of DFG Excellence Center in Cognitive Interaction Technology – CITEC (2008-2016), project leader in DFG special research units „Alignment in Communication“, „Situating Artificial Communicators“, project leader in DFG Graduate Programs 231 “Structure Formation”, 518 “Strategies and Optimization of Behavior”, 256 “Task Oriented Communication“

Selected funded industrial collaboration projects

2018 - 2021 „Softwareoptimierung mit Methoden der künstlichen Intelligenz“, IAV GmbH
07/2012 - 09/2016 „Flexibles Montagekonzept durch autonome mechatronische Fertigungs-
komponenten“, BMBF funded project with HARTING Technology Group
07/2012 - 03/2016 „Force Skill Learning“, R&D project with Honda Research Institute GmbH (HRI)
07/2010 - 10/2013 „Interaktive Bedienungshilfe in der ZSVA“, R&D project with Miele Professional
03/2008 - 02/2011 „Neural learning of flexible full body motion“, R&D project with Honda (HRI)

Patents

EP 1 801 731 „Adaptive scene dependent filters in online learning environments“, co-inventor
EP 2 224 303 „Task Space Selection for Robot Imitation“, co-inventor
EP 10153641.5 „Robot control with bootstrapping inverse kinematics“, co-inventor
DE 10201310042 „Verfahren zur Bestückung und zum Ausräumen einer Spülmaschine“, co-inventor

Selected activities, talks, workshops

associate editor of: Frontiers in Robotics & AI (2018-2020), IEEE Trans. Neural Networks & Learning Systems (2016-2018), IEEE Tran. Cognitive Developmental Learning (2016-2017)
guest-editor, session or workshop organizer: PC member of >40 conferences, sessions at IROS, ICRA, IEEE Humanoids, EU-ICT, ESANN, Cognitive Processing 2010, Neurocomputing 2004/05
ad-hoc reviewer: for IEEE: Neural Networks, Cognitive and Developmental Systems, Systems Man and Cybernetics A and B, AMD Circuits Systems I+II; Neural Computation, Neural Networks, Neurocomputing, Neural Processing Letters, Int. J. Systems Science, Int. J. Neural Systems, Robotics & Autonomous Systems, Int. J. Robotics Research, Autonomous Robots, J. Adv. Robotic Systems, etc
selected talks (only keynotes): Int. Conf. Artificial Neural Networks 2021, AI in Production 2019, Intrinsically Motivated Open-ended Learning 2019, Human Friendly Robotics 2016, Brazilian Congress on Computational Intelligence 2011, ProRisc 2006
fair exhibitions: Hannover Messe 2009-16, Forum Maschinenbau 2009-2014, Automatica 2010/12
teutolab-robotik: workshop program for school students (until 2016), www.teutolab-robotik.de
BMBF Zukunftsforum 2017: lead expert supporting citizen science, <http://www.zukunft-verstehen.de/>
BMBF Plattform Lernende Systeme: member of AG Arbeit, Mensch-Maschine Interaktion

Selected 10 publications

Transparent Integration of Real-time Control, Whole-body Motion Generation and Virtual Reality for Compliant Humanoids. Mohammadi P, Hoffmann E, Dehio N, Malekzadeh M, Giese M, Tsagarakis N, Steil JJ. *Robotics and Automation Magazin*. 2019, DOI: 10.1109/MRA.2019.2940970
Plug, Plan and Produce as Enabler for easy Workcell Setup and Collaborative Robot Programming in Smart Factories. Wojtynek M, Steil JJ, Wrede S. *KI - Künstliche Intelligenz* (Special Issue: Smart Production). 2019, DOI: 10.1007/s13218-019-00595-0
Goal-Related Feedback Guides Motor Exploration and Redundancy Resolution in Human Motor Skill Acquisition. Rhode M, Narioka K, Stein L, Steil JJ, Ernst M. *PLOS Comp. Biology*. 15(3):1-27, 2019
A user study on personalized stiffness control and task specificity in physical Human-Robot Interaction, S. Gopinathan & J.J. Steil, *Frontiers in Robotics and AI – Humanoid Robotics*, 2017
Hybrid Analytical and Data-driven Modeling for Feed-forward Robot Control. F.Reinhart & Z. Shareef and J.J. Steil, *Sensors*, 17(2), p. 311, 2017
Learning Robot Motions with Stable Dynamical Systems under Diffeomorphic Transformations. K. Neumann & J.J. Steil, *Robotics and Autonomous Systems*, 70, pp 1-15, 2015
Efficient exploratory learning of inverse kinematics on a bionic elephant trunk. M. Rolf & J.J. Steil, *IEEE Trans. Neural Networks and Learning Systems*, 25(6), pp. 1147-1160, 2014
A User Study on Kinesthetic Teaching of Redundant Robots in Task and Configuration Space. S. Wrede, C. Emmerich, R. Grünberg, A. Nordmann, A. Swadzba, and J.J. Steil, *Journal of Human-Robot Interaction*, vol. 2, Special Issue: HRI System Studies, pp. 56-81, 2013
Interactive Imitation Learning of Object Movement Skills. Mühlig, M., J.J. Steil, and M. Gienger, *Autonomous Robots*, vol. 32(2), pp. 97 –114, 2012
Situated Robot Learning for Multi-modal Instruction and Imitation of Grasping. J.J. Steil, F. Röthling, R. Haschke, H. Ritter, *Robotics & Autonomous Systems*, pp. 129-141, 2004