Tamim Asfour

Curriculum Vitae

Karlsruhe Institute of Technology

Institute for Anthropomatics and Robotics, High Performance Humanoid Technologies

✉ *asfour@kit.edu*
🖥 *www.humanoids.kit.edu*

Humanoids in the Real World

Academic Career

since 2012	**Full University Professor (W3)**, *Karlsruhe Institute of Technology*, Institute for Anthropomatics and Robotics, Chair for Humanoid Robotic Systems, High Performance Humanoid Technologies.
since 2018	**Visiting Professor**, *National University of Singapore*, Faculty of Engineering, Advanced Robotics Center, Singapore.
since 2016	**Distinguished Visiting Professor**, *Global Innovation Research*, Tokyo University of Technology and Agriculture, Tokyo, Japan.
2010 - 2012	**Adjunct Professor**, *Georgia Institute of Technology (Georgia Tech)*, College of Computing, School of Interactive Computing, Atlanta, USA.
2003 - 2011	**Post-doctoral researcher, senior researcher and lecturer**, *Karlsruhe Institute of Technology*, Institute for Anthropomatics and Robotics, Head of the Humanoids Research Group at KIT, Department of Informatics.
2001 - 2003	**Researcher and lecturer**, *Research Center for Information Technologies (FZI)*, Karlsruhe, Germany.
1996 - 2001	**Researcher and lecturer**, *University of Karlsruhe (TH)*, Department of Informatics, Germany.
1994 - 1996	**Researcher and lecturer**, *Damascus, Syria*.

Education

1997-2003	**Doctor of engineering degree (Dr.-Ing.)**, *Karlsruhe Institute of Technology*, Department of Informatics, Supervisors: Prof. Dr.-Ing. Rüdiger Dillmann and Prof. Dr.rer.nat. Alfred Schmitt.
1988-1994	**Engineering degree (Dipl.-Ing.)**, *Karlsruhe Institute of Technology*, Fakultät für Elektrotechnik und Informationstechnik, Control Systems Laboratory, Supervisor: Prof. Dr.-Ing. Volker Krebs and Prof. Dr.-Ing. Otto Föllinger.
May 1986 – Oct 1987	**German language course and Studienkolleg (foundation course)**, *Goethe Institute and University of Heidelberg, Germany*.
May 1985	**Final secondary-school examinations (Abitur)**, *Suweida, Syria*.

▬▬▬ Research Interests

Engineering humanoid robots: Engineering high performance 24/7 humanoid robots, co-joint perception-action representations, cognitive robotics, wearable robotics, software-hardware cognitive robot architectures, mechano-informatics of humanoids, system integration.

Grasping and dexterous manipulation: single, bimanual and whole-body grasping, motion and grasp planning, grasping known, familiar and unknown objects, vision and haptic based humanoid grasping, active vision and active touch, scene and object affordances, multimodal object and scene exploration, combinign task and motion planning.

Learning from human observation and experience: robot programming by demonstration, imitation learning capturing and representation whole-body human motion, human motion analysis and synthesis, semantic segmentation of human demonstrations, motion primitives and motion alphabets, data-driven generation of whole-body humanoid motion, learning from sensorimotor experience.

▬▬▬ Robotics Development Experience

Hardware

1999-2003	Developer of the humanoid Robots ARMAR-I (the first humanoid robot in Europe) and the humanoid Robots ARMAR-II
2004-2008	Chief developer of the humanoid robots ARMAR-IIIa, ARMAR-IIIb
2009-2013	Chief developer of the humanoid robots ARMAR-4
2013-2016	Chief developer of the wearable humanoid robot ARMAR-5 (whole-body exoskelton)
2016-2018	Chief developer of the humanoid robot ARMAR-6
2006	Development of the Karlsruhe Humanoid Head
2000-2001	Development of the under-actuated TUAT/Karlsruhe five-finger hand in cooperation with Prof. Toyama and Dr. N. Fukaya at the Tokai University in Japan
1998-1999	Development of the mobile service robot MORTIMER
2004-2008	Significant contributions to the design, position, torque, tactile sensor system and control of the fluidic Karlsruhe hand, which has been developed by Dr. S. Schulz and Prof. G. Bretthauer

Software

since 2011	Chief concept developer of the architecture of the robotics software framework ArmarX, `armarx.humanoids.kit.edu`
2000-2011	Developer of the ARMAR robots software architecture and its implementation based on MCA
since 2009	Development of the concept and architecture the KIT Whole-Body Human Motion Database, `motion-database.humanoids.kit.edu`
since 2009	Development of concept of the Master Motor Map (MMM) with the reference model of the human body, `mmm.humanoids.kit.edu`

Awards and Scholarships

2019 **Offer of Full Professorship and Director**, *National University of Singapore, The NUS Robotics Institute*, Singapore.

2011 **Offer of Full Professorship**, *Georgia Institute of Technology, College of Computing, School of Interactive Computing*, Atlanta (USA) and Metz (France).

2018 **Faculty Teaching Award**, *KIT-Department of Informatics (Fakultätslehrpreis)*.

2019 **Best paper award finalist**, *In International Conference on Humanoid Robots (Humanoids)*.

2018 **Best paper award finalist (Cognitive Robotics)**, *In IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS))*.

2016 **Best paper award finalist**, *In International Conference on Humanoid Robots (Humanoids)*.

2015 **Best paper award finalist**, *International Conference on Advanced Robotics (ICRA)*.

2014 **Offer from a giant IT company**, *Leader of robotics research and development strategy*.

2014 **Best poster award**, *International Conference on Social Robotics (ICSR)*.

2014 **Best poster award**, *NextMed Medice Meets Virtual Reality (MMVR)*.

2010 **Best paper award**, *International Conference on Simulation, Modeling, and Programming for Autonomous Robots (SIMPAR)*.

2009 **Best paper award**, *IEEE-RAS International Conference on Humanoid Robots, (Humanoids)*.

2003 **Award of the „Förderverein FZI"**, *Research Center for Information Technologies, Karlsruhe, Germany, for outstanding dissertation in Informatics in 2003*.

1986 **Best-10 Scholarship of Syria**, *to study at the University of Karlsruhe, Germany.*.

1990-today **Best lecture award**, *More than 30-time winner of the Best Lecture Prize at the KIT-Department of Informatics for the lectures „Mechno-Informatics and Robotics", „Practical Course on Mobile Robots", and „Practical Course Lego Mindstorms ", „Lecture and Exercises Digital Circuits Design"and „Lecture and Exercises Computer organization", Fakultätslehrpreis 2018*.

Competences, Community Services and Editorial Work

Competences

since 2017 **Member**, *DFG grants Committee on Research Training Groups*, German Research Foundation (DFG).

since 2016 **President**, *German Robotics Society (DGR: Deutsche Gesellschaft für Robotik)*.

2013–2015 **Member**, *Founding Board of Directors of euRobotics asibl*.

since 2017 **Scientific Spokesperson**, *KIT Center Information · Systems · Technologies (KCIST)*, `www.kcist.kit.edu`.

since 2015 **Scientific Coordinator**, *research topic Robotics and Automation in KCIST* .

2011-2016 **Deputy Spokesperson**, *and member of Principle Investigator Board of the KIT-Focus Anthropomatics and Robotics*.

since 2006	**Grant proposal and project evaluator**, *for several funding agencies and universities such as German Research Foundation (Deutsche Forschungsgemeinschaft, DFG), European Commission (FET Open, H2020, FP7, Robotics and Cognitive Systems), European Research Council (ERC), Japan Society for the Promotion of Science (JSPS) - Specially Promoted Research, Swiss National Science Foundation, France National Agency for Research (Agence Nationale de la Recherche, ANR, CNRS), the The Netherlands Organisation for Scientific Research (NWO), the Natural Sciences and Engineering Research Council of Canada (NSERC), the Danish Council for Strategic Research, Vienna Science and Technology Fund (WWTF), Foundation for Scientific Research Belgium (FWO), ...*

Service to Academic Community

2018–now	**Member**, *Administrative Committee (AdCom) IEEE Robotics and Automation Society.*
2016–now	**Co-chair**, *Chapter and International Activities Committee of IEEE Robotics and Automation Society.*
2011–2014	**Co-Chair**, *IEEE-RAS Technical Committee on Humanoid Robotics.*
2009–now	**Chair**, *Steering Committee of the IEEE-RAS Conference on Humanoid Robotics.*
2014–now	**Moderator**, *mailing lists* `robotics-worldwide` *(with Stefan Schaal, Jan Peters and Michael Mistry as well as* `humanoids-worldwide`*.*
since 2009	**Member**, *IEEE-RAS Technical Committees on Humanoid Robotics; Robot Learning; Mobile Manipulation; Human Movement Understanding; Robotic Hands, Grasping and Manipulation.*

Service to the University

since 2015	**Sounding Board member**, *KIT 2025 umbrella strategy for research, education and innovation.*
since 2017	**Scientific Spokesperson**, *KIT Center Information · Systems · Technologies (KCIST),* `www.kcist.kit.edu`.
2011-2016	**Deputy Spokesperson**, *and member of Principle Investigator Board of the KIT-Focus Anthropomatics and Robotics.*
2014-2019	**Council member**, *Division II – Informatics, Economics, and Society at KIT*, Representative of the Institute of Anthropomatics and Robotics.
since 2014	**Executive Board**, *Foundation for Gifted Informatics Students in Karlsruhe.*

Editorial Work

2019–now	**Deputy Editor-in-Chief**, *IEEE-RAS Robotics and Automation Letters (RA-L).*
2014–now	**Founding Editor-in-Chief**, *IEEE-RAS Humanoid Conference Editorial Board.*
2014–now	**Co-Initiator**, *and member of the Editorial Board of Frontiers in Humanoid Robotics.*
2014-2015	**Guest Editor**, *Frontiers in Robotics and AI, Special Issue Software Architectures for Humanoid Robotics.*
2014-2015	**Guest Editor**, *Advanced Robotics, Special Issue on Humanoid Robotics.*

2007-2008	**Guest Editor**, *International journal of humanoid robotics, Special Issue Toward Cognitive Humanoid Robots.*
since 2016	**Editor**, *IEEE Robotics and Automation Letters, RA-L.*
2010-2014	**Associate Editor**, *IEEE Transactions on Robotics.*
2009–now	**Associate Editor**, *IEEE International Conference on Robotics and Automation, ICRA.*
2010–now	**Associate Editor**, *IEEE/RSJ International Conference on Intelligent Robot Systems, IROS.*
since 2001	**Reviewer**, *for several* **journals** *(IEEE Transactions on Robotics, Science Robotics, Nature Machine Intelligence, Humanoid Robots, Robotics Research, Autonomous Robots, Robotics and Autonomous Systems, Advanced Robotics, Humanoid Robotics, Transactions on System, Man and Cybernetics, Biological Cybernetics, PLoS ONE, Transactions on Autonomous Mental Development, Transaction of Mechantronics, Transactions on Industrial Electronics, Intelligent and Robotic Systems, Robotica, Systems Architecture, it Information Technologie and at-Automatisierungstechnik), ... and for several* **conferences** *(IEEE-RAS International Conference on Humanoid Robots, on Robotics and Automation (ICRA), on Intelligent Robots and Systems (IROS), Robotics: Science and Systems (RSS), ACM/IEEE Intern. Conf. Human-Robot Interaction (HRI), IEEE Intern. Conf. on Development and Learning (ICDL), Intern. Conf. on Autonomous Agents and Multiagent Systems (AAMAS), ...*

Program Committee

Program Chair	International Symposium on Assistive and Wearable Robotics, 2019
	IEEE International Conference on Humanoid Robots, 2013
	International Conference on Cognitive Systems, 2008
General Co-Chair	International Symposium on Robotics Research 2019
	IEEE International Conference on Robotics and Automation, 2016
	International Symposium on Robotics and German Conference on Robotics, 2016
	IEEE International Conference on Humanoid Robots, 2018
Senior Program Committee	IEEE International Conference on Robotics and Automation, (2016, 2017, 2018)
	IEEE/RSJ International Conference on Intelligent Robot Systems (2015, 2016, 2018)
Program Co-Chair	IEEE International Conference on Humanoid Robots (2007, 2009, 2011,2015)
	IEEE/RSJ International Conference on Intelligent Robot Systems (2015, 2018)
	International Symposium on Robot and Human Interactive Communication, 2011
Program Committee	International Symposium on Robotics Research (2015, 2017)
	IEEE/RSJ International Conference on Intelligent Robot Systems (2014, 2018)
	International Conference on Robotics and Automation 2018
	Robotics: Science and Systems, (2014, 2015, 2016)
	DGR Days – Robotics in Germany (2010, 2011, 2013, 2016, 2017)
	International Symposium on Robotics and German Conference on Robotics (2014, 2016, 2018)
	International Conference on Cloud and Robotics, 2016
	Annual German Conference on AI, 2012

Local Chair	IEEE International Conference on Robotics and Automation, 2013
	DGR Days, 2010
	International Conference on Cognitive Systems, 2008

Organized Workshops/Symposia

2019 CYBATHLON Symposium on Assistive and Wearable Robotics, Karlsruhe, 2019
Workshop – Bringing perception-based manipulation to the real world: standardizing robot manipulation learning, ICRA 2019
Workshop – Different Approaches, the Same Goal: Autonomous Object Manipulation, IROS 2019

2018 Symposium – Robotics AI – Data Science versus Motion Intelligence, Academie des Science and National Akademie der Wissenschaften (Leopoldina), Paris
Workshop – The Intelligence of Touch: Haptics, Tactile, Interaction – Building the Global Picture, IROS 2018
Workshop – Innovations in H2020 projects, European Robotics Forum, Tampere, Finland

2016 Workshop – Robotics in the 21st century: Challenges and Promises, Göttingen, Germany
Workshop – Transfer of Cognitive Robotics Research to Industrial Applications, European Robotics Forum, Ljubljana, Slovenia

2015 Workshop – Transfer of Cognitive Robotics Research to Industrial Assembly and Service Robots, IROS 2015
Workshop – Semantic Policy and Action Representations (SPAR) for Autonomous Robots, IROS 2015
Workshop – Learning Reusable Concepts in Robotics, Rome, Italy, RSS 2015

2014 Workshop – Cognitive Humanoid Robotics Research, Madrid, Spain, Humanoids 2014
Workshop – Active Visual Learning and Hierarchical Visual Representations for General-Purpose Robot Vision, Hong Kong, China, ICRA 2014

2013 Workshop – Physical assistive devices: Model-based simulation and optimization, Tokyo, Japan, IROS 2013
Workshop – From Experience to Concepts and Back, Berlin, Germany, RSS 2013

2012 Workshop – On Real World Challenges for Humanoids, Osaka, Japan, Humanoids 2012

2011 Workshop – New Bodies for Cognitive Humanoids, Bled, Slovenia, Humanoids 2011

2010 Workshop – Humanoids: What's next? Applications, Challenges and Perspectives, Nashville, USA, Humanoids 2010
Workshop – Representations for object grasping and manipulation, Anchorage, USA, ICRA 2010

2009 Workshop – Object-Action Complexes: Representations for Grounding Perception by Action and Grounding of Language by Interaction, Paris, France, Humanoids 2009
Workshop – Approaches to Sensorimotor Learning on Humanoid Robots, Kobe, Japan, ICRA 2009

2008	Workshop – Imitation and Coaching in Humanoid Robots, Daejeon, Korea, Humanoids 2008
	Workshop – Robot Simulators: Available Software, Scientific Applications and Future Trends, Nice, France, IROS 2008
2007	Workshop – Benchmarking in Humanoid Robotics, Pittsburgh, USA, Humanoids 2007
2006	Workshop – Towards Cognitive Humanoid Robots, Genoa, Italy, Humanoids 2006
2005	Workshop – Cognitive Architecture for Humanoids, Tsukuba, Japan, Humanoids 2005
2004	Workshop – Building Humanoid Heads, Santa Monica, USA, Humanoids2004

Research Projects and Funding

German Research Foundation, DFG

2004–2012 **DFG, German Collaborative Research Center on Humanoid Robots (SFB 588)**, *Scientific leader and coordinator of the project R1 (machatronics, control, motion and grasp planning, and system integration) and R6 (Body balancing and coordination of manipulation and locomotion)*

Contributions: Specification, design and realisation of the humanoid robot series (ARMAR-I, ARMAR-II, ARMAR-IIIa, ARMAR-IIIb, ARMAR-IV), software and hardware architecture, kinematics control, position/force control. Visual servoing, vision-based grasping, single and dual arm manipulation, motion planning, programming by demonstration, system integration. Leader of the working groups „Demonstrator and System Integration"and „Robot Design (Konstruktionsbüro)", budget 1.106.900 €.
`www.sfb588.uni-karlsruhe.de`

2010– **DFG, Transregional Collaborative Research Center on Invasive Computing (SFB/TR 89)**, *Scientific leader and Principle Investigator, project D1 (Invasive Software-Hardware Architectures for Robotics)*

Contributions: *Implementation of a cognitive robot control architecture with its different processing hierarchies and exploration of self-organization techniques on many-core systems, speculative resource management and resource-aware robot motion planning*, budget 518.400 €.
`www.invasic.de`

2012–2019 **DFG, Priority Program on Autonomous Learning (SPP 1527)**, *Scientific leader and Principle Investigator, REBA (Robots Exploring their Bodies Autonomously) and REBA+ (REBA (Robots Exploring Tools as Extension of their Bodies Autonomously)*

Contributions: Learning of sensorimotor maps for the body schema of humanoid robots, tool use, integration of vision and haptics to allow robot to explore and learn about their own bodies, budget 400.000 €.
`autonomous-learning.org`

Federal Ministry for Education and Science in Germany BMBF

2019–2022 **BMBF, OML**, *Organic Machine Learning*, Scientific leader and coordinator the tasks related to incremental learning learnign in the context of robot programming by demonstration.

Contributions: Methods for learning skills from human demonstration and their adaptation based on experience and verbal human instruction. This includes learning object-action relations as well as bidirectional mapping between whole-body human motion and natural language., budget 750.000 €.

2018–2022 **BMBF, Competence Center ROBDEKON**, *Robotic systems for the decontamination in hazardous environments*, Scientific leader and coordinator the development of new intelligent hand prostheses

Contributions: Methods for visual perception, extraction of grasp affordances, semantic scene understanding, grasp and motion planning, autonomous execution of decontamination tasks as well as the design of robotic-centered solutions for decontamination tasks., budget 750.000 €.

2016–2021 **BMBF, Innovation Cluster INOPRO**, *Intelligent Orthetics und Prosthetics for an Improved Human-Machine-Interaction*, Scientific leader and coordinator of the development of new intelligent hand prostheses.

Contributions: Development of advanced personalized hand prostheses with semi-autonomous grasping capabilities based on experience gained from the research in the area of humanoid robotics. Additional contribution to the control mechanisms of lower limb protheses and ortheses, budget 1.476.099 €.

European Union, Robotics, Cognitive Systems and AI

2017–2021 **EU, TERRINet**, *TERRINet: The European Robotics Research Infrastructures Network*, Principle Investigator, H2020 Integrated EU-Project

Contributions: The European Robotics Research Infrastructures Network (TERRINet) proposal aims at building a world-class network with harmonised services and complementary capabilities where talented researchers from academia and industry worldwide will have access and will be able to explore new ideas and establish personal and joint projects; to get in contact with and be inspired by leading and creative scientists, technologists, experts and industrial representatives; to share information and gain knowledge for boosting their scientific research and potential for technological innovation. KIT leads the activities on setting up the Robotics Research Infrastructure, grant no. 730994, budget 385.250 €.

2017–2021 **EU, IMAGINE**, *IMAGINE: Robots Understanding Their Actions by Imagining Their Effects*, Principle Investigator, H2020 Integrated EU-Project

Contributions: Development of a multi-functional gripper for disassembly of electro-mechanical devices and appliances including its hardware and software architecture. Grasp planning and grasp synthesis, learning action representations for adaptive disassembly actions from human observation; system integration and benchmarking, grant no. 731761, budget 667.500 €.
www.imagine-h2020.eu

2015–2020 **EU, SecondHands**, *A Robot Assistant for Industrial Maintenance*, Principle Investigator, H2020 Integrated EU-Project

Contributions: Mechatronics Development of a humanoid robot for maintenance tasks in warehouse environment, highly integrated sensor-actor-controller units with torque control, under-actuated five-finger hands, software and hardware architecture, grasping of familiar and unknown objects, handover tasks, mobile manipulation, robot software and hardware control architecture, grant no. 611909, budget 2.249.750 €.
`www.secondhands.eu`

2015–2018 **EU, TimeStorm**, *Mind and Time – Investigation of the temporal attributes of human-machine synergetic interaction*, Principle Investigator, H2020 FET-Proactive EU-Project

Contributions: Develop methods to endow robots with the capability to experience the flow of time which is still largely unexplored. The inability of existing systems to perceive time constrains their potential understanding of the inherent temporal characteristics of the dynamic world, which in turn acts as an obstacle to their symbiosis with humans. Equipping artificial agents with temporal cognition establishes a new framework for the investigation and integration of knowing, doing, and being in artificial systems, grant no. 641100, budget 543.750 €.
`timestorm.eu`

2015–2017 **EU, I-Support**, *ICT-Supported Bath Robots*, Principle Investigator, H2020 EU-Project, Personalizing Health and Care (PHC)

Contributions: Methods for learning motor skills from human observation and their force-based adaptation for the I-SUPPORT robotic shower technology for senior citizens who are increasingly getting frail and, are still able to live independently but experience mild or medium functional disabilities and increasing difficulty in performing daily activities, notably showering or bathing, grant no. 643666, budget 412.875 €.
`www.i-support-project.eu`

2013–2017 **EU, WALK-MAN**, *Whole-body Adaptive Locomotion and MANipulation*, Principle Investigator, FP7 Integrated EU-Project

Contributions: Multimodal perception for loco-manipulation tasks and the representation of whole-body affordances. Learning representation of sensorimotor experience, which binds objects, action in loco-manipulation tasks. Transfer of grasping representations to balancing, grant no. 611832, budget 968.760 €.
`www.walk-man.eu`

2013–2016 **EU, KoroiBot**, *Improving humanoid walking capabilities by human-inspired mathematical models, optimization and learning*, Principle Investigator, FP7 Integrated EU-Project

Contributions: Establishment of large scale human walking database and the development of human and humanoid models as basis for general motion and transfer of human motion to humanoid robots with different morphologies, detection and classification of disturbances applied to humans during walking, human-inspired strategies for push recovery, role of prediction in walking., grant no. 611909, budget 543.580 €.
`www.koroibot.eu`

2011–2015 **EU, Xperience**, *Robots Bootstrapped through Learning from Experience*, **Coordinator** and Principle Investigator, FP7 Integrated EU-Project

Contributions: learning from experience, structural bootstrapping, bimanual manipulation, haptic exploration, cooperative perception for scene interpretation, action synthesis using natural language processing techniques, cognitive control architecture for humanoid robots and system integration. Work in a interdisciplinary consortium (neuroscience, linguistic, cognitive vision and robotics), grant no. 270273. Total budget 7.634 € millions, own budget:1.8 € millions.
`www.xperience.org`

2011–2012 **EU, RoboCom**, *European Flagship initiative on* Robot Companion for Citizen, Coordinator of the working group *Body* and Wearable Companions, FET Flagship

Contributions: Roadmap for bodyware for future robotics technologies, in particular wearable robot technologie, grant no. 284951, budget 50.289 €.
`www.robotcompanions.eu`

2008–2012 **EU, GRASP**, *Emergence of Cognitive Grasping through Emulation, Introspection, and Surprise*, Scientific Manager and Principle Investigator, FP7 Cognitive Systems Integrated EU-Project

Contributions: Grasp planning, human-inspired grasping, imitation of human grasping activities, learning of body schema, simulation, system integration, grant no. 215821, budget 836.960 €.
`www.grasp-project.eu`

2006–2010 **EU, PACO-PLUS**, *Perception, Action and Cognition through Learning of Object-Action Complexes*, **Co-coordinator** and Principle Investigator, FP6 Cognitive Systems Integrated EU-Project

Contributions: Technical implementation of Object-Action Complexes (OAC, pronounced: oak) - a new paradigm proposed in the project to capture the interaction between objects and associated actions. OACs are to be used as unified framework and basis for symbolic representations of sensorimotor experience. Visuo-haptic object exploration. Action representations for goal-directed imitation. Cognitive control architecture and system integration. Work in a interdisciplinary consortium (neuroscience, cognitive psychology, linguistic, cognitive Vision and robotics) , grant no. 027657, Total budget 7.477.200 € millions, budget 1.336.538 €.
`www.paco-plus.org`

2006–2009	**EU, InterLink**, *European Coordination Action InterLink (International Cooperation Activities in Future and Emerging Information and Communication Technologies)*, Co-coordinator of the working group *Intelligent and Cognitive Systems, FET Open*
	Contributions: Report on road-mapping research in Intelligent and Cognitive Systems to serve as input for Horizon 2020 programm of the European Union, grant no. 034051, budget 60.109 €. `interlink.ics.forth.gr`

List of Talks

Plenary and Keynote Lectures

06.11.2019	IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), *Engineering Humanoids*, Macau
20.09.2016	IEEE International Conference Developmental Learning and Epigenetic Robotics, *Engineering humanoids that grasp, learn and perceive time*, Cergy-Pontoise/Paris, France
16.12.2013	International Symposium on Robotics Research, *It's All about Force and Humanoids*, Singapore
01.09.2009	International Symposium on Robotics Research, *From Sensorimotor Primitives to Imitation and Manipulation Strategies in Humanoid Robots*, Luzern, Switzerland
02.08.2008	IEEE International Symposium on Robot and Human Interactive Communication, *Manipulation Strategies and Imitation Learning in Humanoid Robots*, Munich, Germany

Invited Talks

2006-now	More than invited 150 scientific talks at workshops, conferences, etc.
2006-now	More than invited 75 talks for public

Teaching

I developed the curriculum for several new lectures at KIT and contributed significantly to existing lectures in robotics and computer engineering.

Robotics, Cognitive Systems and Artificial Intelligence

2012–	Lecture – Robotics I: Fundamental of Robotics (winter term)
2012–2015	Lecture – Robotics II: Robot Programming (summer term)
2016–	Lecture – Robotics II: Humanoid Robotics (summer term)
2015–	Lecture – Robotics III: Perception in Robotics (summer term)
2014–	Lecture – Wearable Robotics Technologies (summer term)
2014–	Lecture – Mechano-Informatics and Robotics (winter term)
2012–	Seminar – Humanoid Robotics (winter term)
2015–	Seminar – Motion in Man and Machine (summer term)
2012–	Practical course – Robotics (summer term)
2012–	Practical course – Humanoid Robotics (winter term)
2012–	Practical course – Mobile Robots (summer term)

2012–	Practical course – Lego Robots (winter term)
2012–	Practical course – Praxis of Software Development (winter and summer term)
2014–	Special course – Praxis of Research (winter and summer term)
2005–2011	Lecture – Robotics I: Teaching assistant to Prof. R. Dillmann (winter term)

Computer Engineering

2012–	Lecture – Digital Circuit Design (Every winter term)
2012–	Lecture – Computer Organization (Every summer term)
1996–2011	Teaching assistant of the Lecture – Digital Circuit Design (winter term)
1996–2011	Teaching assistant of the Lecture – Computer Organization (summer term)

Robotic Activities at Schools

| 2016– | Lecture and practical course on Robotics *AG: Robotik – Informatik zum Anfassen*, (School kids in the 6-8 class) |

Overview of my current lectures is available at:

http://h2t.anthropomatik.kit.edu/english/28.php

Post-Doc Supervision

2019–now	Simon Ottenhaus; Dr.-Ing.
2019–now	Jonas Beil, Dr.-Ing.
2019	Lukas Kaul, Dr.-Ing. (now with Toyota Research Institut, USA)
2017–2018	Peter Kaiser, Dr.-Ing. (now with DeepL, Germany
2017–2019	Mirko Wächter, Dr.-Ing. (now with FRANKA EMIKA)
2017–2018	Christian Mandery, Dr.-Ing. (now with Union Investment, Germany
2016–2018	Ömer Terlemez, Dr.-Ing.
2011–2017	Nikolaus Vahrenkamp, Dr.-Ing. (now with Sick AG, Germany)
2015–2017	Eren Erdal Aksoy, Dr.-rer.nat (now Assistant Professor, Sweden)
2014–2017	Julia Borras Sol, Dr. (now at UPC, Barcelona, Spain)
2016–2017	Manfred Kröhnert, Dr.-Ing. (now with Bosch, Germany)
2016	David Schiebener, Dr.-Ing. (now with Dematic, Germany)
2014–2016	Martin Do, Dr.-Ing. (now with Sick AG, Germany)
2011–2014	Kai Welke, Dr.-Ing.
2014–2015	Stefan Ulbrich, Dr.-Ing.
2013–2015	David Gonzalez, Dr.-Ing. (now with Intel, USA)
2008–2009	Pedram Azad, Dr.-Ing. (now with Keyetech, Germany)

Ph.D. Students Supervision

2019–now	Franziska Krebs; Human-Inspired grasping and manipulation
2019–now	Andre Meixner; Learning bidirectional mapping between langauge and action
2019–now	Rainer Kartmann; Learning object relations
2019–now	Christian Dreher; Action recognition of bimanual tasks
2018–now	Kevin Hitzler; Machine learning for manipulation action planning
2018–now	Christoph Pohl; Semantic visual scene understanding
2018–now	Jiafeng Gao; Reinforcement learning for compliant collaborative tasks
2018–now	Cornelius Klas; Innovative gripper and hand design
2018–now	Felix Hundhausen; Highly integrated embedded systems for robotics
2018–now	Raphael Grimm; Grasping, manipulation and manipulating planning
2017–now	Julia Starke; Semi-autonomous grasping for prosthetic hands
2017–now	Isabel Ehrenberger; Action recogntion and prediction in wearable robotics
2014–now	Markus Grotz; Active vision for scene understanding
2016–now	Fabian Paus; Active vision for whole-body grasping
2015–now	Samuel Rader; Requirement-oriented design of humanoid robots
2017–now	Pascal Weiner; Embedded systems design and haptics for humanoid hands and prothesis
2016–now	Zhou You; Learning and Adaptation of Movement Primitives for Robotics
2013–2019	Jonas Beil; Kinematisch kompatible Gelenkmechanismen für Exoskelette der unteren Extremitäten
2014–2018	Lukas Kaul; Human-inspirited balancing and recovery stepping for humanoid robots
2014–2017	Christian Mandery; Data-driven generation of humanoid motion based on large scale motion databases
2014–2019	Simon Ottenhaus; Visuo-haptic grasping of unknown objects through exploration and learning on humanoid robots
2014–2017	Peter Kaiser; Whole-body affordances for locomotion and manipulation tasks
2013-2015	Katehrina Hertkorn; Shared grasping: a combination of telepresenece and grasp planning, co-supervised together with Prof. G. Hirzinger, DLR
2011–2017	Mirko Wächter; Learning and execution of manipulation tasks on humanoid robots
2009-2016	Ömer Terlemez; Reference model of the human body for the transfer of human motions to humanoid robots
2008–2014	Stefan Ulbrich; Sensorimotor learning of body scheme of humanoid robots, co-supervised together with Prof. R. Dillmann
2008–2013	Markus Przybylski; Grasp planning based on object symmetry features, co-supervised together with Prof. R. Dillmann
2007–2013	David Gonzalez; Model-based environmental visual perception for humanoid robots, co-supervised together with Prof. R. Dillmann
2006–2011	Kai Welke; Memory-based active visual search for humanoid robots, co-supervised together with Prof. R. Dillmann

2006–2011	Nikolaus Vahrenkamp; Motion planning and sensory-based execution of grasping tasks on humanoid robots, co-supervised together with Prof. R. Dillmann
2006-2011	Alexander Bierbaum; Haptic exploration of unknown objects with a five-fingered humanoid hand, co-supervised together with Prof. R. Dillmann
2005–2008	Pedram Azad; Visual perception for manipulation and imitation on humanoid robots, co-supervised together with Prof. R. Dillmann
2004–2010	Kristian Regenstein; Embedded hardware architectures for humanoid robots, co-supervised together with Prof. R. Dillmann

Thesis Evaluation & Committee at other Universities

2019	Dieter Büchler; *Robot Learning for Muscular Systems*, Technische Universität Darmstadt, Germany
2019	Wolfgang Xavier Merkt; *Bootstrapping Optimal Motion Synthesis in Complex and Shared Environments*, University of Edinburgh, UK
2019	Christof Elbrechter; *Towards Anthropomorphic Robotic Paper Manipulation*, Universität Bielfeld, Germany
2019	Sariah Mghames; *Towards the Development of Variable Stiffness Actuated Spherical Joints for Humanoids and humans*, Universita' di Pisa, Italy
2019	Steffen Schütz; *CARL – A Compliant Robotics Leg Designed for Human-Like Bipedal Locomotion*, Technische Universität Kaiserslautern, Germany
2018	Ganesh Gowrishankar; *Human Centric Robotics – Developing machines that understand human behavior*, University Montpellier, France, *(Habilitation)*
2018	Roberto Martin-Martin; *Leveraging Problem Structure in Interactive Perception for Robot Manipulation of Constrained Mechanism*, Technische Universität Berlin, Germany
2018	Qujiang Lei; *Feature-Based Fast Grasping for Unknown Objects*, Technical University Delft, Netherlands
2017	Miha Denisa; *Discovery and Synthesis of New Robot Control Policies through Search in a Hierarchical Database of Example Movements*, Jozef Stefan Institute, Ljubljana, Slovenia
2017	Timothee Habra; *Gaze Stabilization for Humanoid Robots based on internal models*, Ecole Polytechnique de Louvain, Belgium
2017	Diana Serra; *Motion Planning and Control Methods for Nonprehensile Manipualtion and Multi-Contact Locomotion Tasks*, Universitá degli Studi die Napoli federico II, Italy
2017	Paul Johny; *Image Processing on Heterogeneous Multiprocessor System-on-Chip using Resource-aware Programming*, Technische Universität München, Germany
2017	Jonathan Feng-Shun Lin; *Temporal Segmentation of Human Motion for Rehabilitation*, University of Waterloo, Canada
2016	Achim Rettinger; *Comparing the Incomparable – Learning to compare Semantic Relatedness across languages, Images and Knowledge Graphs*, KIT, Germany, *(Habilitation)*

2016   Mohamad Javad Aein; *Development and analysis of a library of actions for robot arm-hand systems*, Georg-August-Universität Göttingen, Germany

2016   Anshul V. Joshi; *WPCA: The Wreath Product Cognitive Architecture*, The University of Utah, USA

2016   Ravin de Souza; *Grasping for the Task: Human Principles for Robot Hands*, Ecole Polytechnique Federale de Lausanne (EPFL), Switzerland

2016   Alberto Isay Romay Tovar, *An Object Template Apporach to Manipaultion for Semiautonomous Avatar Robots*, Technische Universität Darmstadt, Germany

2014   John Nassour; *Success-Failure Learning for Humanoid: Study on Bipedal Walking*, Technical University Munich, Germany

2014   Mario Gianni; *Multilayered Cognitive Control for Unmanned Ground Vehicles*, Sapienza Universita di Roma, Italy

2013   Katharina Mülling; *Modeling and Learning of Complex Motor Taks: A Case Study with Robot Table Tennis*, Technical University Darmstadt, Germany

2012   Maja Rudinac; *Modeling and Learning of Complex Motor Taks: A Case Study with Robot Table Tennis*, University Delft, Netherlands

2012   PhD students of the dorctoral students on Robotics, Neuroscience and Nanotechnologies, Italian Institut of Technology, Italy

2011   Silvia Cecilia Tapia Siles; *Robotic locomotion in turbulent flow*, Istituto Italiano di technologia, Italy and Universite Pierre et Marie Curie, France

2011   Manuel Mühling; *A Whole Systems Approach to Robot Imitation Learning of Object Movement Skills*, University of Bielefeld, Germany

2010   Jimmy Alison Jørgensen; *MoveBots – Flexible Object Handling using Dexterous Grippers*, University of Southern Denmark, Maersk Mc-Kinny Moller Institute, Denmark

2009   Florent Guenter; *Using Reinforcment Learning for Optimizing the Reproduction of Tasks in Robot Programming by Demonstartion*, Ecole Polytechnique Federale de Lausanne (EPFL), Switzerland

2009   Mario Ricardo Arbulu Saavedra; *Stable Locomotion of Humanoid Robots based on Mass Concentrated Model*, Universidad Carlos III de Madrid, Spain

Languages

Arabic	**mother tongue**
German	**near native, fluent**
English	**fluent**
Italian	**basic**

List of Publications

Peer-Reviewed Journals

[1] Christian R. G. Dreher, Mirko Wächter, and Tamim Asfour. Learning object-action relations from bimanual human demonstration using graph networks. *IEEE Robotics and Automation Letters (RA-L)*, 5(1):187–194, 2020.

[2] Pascal Weiner, Caterina Neef, Yoshihisa Shibata, Yoshihiko Nakamura, and Tamim Asfour. An embedded, multi-modal sensor system for scalable robotic and prosthetic hand fingers. *Sensors*, 20(1):108–121, 2019.

[3] Julia Starke, Christian Eichmann, Simon Ottenhaus, and Tamim Asfour. Human-inspired representation of object-specific grasps for anthropomorphic hands. *International Journal of Humanoid Robotics (IJHR)*, 2019.

[4] Steffen Ringhof, Isabel Patzer, Jonas Beil, Tamim Asfour, and Thorsten Stein. Does a passive unilateral lower limb exoskeleton affect human static and dynamic balance control? *Journal Frontiers in Sports and Active Living, section Biomechanics and Control of Human Movement*, 1(22), September 2019.

[5] Immaculada Llop-Harillo, Antonio Pérez-González, Julia Starke, and Tamim Asfour. The anthropomorphic hand assessment protocol (ahap). *Robotics and Autonomous Systems*, 121:103259, 2019.

[6] Tamim Asfour, Mirko Wächter, Lukas Kaul, Samuel Rader, Pascal Weiner, Simon Ottenhaus, Raphael Grimm, You Zhou, Markus Grotz, and Fabian Paus. ARMAR-6: A High-Performance Humanoid for Human-Robot Collaboration in Real World Scenarios. *IEEE Robotics & Automation Magazine*, 26(4):108–121, 2019.

[7] Mirko Wächter, Ekaterina Ovchinnikova, Valerij Wittenbeck, Peter Kaiser, Sandor Szedmak, Wail Mustafa, Dirk Kraft, Norbert Krüger, Justus Piater, and Tamim Asfour. Integrating multi-purpose natural language understanding, robot's memory, and symbolic planning for task execution in humanoid robots. *Robotics and autonomous systems*, 99:148–165, 2018.

[8] Nikolaus Vahrenkamp, Eduard Koch, Mirko Wächter, and Tamim Asfour. Planning High-Quality Grasps using Mean Curvature Object Skeletons. *IEEE Robotics and Automation Letters (RA-L)*, 3(2):911–918, 2018.

[9] Nadine Schlichting, Atser Damsma, Eren Erdal Aksoy, Mirko Wächter, Tamim Asfour, and Hedderik van Rijn. Temporal context influences the perceived duration of everyday actions: Assessing the ecological validity of lab-based timing phenomena. *Journal of Cognition*, 1(2):1–10, January 2018.

[10] Jonas Rothfuss, Fabio Ferreira, Eren Erdal Aksoy, You Zhou, and Tamim Asfour. Deep episodic memory: Encoding, recalling, and predicting episodic experiences for robot action execution. *IEEE Robotics and Automation Letters (RA-L)*, 3(4):4007–4014, October 2018.

[11] Matthias Plappert, Christian Mandery, and Tamim Asfour. Learning a bidirectional mapping between human whole-body motion and natural language using deep recurrent neural networks. *Robotics and Autonomous Systems*, 109:13–26, 2018.

[12] Simon Ottenhaus, Lukas Kaul, Nikolaus Vahrenkamp, and Tamim Asfour. Active Tactile Exploration Based on Cost-Aware Information Gain Maximization. *International Journal of Humanoid Robotics (IJHR)*, 15(1):1–21, 2018.

[13] C. Laschi, B. Mazzolai, N. Nosengo, V. Delle Cave, T. Asfour, D. Floreano, S. Stramigioli, J. Laumond, and S. Hauert. The Rise of the Robots: The European Robotics Flagship. *IEEE Robotics Automation Magazine*, 25(4):121–122, Dec 2018.

[14] Adrian Knobloch, Nikolaus Vahrenkamp, Mirko Wächter, and Tamim Asfour. Distance-Aware Dynamically Weighted Roadmaps for Motion Planning in Unknown Environments. *IEEE Robotics and Automation Letters (RA-L)*, 3(3):2016–2023, July 2018.

[15] Rainer Kartmann, Fabian Paus, Markus Grotz, and Tamim Asfour. Extraction of physically plausible support relations to predict and validate manipulation action effects. *IEEE Robotics and Automation Letters (RA-L)*, 3(4):3991–3998, October 2018.

[16] Peter Kaiser and Tamim Asfour. Autonomous detection and experimental validation of affordances. *IEEE Robotics and Automation Letters (RA-L)*, 3(3):1949–1956, 2018.

[17] Athanasios C. Dometios, You Zhou, Xanthi S. Papageorgiou, Costas S. Tzafestas, and Tamim Asfour. Vision-Based Online Adaptation of Motion Primitives to Dynamic Surfaces: Application to an Interactive Robotic Wiping Task. *IEEE Robotics and Automation Letters (RA-L)*, 3(3):1410–1417, 2018.

[18] Júlia Borràs, Christian Mandery, and Tamim Asfour. A whole-body support pose taxonomy for multi-contact humanoid robot motions. *Science Robotics*, 2(13), 2017. http://robotics.sciencemag.org/content/2/13/eaaq0560.

[19] Eren Erdal Aksoy, Ekaterina Ovchinnikova, Adil Orhan, Yezhou Yang, and Tamim Asfour. Unsupervised linking of visual features to textual descriptions in long manipulation activities. *IEEE Robotics and Automation Letters (RA-L)*, 2(3):1397–1404, July 2017.

[20] Mirko Wächter, Simon Ottenhaus, Manfred Kröhnert, Nikolaus Vahrenkamp, and Tamim Asfour. The ArmarX Statechart Concept: Graphical Programming of Robot Behaviour. *Frontiers in Robotics and AI*, 3:33, 2016.

[21] Matthias Plappert, Christian Mandery, and Tamim Asfour. The KIT motion-language dataset. *Big Data*, 4(4):236–252, December 2016. available online at http://online.liebertpub.com/doi/full/10.1089/big.2016.0028.

[22] Christian Mandery, Ömer Terlemez, Martin Do, Nikolaus Vahrenkamp, and Tamim Asfour. Unifying representations and large-scale whole-body motion databases for studying human motion. *IEEE Transactions on Robotics*, 32(4):796–809, August 2016.

[23] Andej Gams, Tadej Petric, Martin Do, Bojan Nemec, Jun Morimoto, Tamim Asfour, and Ales Ude. Adaptation and coaching of periodic motion primitives through

physical and visual interaction. *Robotics and Autonomous Systems*, 75, Part B:340–351, January 2016.

[24] Felix Von Drigalski, Atsutoshi Ikeda, Tsukasa Ogasawara, and Tamim Asfour. A measurement setup for the 3d validation of fingertip deformation models. *International Journal of Human Factors Modelling and Simulation*, 5(3):230–237, January 2016.

[25] Florentin Wörgötter, Chris Geib, Minija Tamosiunaite, Eren Erdal Aksoy, Justus Piater, Hanchen Xiong, Ales Ude, Bojan Nemec, Dirk Kraft, Norbert Krüger, Mirko Wächter, , and Tamim Asfour. Structural bootstrapping - a novel concept for the fast acquisition of action-knowledge. *IEEE Transactions on Autonomous Mental Development*, 7(2):140–154, June 2015.

[26] Nikolaus Vahrenkamp and Tamim Asfour. Representing the robot's workspace through constrained manipulability analysis. *Autonomous Robots*, 38(1):17–30, 2015.

[27] N. Vahrenkamp, M. Wächter, M. Kröhnert, K. Welke, and T. Asfour. The Robot Software Framework ArmarX. *Information Technology*, 57(2):99–111, 2015.

[28] Gabriele Trovato, Massimiliano Zecca, Martin Do, Ömer Terlemez, Masuko Kuramochi, Alexander Waibel, Tamim Asfour, and Atsuo Takanishi. A Novel Greeting Selection System for a Culture-Adaptive Humanoid Robot. *International Journal of Advanced Robotic Systems*, 12(34):34, April 2015.

[29] Wataru Takano, Tamim Asfour, and Petar Kormushev. Special issue on humanoid robotics. *Advanced Robotics*, 29(5), March 2015.

[30] Johny Paul, Walter Stechele, Benjamin Oechslein, Christoph Erhardt, Jens Schedel, Daniel Lohmann, Wolfgang Schröder-Preikschat, Manfred Kröhnert, Tamim Asfour, Ericles Sousa, Vahid Lari, Frank Hannig, Jürgen Teich, Artjom Grudnitsky, Lars Bauer, and Jörg Henkel. Resource-awareness on heterogeneous MPSoCs for image processing. *Journal of Systems Architecture*, 61(10):668–680, 2015.

[31] Johny Paul, Benjamin Oechslein, Christoph Erhardt, Jens Schedel, Manfred Kröhnert, Daniel Lohmann, Walter Stechele, Tamim Asfour, and Wolfgang Schröder-Preikschat. Self-adaptive corner detection on MPSoC through resource-aware programming. *Journal of Systems Architecture*, 61(10):520–530, 2015.

[32] Peter Kaiser, Nikolaus Vahrenkamp, Fabian Schültje, Júlia Borràs, and Tamim Asfour. Extraction of whole-body affordances for loco-manipulation tasks. *International Journal of Humanoid Robotics (IJHR)*, 12(3):15–31, 2015.

[33] Carlos Balaguer, Tamim Asfour, Giorgio Metta, and Kazuhito Yokoi. Special issue on 2014 ieee-ras international conference on humanoid robots – humans and humanoids face to facehumans and humanoids face to face. *International Journal of Humanoid Robotics (IJHR)*, 3(12), May 2015. (Special Issue).

[34] Johny Paul, Walter Stechele, Manfred Kröhnert, and Tamim Asfour. Resource-aware programming for robotic vision. *CoRR*, abs/1405.2908, 2014.

[35] Alexander Herzog, Peter Pastor, Mrinal Kalakrishnan, Ludovic Righetti, Jeanette Bohg, Tamim Asfour, and Stefan Schaal. Learning of grasp selection based on shape-templates. *Autonomous Robots*, 36(1-2):51–65, 2014.

[36] Jeannette Bohg, Antonio Morales, Tamim Asfour, and Danica Kragic. Data-driven grasp synthesis – a survey. *IEEE Transactions on Robotics*, 30(2):289–309, 2014.

[37] D. Schiebener, J. Morimoto, T. Asfour, and A. Ude. Integrating visual perception and manipulation for autonomous learning of object representations. *Adaptive Behavior*, 21(5):328–345, 2013.

[38] Tamim Asfour, Nikolaus Vahrenkamp, David Schiebener, Martin Do, Markus Przybylski, Kai Welke, Julian Schill, and Rüdiger Dillmann. Armar-iii: Advances in humanoid grasping and manipulation. *Journal of the Robotics Society of Japan*, 31(4):341–346, 2013.

[39] Nikolaus Vahrenkamp, Tamim Asfour, and Rüdiger Dillmann. Efficient inverse kinematics computation based on reachability analysis. *International Journal of Humanoid Robotics (IJHR)*, 9(4), 2012.

[40] N. Vahrenkamp, T. Asfour, and R. Dillmann. Simultaneous grasp and motion planning. *IEEE Robotics and Automation Magazine*, 19(2):43–57, 2012.

[41] S. Ulbrich, V. Ruiz, T. Asfour, C. Torras, and R. Dillmann. Kinematic bézier maps. *IEEE Transactions on Systems, Man, and Cybernetics*, 42(4):1215–1230, 2012.

[42] S. Ulbrich, V. Ruiz, T. Asfour, C. Torras, and R. Dillmann. General kinematics decomposition without intermediate markers. *IEEE Transactions on Neural Networks and Learning Systems*, 23(4):620–630, 2012.

[43] Daniel Kappler, Lillian Y. Chang, Nancy S. Pollard, Tamim Asfour, and Rüdiger Dillmann. Templates for pre-grasp sliding interactions. *Robotics and Autonomous Systems*, 60(3):411–423, 2012.

[44] Christian Böge, Nikolaus Vahrenkamp, Tamim Asfour, and Rüdiger Dillmann. Visual servoing for single and dual arm manipulation tasks in humanoid robots. *at - Automatisierungstechnik*, 60(5):309–317, May 2012.

[45] Norbert Krüger, Christopher Geib, Justus Piater, Ronald Petrick, Mark Steedman, Florentin Wörgötter, Aleš Ude, Tamim Asfour, Dirk Kraft, Damir Omrčen, Alejandro Agostini, and Rüdiger Dillmann. Object-action complexes: Grounded abstractions of sensorimotor processes. *Robotics and Autonomous Systems*, 59:740–757, 2011.

[46] Robert P. Goldman, Christopher W. Geib, Henry Kautz, and Tamim Asfour. Plan Recognition (Dagstuhl Seminar 11141). *Dagstuhl Reports*, 1(4):1–22, 2011.

[47] Andreas Fischer, Martin Do, Thorsten Stein, Tamim Asfour, Rüdiger Dillmann, and Hermann Schwameder. Recognition of individual kinematic patterns during walking and running - a comparison of artificial neural networks and support vector machines. *Int. J. Comp. Sci. Sport*, 10(1):63–67, 2011.

[48] Tamim Asfour, Martin Do, Kai Welke, Alexander Bierbaum, Pedram Azad, Nikolaus Vahrenkamp, Stefan Gärtner, Ales Ude, and Rüdiger Dillmann. From sensorimotor

primitives to manipulation and imitation strategies in humanoid robots. *Robotics Research, Springer Tracts in Advanced Robotics*, 70(STAR):363–378, 2011.

[49] Tino Werner, Artem Kargov, Immanuel Gaiser, Alexander Bierbaum, Julian Schill, Stefan Schulz, and Georg Bretthauer. A fluidic driven anthropomorphic robotic hand. *at - Automatisierungstechnik*, 58(12):681–687, 2010.

[50] A. Ude, A. Gams, T. Asfour, and J. Morimoto. Task-specific generalization of discrete and periodic dynamic movement primitives. *IEEE Transactions on Robotics*, 26(5):800 – 815, October 2010.

[51] Mila Popović, Dirk Kraft, Leon Bodenhagen, Emre Başeski, Nicolas Pugeault, Danica Kragic, Tamim Asfour, and Norbert Krüger. A strategy for grasping unknown objects based on co-planarity and colour information. *Robotics and Autonomous Systems*, 58(5):551–565, May 2010.

[52] David Gonzalez-Aguirre, Tamim Asfour, and Rüdiger Dillmann. Towards stratified model-based environmental visual perception for humanoid robots. *Pattern Recognition Letters, Special Issue on Advances in Theory and Applications of Pattern Recognition, Image Processing and Computer Vision.*, Volume 32, Issue 16, Available online 13 October 2010:2254–2260, 2010.

[53] Rüdiger Dillmann, Tamim Asfour, Martin Do, Rainer Jäkel, Alexander Kasper, Pedram Azad, Aleš Ude, Sven Schmidt-Rohr, and Martin Lösch. Advances in robot programming by demonstration. *KI - Künstliche Intelligenz*, 24(4):295–303, 2010.

[54] M. Tamosiunaite, T. Asfour, and F. Wörgötter. Learning to reach by reinforcement learning using a receptive field based function approximation approach with continuous actions. *Biological Cybernetics*, 100:249–260, 2009.

[55] Rüdiger Dillmann, Tamim Asfour, Gordon Cheng, and Ales Ude. Toward cognitive humanoid robots. *International Journal of Humanoid Robotics (IJHR)*, 5(2):2, June 2008. (Special Issue).

[56] Rüdiger Dillmann and Tamim Asfour. Collaborative research center on humanoid robots (sfb 588). *KI - Zeitschrift Künstliche Intelligenz*, 4:26–28, 2008.

[57] Tamim Asfour, Kai Welke, Ales Ude, Pedram Azad, and Rüdiger Dillmann. Perceiving Objects and Movements to Generate Actions on a Humanoid Robot. *Lecture Notes in Electrical Engineering*, 8:41–55, July 2008.

[58] Tamim Asfour, Pedram Azad, Nikolaus Vahrenkamp, Kristian Regenstein, Alexander Bierbaum, Kai Welke, Joachim Schröder, and Rüdiger Dillmann. Toward Humanoid Manipulation in Human-Centred Environments. *Robotics and Autonomous Systems*, 56:54–65, January 2008.

[59] Tamim Asfour, Pedram Azad, Florian Gyarfas, and Rüdiger Dillmann. Imitation Learning of Dual-Arm Manipulation Tasks in Humanoid Robots. *International Journal of Humanoid Robotics (IJHR)*, 5(2):183–202, December 2008.

[60] Rüdiger Dillmann, Peter Steinhaus, Tamim Asfour, and Michael Pardowitz. Lernende humanoide roboter in alltagsumgebungen. *it – Information Technology*, 49(4):224–231, 2007.

Peer-Reviewed Conferences

[61] Julian Zimmer, Tess Hellebrekers, Tamim Asfour, Carmel Majidi, and Oliver Kroemer. Predicting grasp success with a soft sensing skin and shape-memory actuated gripper. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Macau, China, November 2019. IEEE.

[62] You Zhou, Jianfeng Gao, and Tamim Asfour. Learning via-point movement primitives with inter- and extrapolation capabilities. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Macau, China, November 2019.

[63] Julia Starke, Konstantinos Chatzilygeroudis, Aude Billard, and Tamim Asfour. On force synergies in human grasping behavior. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 72–78, Toronto, Canada, October 2019.

[64] Dmitriy Shingarey, Lukas Kaul, and Tamim Asfour. Torque-based velocity control for safe human-humanoid interaction. In *28th International Conference on Robotics in Alpe-Adria-Danube Region (RAAD)*, pages 61–68, 2019.

[65] Jonas Rothfuss, Dennis Lee, Ignasi Clavera, Tamim Asfour, and Pieter Abbeel. ProMP: Proximal Meta-Policy Search. In *International Conference on Learning Representations (ICLR)*, 2019.

[66] Janko Petereit, Jürgen Beyerer, Tamim Asfour, Sascha Gentes, Björn Hein, Uwe D. Hanebeck, Frank Kirchner, Rüdiger Dillmann, Hans Heinrich Götting, Martin Weiser, Michael Gustmann, and Thomas Egloffstein. Robdekon: Robotic systems for decontamination in hazardous environments. In *IEEE International Symposium on Safety, Security and Rescue Robotics*, Würzburg, Germany, September 2019. IEEE.

[67] Isabel Patzer and Tamim Asfour. Minimal sensor setup in lower limb exoskeletons for motion classification based on multi-modal sensor data. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pages 8158–8164, Macau, China, November 2019. IEEE.

[68] Simon Ottenhaus, Daniel Renninghoff, Raphael Grimm, Fabio Ferreira, and Tamim Asfour. Visuo-haptic grasping of unknown objects based on gaussian process implicit surfaces and deep learning. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 426–432, Toronto, Canada, October 2019.

[69] Felix Hundhausen, Denis Megerle, and Tamim Asfour. Resource-aware object classification and segmentation for semi-autonomous grasping with prosthetic hands. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, Toronto, Canada, October 2019.

[70] Kevin Hitzler, Franziska Meier, Stefan Schaal, and Tamim Asfour. Learning and adaptation of inverse dynamics models: A comparison. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, Toronto, Canada, October 2019.

[71] Markus Grotz, David Sippel, and Tamim Asfour. Active vision for extraction of physically plausible support relations. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 463–469, Toronto, Canada, October 2019.

[72] Fabio Ferreira, Lin Shao, Tamim Asfour, and Jeannette Bohg. Learning visual dynamics models of rigid objects using relational inductive biases. In *NeurIPS 2019 Graph Representation Learning Workshop*, Vancouver, Canada, 2019.

[73] Miha Dezman, Tamim Asfour, Ales Ude, and Andrej Gams. Exoskeleton arm pronation/supination assistance mechanism with a guided double rod system. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, Toronto, Canada, October 2019.

[74] Tilman Daab, Isabel Patzer, Ralf Mikut, and Tamim Asfour. Feature space exploration for motion classification based on multi-modal sensor data for lower limb exoskeletons. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 667–674, Toronto, Canada, October 2019.

[75] Tobias Boltz, Tamim Asfour, Miriam Brosi, Erik Bründermann, Bastian Härer, Peter Kaiser, Anke-Susanne Müller, Christoph Pohl, Patrick Schreiber, and Minjie Yan. Feedback design for control of the micro-bunching instability based on reinforcement learning. In *Proc. 10th International Particle Accelerator Conference (IPAC)*, Melbourne, Australia, May 2019.

[76] Tim Welschehold, Christian Dornhege, Fabian Paus, Tamim Asfour, and Wolfram Burgard. Coupling mobile base and end-effector motion in task space. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2018.

[77] Pascal Weiner, Julia Starke, Felix Hundhausen, Jonas Beil, and Tamim Asfour. The kit prosthetic hand: Design and control. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pages 3328–3334, Madrid, Spain, October 2018.

[78] Pascal Weiner, Caterina Neef, and Tamim Asfour. A multimodal embedded sensor system for scalable robotic and prosthetic fingers. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 286–292, Beijing, China, November 2018.

[79] Julia Starke, Christian Eichmann, Simon Ottenhaus, and Tamim Asfour. Synergy-based, data-driven generation of object-specific grasps for anthropomorphic hands. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 327–333, Beijing, China, November 2018.

[80] Philipp Schmidt, Nikolaus Vahrenkamp, Mirko Wächter, and Tamim Asfour. Grasping of Unknown Objects using Deep Convolutional Neural Networks based on Depth Images. In *IEEE International Conference on Robotics and Automation (ICRA)*, pages 6831–6838, Brisbane, Australia, May 2018.

[81] Matthias Plappert, Rein Houthooft, Prafulla Dhariwal, Szymon Sidor, Richard Y. Chen, Xi Chen, Tamim Asfour, Pieter Abbeel, and Marcin Andrychowicz. Parameter space noise for exploration. In *International Conference on Learning Representations*, pages 1–18, 2018.

[82] Fabian Peller, Mirko Wächter, Markus Grotz, Peter Kaiser, and Tamim Asfour. Temporal concurrent planning with stressed actions. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 901–908, 2018.

[83] Johannes Pankert, Lukas Kaul, and Tamim Asfour. Learning efficient omni-directional capture stepping for humanoid robots from human motion and simulation data. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 503–509, 2018.

[84] Simon Ottenhaus, Pascal Weiner, Lukas Kaul, Andreea Tulbure, and Tamim Asfour. Exploration and reconstruction of unknown objects using a novel normal and contact sensor. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pages 1614–1620, 2018.

[85] Daniel Krauß, Philipp Andelfinger, Fabian Paus, Nikolaus Vahrenkamp, and Tamim Asfour. Evaluating and optimizing component-based robot architectures using network simulation. In *Winter Simulation Conference*, Gothenburg, Sweden, December 2018.

[86] Oliver Karrenbauer, Samuel Rader, and Tamim Asfour. An Ontology-Based Expert System to Support the Design of Humanoid Robot Components. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 532–539, Beijing, China, 2018.

[87] Peter Kaiser, Christian Mandery, Andreas Boltres, and Tamim Asfour. Affordance-based multi-contact whole-body pose sequence planning for humanoid robots in unknown environments. In *IEEE International Conference on Robotics and Automation (ICRA)*, pages 3114–3121, Brisbane, Australia, 2018.

[88] Peter Kaiser, Markus Grotz, Fabian Paus, and Tamim Asfour. Towards the formalization of affordances as dempster-shafer belief functions. In *1st International Workshop on Computational Models of Affordance in Robotics, Robotics Science and Systems (RSS)*, Pittsburgh, USA, 2018.

[89] Raffael Grimm, Abderrahmane Kheddar, and Tamim Asfour. Generation of walking motions based on whole-body poses and qp control. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 510–515, Beijing, China, 2018.

[90] Jianfeng Gao, You Zhou, and Tamim Asfour. Projected force-admittance control for compliant bimanual tasks. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 607–613, Beijing, China, November 2018.

[91] Ignasi Clavera, Jonas Rothfuss, John Schulman, Yasuhiro Fujita, Tamim Asfour, and Pieter Abbeel. Model-based reinforcement learning via meta-policy optimization. In *International Conference on Robot Learning (CoRL)*, Zurich, Switzerland, 2018.

[92] Júlia Borràs, Raphael Heudorfer, Samuel Rader, Peter Kaiser, and Tamim Asfour. The kit swiss knife gripper for disassembly tasks: A multi-functional gripper for bimanual manipulation with a single arm. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pages 4590–4597, Madrid, Spain, 2018.

[93] Jonas Beil, Isabel Ehrenberger, Clara Scherer, Christian Mandery, and Tamim Asfour. Human motion classification based on multi-modal sensor data for lower

limb exoskeletons. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2018.

[94] Jonas Beil and Tamim Asfour. A Rolling Contact Joint Lower Extremity Exoskeleton Knee. In *International Conference on Intelligent Autonomous Systems (IAS)*, Baden Baden, June 2018.

[95] Simon Bäuerle, Lukas Kaul, and Tamim Asfour. Linear contact modeling and stochastic parameter optimization for lqr-based whole-body push recovery. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 224–231, 2018.

[96] Tamim Asfour, Lukas Kaul, Mirko Wächter, Simon Ottenhaus, Pascal Weiner, Samuel Rader, Raphael Grimm, You Zhou, Markus Grotz, Fabian Paus, Dmitriy Shingarey, and Hans Haubert. Armar-6: A collaborative humanoid robot for industrial environments. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 447–454, 2018.

[97] Qingxiaoyang Zhu, Vittorio Perera, Mirko Wächter, Tamim Asfour, and Manuela Veloso. Autonomous narration of humanoid robot kitchen task experience. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 390–397, Birmingham, United Kingdom, 2017.

[98] You Zhou and Tamim Asfour. Task-oriented generalization of dynamic movement primitive. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Vancouver, Canada, September 2017.

[99] F. von Drigalski, M. Gall, S. Cho, M. Ding, J. Takamatsu, T. Ogasawara, and T. Asfour. Textile identification using fingertip motion and 3d force sensors in an open-source gripper. In *2017 IEEE International Conference on Robotics and Biomimetics (ROBIO)*, pages 424–429, 2017.

[100] Laura Steffan, Lukas Kaul, and Tamim Asfour. Online stability estimation based on inertial sensor data for humanand humanoid fall prevention. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 171–177, Birmingham, United Kingdom, 2017.

[101] Samuel Rader, Lukas Kaul, Pascal Weiner, and Tamim Asfour. Highly Integrated Sensor-Actuator-Controller Units for Modular Robot Design. In *IEEE International Conference on Advanced Intelligent Mechatronics (AIM)*, pages 1160–1166, Munich, Germany, 2017.

[102] Fabian Paus, Peter Kaiser, Nikolaus Vahrenkamp, and Tamim Asfour. A combined approach for robot placement and coverage path planning for mobile manipulation. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pages 6285–6292, Vancouver, Canada, September 2017.

[103] Timothée Habra, Markus Grotz, David Sippel, Tamim Asfour, and Renaud Ronsse. Multimodal gaze stabilization of a humanoid robot based on reafferences. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 47–54, Birmingham, UK, 2017.

[104] Markus Grotz, Peter Kaiser, Eren Erdal Aksoy, Fabian Paus, and Tamim Asfour. Graph-based visual semantic perception for humanoid robots. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 869–875, Birmingham, UK, 2017.

[105] Markus Grotz, Timothée Habra, Renaud Ronsse, and Tamim Asfour. Autonomous view selection and gaze stabilization for humanoid robots. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pages 1427–1434, Vancouver, Canada, 2017.

[106] Christian R. G. Dreher, Nicklas Kulp, Christian Mandery, Mirko Wächter, and Tamim Asfour. A framework for evaluating motion segmentation algorithms. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 83–90, Birmingham, United Kingdom, November 2017.

[107] J. Beil, C. Marquardt, and T. Asfour. Self-Aligning Exoskeleton Hip Joint: Kinematic Design With Five Revolute, Three Prismatic and One Ball Joint. In *2017 International Conference on Rehabilitation Robotics (ICORR)*, pages 1349–1355, July 2017.

[108] You Zhou, Martin Do, and Tamim Asfour. Learning and force adaptation for interactive actions. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, page 1129–1134, Cancún, Mexico, 2016.

[109] You Zhou, Martin Do, and Tamim Asfour. Coordinate change dynamic movement primitives - a leader-follower approach. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, page 5481–5488, Daejeon, Korea, October 2016.

[110] Nikolaus Vahrenkamp, Leonard Westkamp, Natsuki Yamanobe, Eren E. Aksoy, and Tamim Asfour. Part-based Grasp Planning for Familiar Objects. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 919–925, Cancun, Mexico, Nov 2016.

[111] Nikolaus Vahrenkamp, Harry Arnst, Mirko Wächter, David Schiebener, Panagiotis Sotiropoulos, Michal Kowalik, and Tamim Asfour. Workspace Analysis for Planning Human-Robot Interaction Tasks. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 1298–1303, Cancun, Mexico, Nov 2016.

[112] Gabriele Trovato, Martin Do, Ömer Terlemez, Christian Mandery, Hiroyuki Ishii, Nadia Bianchi-Berthouze, Tamim Asfour, and Atsuo Takanishi. Is hugging a robot weird? investigating the influence of robot appearance on users' perception of hugging. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 318–323, Cancún, Mexico, November 2016.

[113] Jannik Steinbring, Christian Mandery, Florian Pfaff, Florian Faion, Tamim Asfour, and Uwe D. Hanebeck. Real-time whole-body human motion tracking based on unlabeled markers. In *IEEE International Conference on Multisensor Fusion and Integration for Intelligent Systems (MFI)*, pages 583–590, Baden-Baden, Germany, September 2016.

[114] David Schiebener, Andreas Schmidt, Nikolaus Vahrenkamp, and Tamim Asfour. Heuristic 3d object shape completion based on symmetry and scene context. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pages 74–81, October 2016.

[115] Samuel Rader, Lukas Kaul, Hennes Fischbach, Nikolaus Vahrenkamp, and Tamim Asfour. Design of a High-Performance Humanoid Dual Arm System with Inner Shoulder Joints. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 523–529, Cancún, Mexico, 2016.

[116] Simon Ottenhaus, Martin Miller, David Schiebener, Nikolaus Vahrenkamp, and Tamim Asfour. Local implicit surface estimation for haptic exploration. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 850–856, Cancún, Mexico, 2016.

[117] Wael Mustafa, Mirko Wächter, Szedmak, Sandor, Agostini, Alejandro, Kraft, Dirk, Asfour, Tamim, Piater, Justus, Wörgötter, Florentin, and Krüger, Norbert. Affordance Estimation For Vision-Based Object Replacement on a Humanoid Robot. In *International Symposium on Robotics (ISR)*, volume 47, pages 1–9, Munich, Germany, 2016.

[118] Michail Maniadakis, Eren Erdal Aksoy, Tamim Asfour, and Panos Trahanias. Collaboration of heterogeneous agents in time constrained tasks. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 448–453. IEEE, 2016.

[119] Christian Mandery, Matthias Plappert, Júlia Borràs, and Tamim Asfour. Dimensionality reduction for whole-body human motion recognition. In *19th International Conference on Information Fusion (FUSION)*, pages 355–362, Heidelberg, Germany, July 2016.

[120] Christian Mandery, Júlia Borràs, Mirjam Jöchner, and Tamim Asfour. Using language models to generate whole-body multi-contact motions. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pages 5411–5418, Daejeon, Korea, October 2016.

[121] M. Kröhnert, R. Grimm, N. Vahrenkamp, and T. Asfour. Resource-Aware Motion Planning. In *IEEE International Conference on Robotics and Automation (ICRA)*, pages 32–39, May 2016.

[122] Lukas Kaul, Simon Ottenhaus, Pascal Weiner, and Tamim Asfour. The Sense of Surface Orientation - A New Sensor Modality for Humanoid Robots. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 820–825, Cancún, Mexico, 2016.

[123] Lukas Kaul and Tamim Asfour. Human push-recovery: Strategy selection based on push intensity estimation. In *International Symposium on Robotics (ISR)*, number 47, pages 547–554, Munich, Germany, 2016.

[124] Peter Kaiser, Dimitrios Kanoulas, Markus Grotz, Luca Muratore, Alessio Rocchi, Enrico Mingo Hoffman, Nikos G. Tsagarakis, and Tamim Asfour. An affordance-based pilot interface for high-level control of humanoid robots in supervised autonomy.

In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 621–628, Cancún, Mexico, 2016.

[125] Peter Kaiser, Eren E. Aksoy, Markus Grotz, Dimitrios Kanoulas, Nikos G. Tsagarakis, and Tamim Asfour. Experimental evaluation of a perceptual pipeline for hierarchical affordance extraction. In *International Symposium on Experimental Robotics (ISER)*, pages 136–146, Tokyo, Japan, 2016.

[126] Peter Kaiser, Eren E. Aksoy, Markus Grotz, and Tamim Asfour. Towards a hierarchy of loco-manipulation affordances. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pages 2839–2846, Deajeon, Korea, 2016.

[127] Cornelius Goldbeck, Lukas Kaul, Nikolaus Vahrenkamp, Florentin Wörgötter, Jan-Matthias Braun, and Tamim Asfour. Two Ways of Walking: Contrasting a Reflexive Neuro-Controller and a LIP-Based ZMP-Controller on the Humanoid Robot ARMAR-4. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 966–972, Cancún, Mexico, 2016.

[128] Jonas Beil and Tamim Asfour. New Mechanism for a 3 DOF Exoskeleton Hip Joint with Five Revolute and Two Prismatic Joints. In *6th IEEE International Conference on Biomedical Robotics and Biomechatronics (BioRob)*, pages 787–792, Singapore, June 2016.

[129] Eren Erdal Aksoy, You Zhou, Mirko Wächter, and Tamim Asfour. Enriched manipulation action semantics for robot execution of time constrained tasks. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 109–116, Cancún, Mexico, 2016. Best Oral Paper Award Finalist.

[130] Mikro Wächter, , and Tamim Asfour. Hierarchical Segmentation of Manipulation Actions based on Object Relations and Motion Characteristics. In *International Conference on Advanced Robotics (ICAR)*, pages 549–556, Istanbul, Turkey, July 2015. Best paper award candidate.

[131] Nikolaus Vahrenkamp, Dominik Muth, Peter Kaiser, and Tamim Asfour. IK-MAP: An Enhanced Workspace Representation to Support Inverse Kinematics Solvers. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 785–790, Seoul, Korea, Nov 2015.

[132] Ali Paikan, David Schiebener, Mirko Wächter, Tamim Asfour, Giorgio Metta, and Lorenzo Natale. Transferring object grasping knowledge and skill across different robotic platforms. In *International Conference on Advanced Robotics (ICAR)*, pages 498–503, Istanbul, Turkey, July 2015.

[133] Feng Ni, Daniel Rojas, Kai Tang, Lilong Cai, and Tamim Asfour. A Jumping Robot Using Soft Pneumatic Actuator. In *IEEE International Conference on Robotics and Automation (ICRA)*, pages 3154–3159, Seattle, USA, May 2015.

[134] Christian Mandery, Ömer Terlemez, Martin Do, Nikolaus Vahrenkamp, and Tamim Asfour. The KIT whole-body human motion database. In *International Conference on Advanced Robotics (ICAR)*, pages 329–336, Istanbul, Turkey, July 2015.

[135] Christian Mandery, Júlia Borràs, Mirjam Jöchner, and Tamim Asfour. Analyzing whole-body pose transitions in multi-contact motions. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 1020–1027, Seoul, Korea, November 2015.

[136] Jennifer King, Joshua A. Haustein, Siddhartha S. Srinivasa, , and Tamim Asfour. Nonprehensile Whole Arm Rearrangement Planning with Physics Manifolds. In *IEEE International Conference on Robotics and Automation (ICRA)*, pages 2508–2515, Seattle, USA, May 2015.

[137] Peter Kaiser, Markus Grotz, Eren E. Aksoy, Martin Do, Nikolaus Vahrenkamp, and Tamim Asfour. Validation of whole-body loco-manipulation affordances for pushability and liftability. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 920–927, Seoul, Korea, 2015.

[138] Joshua A. Haustein, Jennifer King, Siddhartha S. Srinivasa, , and Tamim Asfour. Kinodynamic Randomized Rearrangement Planning via Dynamic Transitions Between Statically Stable States. In *IEEE International Conference on Robotics and Automation (ICRA)*, pages 3075–3082, Seattle, USA, May 2015.

[139] Jan Oskar Brinker, Takamitsu Matsubara, Tatsuya Teramae, Tomoyuki Noda, Tsukasa Ogasawarsa, Tamim Asfour, and Jun Morimoto. Walking Pattern Prediction with Partial Observation for Partial Walking Assistance by using an Exoskeleton System. In *International Conference on Rehabilitation Robotics (ICORR)*, pages 139–144, Singapore, August 2015.

[140] Júlia Borràs and Tamim Asfour. A whole-body pose taxonomy for loco-manipulation tasks. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pages 1578–1585, Hamburg, Germany, October 2015.

[141] Jonas Beil, Gernot Perner, and Tamim Asfour. Design and Control of a Lower Limb Exoskeleton (KIT-EXO-1). In *International Conference on Rehabilitation Robotics (ICORR)*, pages 119–124, Singapore, August 2015.

[142] Tamim Asfour, Júlia Borràs, Christian Mandery, Peter Kaiser, Eren Erdal Aksoy, and Markus Grotz. On the dualities between grasping and whole-body loco-manipulation tasks. In *International Symposium on Robotics Research (ISRR)*, Springer Tracts in Advanced Robotics, pages 305–322. Springer, 2015.

[143] N. Vahrenkamp, M. Wächter, M. Kröhnert, P. Kaiser, K. Welke, and T. Asfour. High-Level Robot Control with ArmarX. In *INFORMATIK – Workshop on Robot Control Architectures*, Stuttgart, Germany, Sep 2014.

[144] G. Trovato, M. Do, M. Kuramochi, O. Terlemez, T. Asfour, and A. Takanishi. A novel culture-dependent gesture selection system for a humanoid robot performing greeting interaction. In *International Conference on Social Robotics (ICSR)*, pages 340–349, Sydney, Australia, 2014.

[145] Oemer Terlemez, Stefan Ulbrich, Christian Mandery, Martin Do, Nikolaus Vahrenkamp, and Tamim Asfour. Master motor map (mmm) - framework and toolkit for capturing, representing, and reproducing human motion on humanoid robots.

In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 894–901, Madrid, Spain, November 2014.

[146] S. Suwelack, C. Sander, J. Schill, Manuel Serf, M. Danz, T. Asfour, W. Burger, R. Dillmann, and S. Speidel. Towards open-source, low-cost haptics for surgery simulation. In *Medicine Meets Virtual Reality (MMVR)*, pages 401–403, Manhattan Beach, USA, February 2014.

[147] David Schiebener, Nikolaus Vahrenkamp, and Tamim Asfour. Visual collision detection for corrective movements during grasping on a humanoid robot. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 105–111, 2014.

[148] D. Schiebener, A. Ude, and T. Asfour. Physical interaction for segmentation of unknown textured and non-textured rigid objects. In *IEEE International Conference on Robotics and Automation (ICRA)*, pages 4959–4966, Hong Kong, 2014.

[149] Johny Paul, Walter Stechele, Ericles Sousa, Vahid Lari, Frank Hannig, Jürgen Teich, Manfred Kröhnert, and Tamim Asfour. Self-adaptive harris corner detector on heterogeneous many-core processor. In *Design and Architectures for Signal and Image Processing (DASIP), 2014 Conference on*, pages 1–8, Oct 2014.

[150] Johny Paul, Walter Stechele, Manfred Kröhnert, Tamim Asfour, Benjamin Oechslein, Christoph Erhardt, Jens Schedel, Daniel Lohmann, and Wolfgang Schröder-Preikschat. Resource-aware harris corner detection based on adaptive pruning. In *Proceedings of the Conference on Architecture of Computing Systems (ARCS)*, pages 1–12. Springer Lecture Notes in Computer Science (LNCS), 2014.

[151] Johny Paul, , Walter Stechele, Manfred Kroehnert, and Tamim Asfour. Improving efficiency of embedded multi-core platforms with scratchpad memories. In *Architecture of Computing Systems (ARCS), 2014 27th International Conference on*, pages 1–8, Feb 2014.

[152] Manfred Kröhnert, Nikolaus Vahrenkamp, Johny Paul, Walter Stechele, and Tamim Asfour. Resource prediction for humanoid robots. In *Proceedings of the First Workshop on Resource Awareness and Adaptivity in Multi-Core Computing (Racing 2014)*, pages 22–28, May 2014.

[153] Peter Kaiser, Mike Lewis, Ronald P. A. Petrick, Tamim Asfour, and Mark Steedman. Extracting common sense knowledge from text for robot planning. In *IEEE International Conference on Robotics and Automation (ICRA)*, pages 3749–3756, 2014.

[154] Peter Kaiser, David Gonzalez-Aguirre, Fabian Schültje, Júlia Borràs, Nikolaus Vahrenkamp, and Tamim Asfour. Extracting whole-body affordances from multimodal exploration. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 1036–1043, 2014.

[155] Boris Illing, Tamim Asfour, and Nancy S. Pollard. Changing pre-grasp strategies with increasing object location uncertainty. In *IEEE/RSJ International Conference on*

Intelligent Robots and Systems (IROS), pages 2468–2475, Chicago, USA, September 2014.

[156] D. Gonzalez-Aguirre, M. Vollert, T. Asfour, and R. Dillmann. Robust real-time 6d active-visual localization for humanoid robots. In *The IEEE international conference on robotics and automation, ICRA 2014, Hong Kong, China.*, pages 2785–2791, 2014.

[157] Javier Felip, Antonio Morales, and Tamim Asfour. Multi-sensor and prediction fusion for contact detection and localization. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 601–607, 2014.

[158] Felix Von Drigalski, Atsutoshi Ikeda, Tamim Asfour, and Tsukasa Ogasawara. A measurement setup for the 3d validation of fingertip deformation models. In *International Conference on Digital Human Modeling Symposium (DHM)*, pages 230–237, Tokyo, Japan, May 2014.

[159] M. Do, J. Schill, J. Ernesti, and T. Asfour. Learn to wipe: A case study of structural bootstrapping from sensorimotor experience. In *IEEE International Conference on Robotics and Automation (ICRA)*, pages 1858–1864, 2014.

[160] Katsu Yamane, Marcel Revfi, and Tamim Asfour. Synthesizing object receiving motions of humanoid robots with human motion database. In *IEEE International Conference on Robotics and Automation (ICRA)*, pages 1629–1636, 2013.

[161] Kai Welke, Nikolaus Vahrenkamp, Mirko Wächter, Manfred Kroehnert, and Tamim Asfour. The ArmarX Framework - Supporting high level robot programming through state disclosure. In *GI Annual German Conference on Informatics*, pages 2823–2837. GI, 2013.

[162] Kai Welke, Peter Kaiser, Alexey Kozlov, Nils Adermann, Tamim Asfour, Mike Lewis, and Mark Steedman. Grounded spatial symbols for task planning based on experience. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 484–491, Atlanta, USA, 2013.

[163] K. Welke, D. Schiebener, T. Asfour, and R. Dillmann. Gaze selection during manipulation tasks. In *IEEE International Conference on Robotics and Automation (ICRA)*, pages 652–659, Karlsruhe, Germany, 2013.

[164] M. Wächter, S. Schulz, T. Asfour, E. Aksoy, F. Wörgötter, and R. Dillmann. Action Sequence Reproduction based on Automatic Segmentation and Object-Action Complexes. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 189–195, Atlanta, USA, October 2013.

[165] N. Vahrenkamp, T. Asfour, and R. Dillmann. Robot placement based on reachability inversion. In *IEEE International Conference on Robotics and Automation (ICRA)*, pages 1970–1975, 2013.

[166] Stefan Ulbrich and Tamim Asfour. Improving body schema learning with kinematic bezier maps by symmetry constraints. In *ICRA Workshop on Autonomous Learning*, 2013.

[167] Éricles R. Sousa, Alexandru Tanase, Vahid Lari, Frank Hannig, Jürgen Teich, Johny Paul, Walter Stechele, Manfred Kröhnert, and Tamim Asfour. Acceleration of optical flow computations on tightly-coupled processor arrays. In *Proceedings of the 25th Workshop on Parallel Systems and Algorithms (PARS)*, volume 30 of *Mitteilungen – Gesellschaft für Informatik e. V., Parallel-Algorithmen und Rechnerstrukturen*. Gesellschaft für Informatik e.V., April 2013.

[168] Johny Paul, Walter Stechele, Manfred Kröhnert, Tamim Asfour, Benjamin Oechslein, Christoph Erhardt, Jens Schedel, Daniel Lohmann, and Wolfgang Schröder-Preikschat. A resource-aware nearest neighbor search algorithm for K-dimensional trees. In *Proceedings of the 2013 Conference on Design & Architectures for Signal & Image Processing (DASIP 2013)*, pages 80–87. IEEE Computer Society Press, 2013.

[169] Robert Katzschmann, Torsten Kröger, Tamim Asfour, and Oussama Khatib. Towards online trajectory generation considering robot dynamics and torque limits. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pages 5644–5651, Tokyo, Japan, 2013.

[170] D. Gonzalez-Aguirre, T. Asfour, and R. Dillmann. Optimal high-dynamic-range image acquisition for humanoid robots. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pages 2586–2593, Tokyo, Japan, 2013.

[171] A. Gams, B. Nemec, L. Zlajpah, M. Wächter, A. Ijspeert, T. Asfour, and A. Ude. Modulation of Motor Primitives using Force Feedback: Interaction with the Environment and Bimanual Tasks. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pages 5629–5635, Tokyo, Japan, 2013.

[172] Naoki Fukaya, Tamim Asfour, Rüdiger Dillmann, and Shigeki Toyama. Development of a five-finger dexterous hand without feedback control: The tuat/karlsruhe humanoid hand. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pages 4533–4540, Tokyo, Japan, 2013.

[173] Miha Deniša, Tadej Petrič, Tamim Asfour, and Aleš Ude. Synthesizing compliant reaching movements by searching a database of example trajectories. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 540–546, Atlanta, USA, 2013.

[174] Tamim Asfour, Julian Schill, Heiner Peters, Cornelius Klas, Jens Bücker, Christian Sander, Stefan Schulz, Artem Kargov, Tino Werner, and Volker Bartenbach. ARMAR-4: A 63 DOF Torque Controlled Humanoid Robot. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 390–396, Atlanta, USA, October 2013.

[175] Nikolaus Vahrenkamp, Manfred Kröhnert, Stefan Ulbrich, Tamim Asfour, Giorgio Metta, Rüdiger Dillmann, and Giulio Sandini. Simox: A robotics toolbox for simulation, motion and grasp planning. In *International Conference on Intelligent Autonomous Systems (IAS)*, pages 585–594., 2012.

[176] Nikolaus Vahrenkamp, Tamim Asfour, Giorgio Metta, Giulio Sandini, and Rüdiger Dillmann. Manipulability analysis. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 568–573, Osaka, Japan, 2012.

[177] S. Ulbrich, M. Bechtel, T. Asfour, and R. Dillmann. Learning robot dynamics with kinematic bézier maps. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2012.

[178] A. Ude, D. Schiebener, N. Sugimoto, and J. Morimoto. Integrating surface-based hypotheses and manipulation for autonomous segmentation and learning of object representations. In *IEEE International Conference on Robotics and Automation (ICRA)*, pages 1709 –1715, May 2012.

[179] J. Schill, J. Laaksonen, M. Przybylski, V. Kyrki, T. Asfour, and R. Dillmann. Learning continuous grasp stability for a humanoid robot hand based on tactile sensing. In *IEEE RAS EMBS International Conference on Biomedical Robotics and Biomechatronics (BioRob)*, pages 1901–1906, Rome, Italy, June 2012.

[180] D. Schiebener, J. Schill, and T. Asfour. Discovery, segmentation and reactive grasping of unknown objects. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 71–77, Osaka, Japan, November 2012.

[181] M. Przybylski, M. Wächter, T. Asfour, and R. Dillmann. A Skeleton-based Approach to Grasp Known Objects with a Humanoid Robot. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 376–383, 2012.

[182] Johny Paul, Walter Stechele, Manfred Kröhnert, Tamim Asfour, and Rüdiger Dillmann. Invasive Computing for Robotic Vision. In *Proceedings of the 17th Asia and South Pacific Design Automation Conference (ASP-DAC)*, pages 207–212, Sydney, Australia, January 2012.

[183] S. Navarro, N.Gorges, H. Wörn, J. Schill, T. Asfour, and R. Dillmann. Haptic object recognition for multi-fingered robot hands. In *IEEE Haptics Symposium*, pages 497–502, Vancouver, Canada, March 2012.

[184] Sébastien Lengagne, Oemer Terlemez, Sophie Laturnus, Tamim Asfour, and Ruediger Dillmann. Retrieving contact points without environment knowledge. In *IEEE-RAS International conference on Humanoid robots*, pages 841–846, 2012.

[185] Peter Kaiser, Dmitry Berenson, Nikolaus Vahrenkamp, Tamim Asfour, Rüdiger Dillmann, and Siddhartha Srinivasa. Constellation - an algorithm for finding robot configurations that satisfy multiple constraints. In *IEEE International Conference on Robotics and Automation (ICRA)*, pages 436–443, 2012.

[186] A. Herzog, P. Pastor, M. Kalakrishnan, L. Righetti, T. Asfour, and S. Schaal. Template-based learning of grasp selection. In *IEEE International Conference on Robotics and Automation (ICRA)*, pages 2379–2384, 2012.

[187] D. Gonzalez-Aguirre, T. Asfour, and R. Dillmann. Ground-truth uncertainty model of visual depth perception for humanoid robots. In *Humanoid Robots (Humanoids), 2010 10th IEEE-RAS International Conference on*, pages 436–442, 2012.

[188] J. Ernesti, L. Righetti, M. Do, T. Asfour, and S. Schaal. Encoding of periodic and their transient motions by a single dynamic movement primitive. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 57–64, Osaka, Japan, December 2012.

[189] J. Bohg, K. Welke, B. Leon, M. Do, D. Song, W. Wohlkinger, M. Madry, A. Aldoma, M. Przybylski, T. Asfour, H. Marti, D. Kragic, A. Morales, and M. Vincze. Task-based Grasp Adaptation on a Humanoid Robot. In *10th IFAC Symposium on Robot Control (SYROCO 2012)*, pages 779–786, 2012.

[190] K. Welke, T. Asfour, and R. Dillmann. Inhibition of return in the bayesian strategy to active visual search. In *IAPR Conference on Machine Vision Applications*, pages 79–83, 2011.

[191] N. Vahrenkamp, M. Przybylski, T. Asfour, and R. Dillmann. Bimanual Grasp Planning. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 493–499, Ljubljana, Slovenia, October 2011.

[192] N. Vahrenkamp, P. Kaiser, T. Asfour, and R. Dillmann. RDT+: A Parameter–free Algorithm for Exact Motion Planning. In *IEEE International Conference on Robotics and Automation (ICRA)*, pages 715–722, Shanghai, China, 2011.

[193] Stefan Ulbrich, Daniel Kappler, Tamim Asfour, Nikolaus Vahrenkamp, Alexander Bierbaum, Markus Przybylski, and Rüdiger Dillmann. The opengrasp benchmarking suite: An environment for the comparative analysis of grasping and dexterous manipulation. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pages 3598–3604, San Francisco, USA, September 2011.

[194] D. Schiebener, A. Ude, J. Morimoto, T. Asfour, and R. Dillmann. Segmentation and learning of unknown objects through physical interaction. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 500–506, Bled, Slovenia, October 2011.

[195] S. Roehl, S. Speidel, D. Gonzalez-Aguirre, S. Suwelack, H. Kenngott, T. Asfour, B. Mueller-Stich, and R. Dillmann. From Stereo Image Sequences to Smooth and Robust Surface Models using Temporal Information and Bilateral Postprocessing. In *IEEE International conference on Robotics and Biomimetics*, pages 544–550, 2011.

[196] M. Przybylski, R. Gilster, T. Asfour, H. Deubel, and R. Dillmann. Human-Inspired Selection of Grasp Hypotheses for Execution on a Humanoid Robot. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 643–649, Ljubljana, Slovenia, October 2011.

[197] M. Przybylski, T. Asfour, and R. Dillmann. Planning Grasps for Robotic Hands using a Novel Object Representation based on the Medial Axis Transform. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pages 1781–1788, 2011.

[198] A. Herzog, P. Pastor, M. Kalakrishnan, L. Righetti, T. Asfour, and S. Schaal. Template-Based Learning of Grasp Selection. In *Proceedings IROS-2011 Workshop "The PR2 Workshop -Results, Challenges and Lessons Learned in Advancing Robots with a Common Platform"*, San Francisco, USA, September 2011.

[199] D. Gonzalez-Aguirre, J. Hoch, S. Rohl, T. Asfour, E. Bayro-Corrochano, and R. Dillmann. Towards shape-based visual object categorization for humanoid robots. In

Robotics and Automation (ICRA), 2011 IEEE International Conference on, pages 5226–5232, may 2011.

[200] D. Gonzalez-Aguirre, T. Asfour, and R. Dillmann. Robust image acquisition for vision-model coupling by humanoid robots. pages 557–561, 2011.

[201] M. Do, T. Asfour, and R. Dillmann. Towards a Unifying Grasp Representation for Imitation Learning on Humanoid Robots. In *IEEE International Conference on Robotics and Automation (ICRA)*, pages 482–488, Shanghai, China, May 2011.

[202] M. Do, T. Asfour, and R. Dillmann. Particle Filter-Based Fingertip Tracking with Circular Hough Transform Features. In *IAPR Machine Vision Applications (MVA'11)*, Nara, Japan, June 2011.

[203] P. Azad, D. Münch, T. Asfour, and R. Dillmann. 6-DoF Model-based Tracking of Arbitrarily Shaped 3D Objects. In *IEEE International Conference on Robotics and Automation (ICRA)*, pages 5204–5209, Shanghai, China, 2011.

[204] T. Asfour. Towards High-Performance 24/7 Cognitive Humanoids. In *Berlin Summit on Robotics*, pages 53–61, Berlin, Germany, July 2011.

[205] Kai Welke, Jan Issac, David Schiebener, Tamim Asfour, and Rüdiger Dillmann. Autonomous acquisition of visual multi-view object representations for object recognition on a humanoid robot. In *IEEE International Conference on Robotics and Automation (ICRA)*, pages 2012–2019, 2010.

[206] N. Vahrenkamp, E. Kuhn, T. Asfour, and R. Dillmann. Planning Multi-Robot Grasping Motions. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 593–600, Nashville, USA, December 2010.

[207] N. Vahrenkamp, M. Do, T. Asfour, and R. Dillmann. Integrated Grasp and Motion Planning. In *IEEE International Conference on Robotics and Automation (ICRA)*, pages 2883–2888, Anchorage, USA, Mai 2010.

[208] M. Przybylski, T. Asfour, and R. Dillmann. Unions of Balls for Shape Approximation in Robot Grasping. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pages 1592–1599, 2010.

[209] B. Leon, S. Ulbrich, R. Diankov, G. Puche, M. Przybylski, A. Morales, T. Asfour, S. Moisio, J. Bohg, J. Kuffner, and R. Dillmann. Opengrasp: A toolkit for robot grasping simulation. In *2nd International Conference on Simulation, Modeling, and Programming for Autonomous Robots (SIMPAR)*, pages 109–120, Darmstadt, Germany, November 15-18 2010. Best Paper Award.

[210] Norbert Krüger, Nicolas Pugeault, Emre Baseski, Lars Baunegaard With Jensen, Sinan Kalkan, Dirk Kraft, Jeppe Barsøe Jessen, Florian Pilz, Anders Kjær-Nielsen, Mila Popovic, Tamim Asfour, Justus Piater, Danica Kragic, and Florentin Wörgötter. Early cognitive vision as a frontend for cognitive systems. In *ECCV 2010 Workshop on Vision for Cognitive Tasks*, Heraklion, Crete, Greece, 2010.

[211] F. Kraft, K. Kilgour, R. Saam, S. Sẗucker, M. Ẅolfel, T. Asfour, and A. Waibel. Towards Social Integration of Humanoid Robots by Conversational Concept Learning.

In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 352–357, Nashville, USA, December 2010.

[212] D. Kappler, L. Chang, M. Przybylski, N.S. Pollard, T. Asfour, and R. Dillmann. Representation of Pre-Grasp Strategies for Object Manipulation. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 617–624, Nashville, USA, December 2010.

[213] D. Gonzalez-Aguirre, T. Asfour, and R. Dillmann. Eccentricity edge-graphs from hdr images for object recognition by humanoid robots. In *Humanoid Robots (Humanoids), 2010 10th IEEE-RAS International Conference on*, pages 144–151, Nashville, USA, December 2010.

[214] S. Gärtner, M. Do, C. Simonidis, T. Asfour, W. Seemann, and R. Dillmann. Generation of Human-like Motion for Humanoid Robots Based on Marker-based Motion Capture Data. In *41th International Symposium on Robotics (ISR)*, pages 1–8, 2010.

[215] A. Gams, M. Do, A. Ude, T. Asfour, and R. Dillmann. On-Line Periodic Movement and Force-Profile Learning for Adaptation to New Surfaces. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 560–565, Nashville, USA, December 2010.

[216] S. Wieland, D. Gonzalez-Aguirre, N. Vahrenkamp, T. Asfour, and R. Dillmann. Combining force and visual feedback for physical interaction tasks in humanoid robots. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 439–446, Paris, France, 2009.

[217] K. Welke, T. Asfour, and R. Dillmann. Bayesian visual feature integration with saccadic eye movements. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 256–262, Paris, France, 2009.

[218] K. Welke, T. Asfour, and R. Dillmann. Active multi-view object search on a humanoid head. In *IEEE International Conference on Robotics and Automation (ICRA)*, pages 417–423, Kobe, Japan, May 2009.

[219] N. Vahrenkamp, C. Böge, K. Welke, T. Asfour, J. Walter, and R. Dillmann. Visual Servoing for Dual Arm Motions on a Humanoid Robot. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 208–214, Paris, France, Dec. 2009.

[220] N. Vahrenkamp, D. Berenson, T. Asfour, J. Kuffner, and R. Dillmann. Humanoid Motion Planning for Dual-Arm Manipulation and Re-Grasping Tasks. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pages 2464–2470, St. Louis, USA, October 2009.

[221] N. Vahrenkamp, A. Barski, T. Asfour, and R. Dillmann. Planning and Execution of Grasping Motions on a Humanoid Robot. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 639–645, Paris, France, Dec. 2009.

[222] S. Ulbrich, V. Ruiz, T. Asfour, C. Torras, and R. Dillmann. Rapid learning of humanoid body schemas with kinematic bezier maps. In *IEEE/RAS International*

Conference on Humanoid Robots (Humanoids), pages 431–438, Paris, France, Dec. 2009.

[223] S. Speidel, J. Benzko, G. Sudra, P. Azad, B. P. Müller-Stich, C. N. Gutt, and R. Dillmann. Automatic Classification of Minimally Invasive Instruments based on Endoscopic Image Sequences. In *SPIE Medical Imaging*, volume 7261, Lake Buena Vista, USA, February 2009.

[224] Peter Pastor, Heiko Hoffmann, T. Asfour, and Stefan Schaal. Learning and generalization of motor skills by learning from demonstration. In *Proceedings of the IEEE International Conference on Robotics and Automation*, pages 763–768, Kobe, Japan, 2009.

[225] D. Omrcen, C. Böge, T. Asfour, A. Ude, and R. Dillmann. Autonomous acquisition of pushing actions to support object grasping with a humanoid robot. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 277–283, Paris, France, 2009.

[226] D. Kraft, A. Bierbaum, M. Kjaergaard, J. Ratkevicius, A. Kjaer-Nielsen, C. Ryberg, H. Petersen, T. Asfour, R. Dillmann, and N. Kruger. Tactile object exploration using cursor navigation sensors. In *EuroHaptics conference, 2009 and Symposium on Haptic Interfaces for Virtual Environment and Teleoperator Systems. World Haptics 2009. Third Joint*, pages 296–301, March 2009.

[227] K. Huebner, K. Welke, M. Przybylski, N. Vahrenkamp, T. Asfour, D. Kragic, and R. Dillmann. Grasping known objects with humanoid robots: A box-based approach. In *International Conference on Advanced Robotics (ICAR)*, pages 1–6, Munich, Germany, June 2009.

[228] F. Hecht, P. Azad, T. Asfour, and R. Dillmann. Markerless Human Motion Tracking with a Flexible Model and Appearance Learning. In *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA 2009)*, pages 3173–3179, Kobe, Japan, May 2009.

[229] D. Gonzalez-Aguirre, S. Wieland, T. Asfour, and R. Dillmann. On environmental model-based visual perception for humanoids. In *AGACSE, Applied Geometric Algebras in Computer Science and Engineering*, pages 901–909, Gudalajara, Mexico, 2009.

[230] M. Do, J. Romero, H. Kjellström, P. Azad, T. Asfour, D. Kragic, and R. Dillmann. Grasp Recognition and Mapping on Humanoid Robots. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 465–471, Paris, France, December 2009.

[231] Alexander Bierbaum, Julian Schill, Tamim Asfour, and Rüdiger Dillmann. Force Position Control for a Pneumatic Anthropomorphic Hand. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 21–27, Paris, France, 2009.

[232] Alexander Bierbaum, Matthias Rambow, Tamim Asfour, and Rüdiger Dillmann. Grasp Affordances from Multi-Fingered Tactile Exploration using Dynamic Potential

Fields. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 168 − 174, Paris, France, 2009.

[233] Alexander Bierbaum, Tamim Asfour, and Rüdiger Dillmann. Dynamic Potential Fields for Dexterous Tactile Exploration. In Rüdiger Dillmann Helge Ritter, Gerhard Sagerer and Martin Buss, editors, *Human Centered Robot Systems*, volume 6 of *Cognitive Systems Monographs*, pages 23–31. Springer Berlin Heidelberg, 2009. HCRS Workshop, Bielefeld.

[234] P. Azad, T. Asfour, and R. Dillmann. Stereo-basierte vs. Monokulare 6-DoF Lagebestimmung unter Verwendung von Punktmerkmalen. In *3D-NordOst*, pages 15–24, Berlin, Germany, December 2009.

[235] P. Azad, T. Asfour, and R. Dillmann. Stereo-based vs. Monocular 6-DoF Pose Estimation using Point Features: A Quantitative Comparison. In *Autonome Mobile Systeme (AMS)*, pages 41–48, Karlsruhe, Germany, December 2009.

[236] P. Azad, T. Asfour, and R. Dillmann. Combining Harris Interest Points and the SIFT Descriptor for Fast Scale-Invariant Object Recognition. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pages 4275–4280, St. Louis, USA, October 2009.

[237] P. Azad, T. Asfour, and R. Dillmann. Accurate Shape-based 6-DoF Pose Estimation of Single-colored Objects. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pages 2690–2695, St. Louis, USA, October 2009.

[238] T. Asfour, M. Do, K. Welke, A. Bierbaum, P. Azad, N. Vahrenkamp, S. Gärtner, A. Ude, and R. Dillmann. From sensorimotor primitives to manipulation and imitation strategies in humanoid robots. In C. Pradalier, R. Siegwart, and G. Hirzinger, editors, *International Symposium on Robotics Research (ISRR)*, volume 70 of *Robotics Research, Springer Tracts in Advanced Robotics*, pages 363–378. Springer, 2009.

[239] K. Welke, T. Asfour, and R. Dillmann. Object separation using active methods and multi-view representations. In *IEEE International Conference on Robotics and Automation (ICRA)*, pages 949–955, Pasadena, USA, May 2008.

[240] N. Vahrenkamp, S. Wieland, P. Azad, D. Gonzalez-Aguirre, T. Asfour, and R. Dillmann. Visual Servoing for Humanoid Grasping and Manipulation Tasks. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 406–412, Daejeon, Korea, December 2008.

[241] N. Vahrenkamp, C. Scheurer, T. Asfour, J. Kuffner, and R. Dillmann. Adaptive motion planning for humanoid robots. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pages 2127–2132, Nice, France, 2008.

[242] A. Ude and T. Asfour. Control and recognition on a humanoid head with cameras having different field of view. In *Proc. 19th IAPR Int. Conf. Pattern Recognition*, pages 1–4, Tampa, Florida, 2008.

[243] M. Prats, S. Wieland, T. Asfour, A.P. del Pobil, and R. Dillmann. Compliant Interaction in Household Environments by the Armar-III Humanoid Robot. In

IEEE/RAS International Conference on Humanoid Robots (Humanoids), pages 475 – 480, Korea, 2008.

[244] D.I. Gonzalez-Aguirre, T. Asfour, E. Bayro-Corrochano, and R. Dillmann. Model-based visual self-localization using geometry and graphs. In *International Conference on Pattern Recognition, ICPR 2008, Tampa Florida-USA.*, pages 1–5, Tampa, Florida, USA, 2008.

[245] D. Gonzalez-Aguirre, S. Wieland, T. Asfour, and R. Dillmann. Improving model-based visual self-localization using gaussian spheres. In *AGACSE, Applied Geometric Algebras in Computer Science and Engineering*, pages 1–16, Leipzig, Germany, 2008.

[246] I. Gaiser, S. Schulz, A. Kargov, H. Klosek, A. Bierbaum, C. Pylatiuk, R. Oberle, T. Werner, T. Asfour, G. Bretthauer, and R. Dillmann. A new anthropomorphic robotic hand. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 418–422, Daejeon, Korea, 2008.

[247] M. Do, P. Azad, T. Asfour, and R. Dillmann. Imitation of Human Motion on a Humanoid Robot using Nonlinear Optimization. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 545–552, Daejeon, Korea, December 2008.

[248] A. Bierbaum, M. Rambow, T. Asfour, and R. Dillmann. A Potential Field Approach to Dexterous Tactile Exploration. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 360 – 366, Daejeon, Korea, 2008.

[249] A. Bierbaum, I. Gubarev, and R. Dillmann. Robust Shape Recovery for Sparse Contact Location and Normal Data from Haptic Exploration. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pages 3200–3205, Nice, France, 2008.

[250] A. Bierbaum, T. Asfour, and R. Dillmann. IPSA - Inventor Physics Modeling API for Dynamics Simulation in Manipulation. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Workshop on robot simulators*, Nice, France, 2008.

[251] P. Azad, T. Asfour, and R. Dillmann. Robust Real-time Stereo-based Markerless Human Motion Capture. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 700–707, Daejeon, Korea, December 2008.

[252] T. Asfour, K. Welke, P. Azad, A. Ude, and R. Dillmann. The Karlsruhe Humanoid Head. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 447–453, Daejeon, Korea, December 2008.

[253] K. Welke, E. Oztop, G. Cheng, and R. Dillmann. Exploiting similarities for robot perception. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pages 3237–3242, San Diego, USA, October 2007.

[254] N. Vahrenkamp, T. Asfour, and R Dillmann. Efficient Motion Planning for Humanoid Robots using Lazy Collision Checking and Enlarged Robot Models. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pages 3062–3067, San Diego, USA, October 2007.

[255] A. Ude, M. Riley, B. Nemec, T. Asfour, and G. Cheng. Synthesizing goal-directed actions from a library of example movements. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 115–121, Pittsburgh, USA, 2007.

[256] M. Stilman, J. Schamburek, J. Kuffner, and T. Asfour. Manipulation Planning Among Movable Obstacles. In *IEEE International Conference on Robotics and Automation (ICRA)*, pages 3327–3332, Rome, Italy, April 2007. IEEE.

[257] K. Regenstein, T. Kerscher, C. Birkenhofer, T. Asfour, J.M. Zöllner, and R. Dillmann. Universal Controller Module (UCoM) - component of a modular concept in robotic systems. In *Proceedings of 2007 IEEE International Symposium on Industrial Electronics*, pages 2089–2094, Centro Cultural and Centro Social Caixanova - Vigo, Spain, June 4-7June 2007.

[258] K. Regenstein, T. Kerscher, C. Birkenhofer, T. Asfour, J.M. Zöllner, and R. Dillmann. A modular approach for controlling mobile robots. In *Proceedings of CLAWAR2007, 10th International Conference on Climbing and Walking Robots*, pages 547–554, Singapore, July 16-18July 2007.

[259] D. Omrcen, A. Ude, K. Welke, T. Asfour, and R. Dillmann. Sensorimotor processes for learning object representations. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 143–150, Pittsburgh, USA, 2007.

[260] P. Michel, C. Scheurer, J. Kuffner, N. Vahrenkamp, and R. Dillmann. Planning for robust execution of humanoid motions using future perceptive capability. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pages 3223–3228, San Diego, USA, October 2007.

[261] A. Bierbaum, K. Welke, D. Burger, T. Asfour, and R. Dillmann. Haptic Exploration for 3D Shape Reconstruction using Five-Finger Hands. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 616 – 621, Pittsburgh PA, USA, Nov 29 - Dec 01 2007.

[262] A. Bierbaum, K. Welke, D. Burger, T. Asfour, and R. Dillmann. A Framework for Visually guided Haptic Exploration with Five Finger Hands. In *2007 Robotics: Science and Systems (RSS) Workshop: Robot Manipulation: Sensing and Adapting to the Real World*, pages 674–676, Atlanta, USA, 2007.

[263] P. Azad, A. Ude, T. Asfour, and R. Dillmann. Stereo-based Markerless Human Motion Capture for Humanoid Robot Systems. In *IEEE International Conference on Robotics and Automation (ICRA)*, pages 3951–3956, Rome, Italy, April 2007.

[264] P. Azad, T. Asfour, and R. Dillmann. Toward an Unified Representation for Imitation of Human Motion on Humanoids. In *IEEE International Conference on Robotics and Automation (ICRA)*, pages 2558–2563, Rome, Italy, April 2007.

[265] P. Azad, T. Asfour, and R. Dillmann. Stereo-based 6D Object Localization for Grasping with Humanoid Robot Systems. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pages 919–924, San Diego, USA, October 2007.

[266] K. Welke, E. Oztop, A. Ude, R. Dillmann, and G. Cheng. Learning feature representations for an object recognition system. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 290–295, Genova, Italy, December 2006.

[267] K. Welke, P. Azad, and R. Dillmann. Fast and robust feature-based recognition of multiple objects. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 264–269, Genova, Italy, December 2006.

[268] Klaus Steinbach, J. Kuffner, T. Asfour, and R. Dillmann. Collision and self-collision detection for humanoids based on sphere tree hierarchies. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 560–566, Genova, Italy, 2006.

[269] K. Regenstein, T. Asfour, and R. Dillmann. Designing a computer architecture for the humanoid robot ARMAR-III. In *Proceedings of HLR 2006, French-German Workshop on Humanoid and Legged Robots*, Karlsruhe, Germany, 2006.

[270] A. Morales, P. Azad, T. Asfour, D. Kraft, S. Knoop, R. Dillmann, A. Kargov, C. Pylatiuk, and S. Schulz. An Anthropomorphic Grasping Approach for an Assistant Humanoid Robot. In *International Symposium on Robotics (ISR)*, page 149, Munich, Germany, May 2006.

[271] A. Morales, T. Asfour, P. Azad, S. Knoop, and R. Dillmann. Integrated Grasp Planning and Visual Object Localization For a Humanoid Robot with Five-Fingered Hands. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pages 5663–5668, Beijing, China, October 2006.

[272] A. Lehmann, R. Mikut, and T. Asfour. Petri nets for task supervision in humanoid robots. In *Proc. of 37th International Symposium of Robotics (ISR)*, page 71, Munich, Germany, 2006.

[273] N. Gorges, A. Bierbaum, H. Wörn, and R. Dillmann. Towards a comprehensive grasping system for ARMAR-III. In *Human-Centered Robotic Systems (HCRS'06)*, pages 57–62, Munich, 2006.

[274] D. Bertram, J.J. Kuffner, R. Dillmann, and T. Asfour. An Integrated Approach to Inverse Kinematics and Path Planning for Redundant Manipulators. In *IEEE International Conference on Robotics and Automation (ICRA)*, pages 1874–1879, Orlando, Florida, USA, May 2006. IEEE.

[275] P. Azad, A. Ude, T. Asfour, G. Cheng, and R. Dillmann. Image-based Markerless 3D Human Motion Capture using Multiple Cues. In *International Workshop on Vision Based Human-Robot Interaction*, Palermo, Italy, March 2006.

[276] P. Azad, T. Asfour, and R. Dillmann. Combining Appearance-based and Model-based Methods for Real-Time Object Recognition and 6D Localization. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pages 5339–5344, Beijing, China, October 2006.

[277] T. Asfour, K. Regenstein, P. Azad, J. Schröder, N. Vahrenkamp, and R. Dillmann. ARMAR-III: An Integrated Humanoid Platform for Sensory-Motor Control. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 169–175, Genova, Italy, December 2006.

[278] T. Asfour, K. Regenstein, P. Azad, J. Schröder, and R. Dillmann. ARMAR-III: A Humanoid Platform for Perception-Action Integration. In *2nd International Workshop on Human-Centered Robotic Systems (HCRS)*, pages 51–56, Munich, Germany, 2006.

[279] T. Asfour, F. Gyarfas, P. Azad, and R. Dillmann. Imitation Learning of Dual-Arm Manipulation Tasks in Humanoid Robots. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 40–47, Genova, Italy, December 2006.

[280] A. Morales, T. Asfour, D. Osswald, S. Schulz, and R. Dillmann. Towards an anthropomorphic manipulator for an assistant humanoid robot. In *Robotics: Science and Systems - Workshop on Humanoid Manipulation*, MIT, Boston, USA, 2005.

[281] C. Burghart, R. Mikut, R. Stiefelhagen, T. Asfour, H. Holzapfel, P. Steinhaus, and R. Dillmann. A Cognitive Architecture for a Humanoid Robot: A First Approach. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 357–362, Tsukuba, Japan, 2005.

[282] R. Zöllner, T. Asfour, and R. Dillmann. Programming by Demonstration: Dual-Arm Manipulation Tasks for Humanoid Robots. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pages 479–484, Sendai, Japan, 2004.

[283] D.N. Ly, K. Regenstein, T. Asfour, and R. Dillmann. A Modular and Distributed Embedded Control Architecture for Humanoid Robots. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pages 2775–2780, Sendai, Japan, 2004.

[284] P. Azad, A. Ude, R. Dillmann, and G. Cheng. A Full Body Human Motion Capture System using Particle Filtering and On-The-Fly Edge Detection. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 941–959, Santa Monica, USA, December 2004.

[285] T. Asfour, D.N. Ly, K. Regenstein, and R. Dillmann. Coordinated task execution for humanoid robots. In *The International Symposium on Experimental Robots*, pages 259–267, Singapore, June 2004.

[286] K. Regenstein and R. Dillmann. Design of an open hardware architecture for the humanoid robot ARMAR. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, page 3, Karlsruhe/Munich, Germany, October 1-3October 2003.

[287] T. Asfour and R. Dillmann. Human-like Motion of a Humanoid Robot Arm Based on Closed-Form Solution of the Inverse Kinematics Problem. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pages 407–1412, Las Vegas, USA, 2003.

[288] T. Asfour, A. Ude, K. Berns, and R. Dillmann. Control of ARMAR for the Realization of Anthropomorphic Motion Patterns. In *IEEE/RAS International Conference on Humanoid Robots (Humanoids)*, pages 22–24, Tokyo, Japan, November 22-24 2001.

[289] N. Fukaya, S. Toyama, T. Asfour, and R. Dillmann. Design of the TUAT/Karlsruhe Humanoid Hand. In *IEEE/RSJ International Conference on Intelligent Robots and*

Systems (IROS), pages 1754–1759, Takamatsu, Japan, October 30 - November 5 2000.

[290] N. Fukaya, S. Toyama, T. Asfour, and R. Dillmann. Design of a Humanoid Hand for Human Friendly Robotics Applications. In *International Conference on Machine Automation (ICMA2000)*, pages 4533–4540, Osaka, Japan, September 27-29 2000.

[291] R. Dillmann, T. Asfour, and K. Berns. Design and Control of a Humanoid Typ 2-Arm Robot System. In *World Automation Congress (WAC 2000)*, Albuquerque, NM, USA, June 11-16 2000.

[292] T. Asfour, K. Berns, and R. Dillmann. The Humanoid Robot ARMAR: Design and Control. In *The 1st IEEE-RAS International Conference on Humanoid Robots*, pages 7–8, Boston, USA, 2000.

[293] T. Asfour, K. Berns, J. Schelling, and R. Dillmann. Programming of Manipulation Tasks of the Humanoid Robot ARMAR. In *The Ninth International Conference on Advanced Robotics (ICAR'99)*, pages 107–112, Tokyo, Japan, October 25-27 1999.

[294] T. Asfour, K. Berns, and R. Dillmann. The Humanoid Robot ARMAR. In *The Second International Symposium in HUmanoid RObots (HURO'99)*, pages 174–180, Tokyo, Japan, October 8-9 1999.

In Books

[295] Tamim Asfour, Júlia Borràs, Christian Mandery, Peter Kaiser, Eren Erdal Aksoy, and Markus Grotz. On the dualities between grasping and whole-body loco-manipulation tasks. In A. Bicchi and W. Burgard, editors, *Robotics Research, Springer Tracts in Advanced Robotics*, pages 205–322. Springer, 2018.

[296] Peter Kaiser, Eren E. Aksoy, Markus Grotz, Dimitrios Kanoulas, Nikos G. Tsagarakis, and Tamim Asfour. Experimental evaluation of a perceptual pipeline for hierarchical affordance extraction. In Dana Kulić, Yoshihiko Nakamura, Oussama Khatib, and Gentiane Venture, editors, *2016 International Symposium on Experimental Robotics*, pages 136–146. Springer International Publishing, 2017.

[297] Tamim Asfour, Rüdiger Dillmann, Nikolaus Vahrenkamp, Martin Do, Mirko Wächter, Christian Mandery, Peter Kaiser, Manfred Kröhnert, and Markus Grotz. The Karlsruhe ARMAR Humanoid Robot Family. pages 1–32. In: Goswami A., Vadakkepat P. (eds) Humanoid Robotics: A Reference, Springer Netherlands, Dordrecht, 2017.

[298] M. Przybylski, N. Vahrenkamp, T. Asfour, and R. Dillmann. Grasp and motion planning for humanoid robots. In *Grasping in Robotics*, pages 329–359. Springer, 2013.

[299] N. Vahrenkamp, T. Asfour, and R. Dillmann. Efficient Motion and Grasp Planning for Humanoid Robots. In Kensuke Harada, Eiichi Yoshida, and Kazuhito Yokoi, editors, *Motion Planning for Humanoid Robots*, pages 129–160. Springer, 2010.

[300] D. Gonzalez-Aguirre, T. Asfour, E. Bayro-Corrochano, and R. Dillmann. Model-based visual self-localization using gaussian spheres. chapter Model-Based Visual

Self-Localization Using Gaussian Spheres, pages 299–324. Springer Verlag, 2009, Germany, 2009.

[301] T. Asfour, D.N. Ly, K. Regenstein, and R. Dillmann. Coordinated task execution for humanoid robots. In *Experimental Robotics IX*, volume 21 of *STAR, Springer Tracts in Advanced Robotics*, pages 259–267. Springer Verlag, Berlin/Heidelberg, 2006.

Reports

[302] Nikolaus Vahrenkamp, Tamim Asfour, and Rüdiger Dillmann. Simox: A Simulation and Motion Planning Toolbox for C++. Technical report, Karlsruhe Institute of Technology (KIT), 2010.

[303] K. Welke, M. Przybylski, T. Asfour, and R. Dillmann. Kinematic calibration for saccadic eye movements. Technical report, Institute for Anthropomatics, Universität Karlsruhe, 2008.

[304] M. Kjaergaard, A. Bierbaum, D. Kraft, S. Kalkan, N. Krüger, T. Asfour, and R. Dillmann. Using tactile sensors for multisensorial scene exploration. Technical Report Technical Report no. 2007-5, Robotics Group, The Maersk Mc-Kinney Moller Institute, University of Souther Denmark, Jan 2007.