Info

Name	Dr.-Ing. Timo Korthals
Web Page	https://www.timo-korthals.de/
Skills	sensor & information fusion, robotics, curiosity driven / reinforcement / unsupervised / deep / machine learning, embedded and high-level programming in C/C++, ROS, embedded systems development, Python, Tensorflow, Linux application development, Yocto, Matlab

Professional Career

01/21 - today	**DLR Project** Agri-Gaia - An agribusiness AI ecosystem for the agri-food industry (CES)
10/20 - today	CLAAS E-Systems GmbH (CES)

Ph.D. Thesis

Affiliation	Bielefeld University - Cognitronics & Sensor Systems Group
Title	Deep Generative Models for Multi-Modal Perception under the Influence of Ambiguity
At-A-Glance	My work tackled the **learning of acting on multi-modal data** while facilitating **multi-modal deep generative models** to learn **multi-sensory fusion**. In the context of **artificial intelligence**, my approach contributes to **unsupervised curiosity-driven** learning of **active sensing** for a robot fleet equipped with visual, depth, and proximity sensors.

Academic Career

Affiliations	Cognitronics & Sensor Systems Group (AG-KS) Research Institute for Cognition and Robotics (CoR-Lab) Center for Cognitive Interaction Technology (CITEC) Bielefeld University - Germany (UBi)
11/18 - 09/20	**BMBF Project** ML4Pro^2 Machine Learning for Production and Products - Distributed Robot Fleet Management (CoR-Lab in association with **Miele Cie. KG**)
11/17 - 02/18	**BMBF Concept Elaboration** for Self-Organising Machine Control Systems for Cooperating Agbot Fleets entitled Agrosystems of the Future (CITEC)

01/17 - 12/19	**DAAD PPP Grant** on Learning to act on Multi-Modal Data in collaboration with the ACRV lab at the Queensland University of Technology
02/15 - 02/16	**ERASMUS+ Lecturer** at Aarhus University
07/14 - 10/17	**BMBF Project** in the Leading Edge Cluster for Cyber-Physical Systems for Electronic Environment Detection and Mapping in Agriculture Scenarios (CoR-Lab in association with **CLAAS KGaA mbH**)
09/13 - 12/18	**DFG Project** Mini Robot Developement (CITEC)
09/13 - 06/14	**PhD Scholarship Holder** Mini Robot Developement (CITEC)

Education

03/12 - 06/13	**Electrical Engineering Master - University of Paderborn** Topic: Unsupervised Learning of Acoustic- and Word-Units via Hierarchical, Generative Models
03/10 - 08/10	**Peking/China**, Beihang University of Aeronautics & Astronautics
08/07 - 03/12	**Electrical Engineering Bachelor - University of Paderborn** Topic: Evaluation of Algorithms for Creating Disparity Maps on the Basis of Monucalur Video Streams

RoboCup Competitions

04/14 - 04/16	Open Challenge @Home: 2014 Germany (4^{th}), 2015 Germany (3^{rd}), 2016 Netherlands (2^{nd})
08/14 - 08/16	World Cup @Home: 2014 Brasil (3^{rd}), 2015 China (3^{rd}), 2016 Germany ($\mathbf{1^{st}}$)
03/12	Open Challenge Rescue League: 2012 Germany (3^{rd})

Literature

Walter, O., T. Korthals, R. Haeb-Umbach, and B. Raj (2013). "A hierarchical system for word discovery exploiting DTW-based initialization". In: *2013 IEEE Workshop on Automatic Speech Recognition and Understanding, ASRU 2013 - Proceedings*, pp. 386–391.

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Korthals, Timo, Andreas Skiba, and Thilo Krause (2016). "Einsatz Event-Basierter Systemarchitektur für Erntemaschinen zur Elektronischen Umfelderkennung". In: *74. Tagung LAND.TECHNIK*. VDI e.V.

Korthals, Timo, Andreas Skiba, Thilo Krause, and Thorsten Jungeblut (2016b). "Evidenzkarten-basierte Sensorfusion zur Umfelderkennung und Interpretation in der Ernte". In: *Informatik in der Land-, Forst und Ernährungswirtschaft*, pp. 15–18.

Kragh, Mikkel, Peter Christiansen, Timo Korthals, Thorsten Jungeblut, Henrik Karstoft, and Rasmus N. Jørgensen (2016). "Multi-Modal Obstacle Detection and Evaluation of Occupancy Grid Mapping in Agriculture". In: *International Conference on Agricultural Engineering*. Aarhus.

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Schöpping, Thomas, Timo Korthals, Stefan Herbrechtsmeier, Teerapat Chinapirom, Robert Abel, Marvin Barther, Tristan Kenneweg, Claas Braun, and Ulrich Rückert (2016). *AMiRo-OS*.

Borgsen, Sebastian Meyer zu, Timo Korthals, Florian Lier, and Sven Wachsmuth (2017). "ToBI – Team of Bielefeld: Enhancing Robot Behaviors and the Role of Multi-robotics in RoboCup@Home". In: *RoboCup 2016: Robot World Cup XX*. Ed. by Sven Behnke, Raymond Sheh, Sanem Sarıel, and Daniel D. Lee. Cham: Springer International Publishing, pp. 577–588.

Korthals, Timo, Julian Exner, Thomas Schöpping, Marc Hesse, T. Schopping, and Marc Hesse (2017a). "Semantical Occupancy Grid Mapping Framework". In: *2017 European Conference on Mobile Robots, ECMR 2017*. IEEE.

Korthals, Timo, Mikkel Kragh, Peter Christiansen, and Ulrich Rückert (2017b). "Towards Inverse Sensor Mapping in Agriculture". In: *IROS 2017 Workshop on Agricultural Robotics: learning from Industry 4.0 and moving into the future*. Vancouver.

Korthals et al. (2017). "MIELE Robotik-Kompetenzen im Bereich Staubsaugerroboter". In:

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Neitemeier, Dennis, Thilo Krause, Timo Korthals, Andreas Skiba, and Boris Kettelhoit (2018a). *AGRICULTURAL MACHINES WITH IMAGE PROCESSING SYSTEM*.

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