Prof. Dr. Marcin Grzegorzek

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Scientific Goal

Extracting health-related knowledge from multimodal sensor data using pattern recognition and machine learning algorithms.

Scientific Fields

Medical Data Science	Pattern Recognition	Machine Learning	Sensor Data Analysis

Medical Data Science Team

M.Sc. Adeel Nisar	B.Sc. Artur Piet	M.Sc. Frédéric Li
M.Sc. Hawzhin Hozhabr Pour	M.Sc. Laura Liebenow	M.Sc. Markus Bullmann
M.Sc. Markus Ebner	M.Sc. Philip Gouverneur	M.Sc. Raoul Hoffmann
M.Sc. Tausif Irshad	M.Sc. Toni Fetzer	M.Sc. Xinyu Huang

Academic Employment and Degrees

Since 10/2018	**Professor** (W3); Institute of Medical Informatics; University of Lübeck, Germany
10/2016 – 09/2018	**Senior Lecturer** (A14); Research Group for Pattern Recognition; University of Siegen; Germany
09/2015 – 09/2018	**Associate Professor**; Department of Knowledge Engineering; University of Economics in Katowice; Poland
01/2014	**Habilitation** in Pattern Recognition; AGH University of Science and Technology in Kraków; Poland
06/2013	**Positive Evaluation of the Assistant Professorship**; University of Siegen; Germany
10/2010 – 09/2016	**Assistant Professor** (W1); Research Group for Pattern Recognition; University of Siegen; Germany
03/2008 – 09/2010	**Postdoc**; Institute for Web Science and Technologies (Prof. Steffen Staab) and Active Vision Group (Prof. Dietrich Paulus); University of Koblenz-Landau; Germany
04/2007	**PhD with Distinction** in Pattern Recognition (Supervisor: Prof. Heinrich Niemann); Pattern Recognition Lab; University of Erlangen-Nürnberg; Germany
07/2006 – 02/2008	**Research Assistant**; Multimedia and Vision Research Group (Prof. Ebroul Izquierdo); Queen Mary University of London; UK
12/2002 – 06/2006	**PhD Candidate**; Pattern Recognition Lab (Prof. Heinrich Niemann and Prof. Joachim Hornegger); University of Erlangen-Nürnberg; Germany
11/2002	**M.Sc.** in Computer Science; Silesian University of Technology in Gliwice; Poland

Selected Publications

1. Jinghua Zhang, Chen Li, Sergey Kosov, Marcin Grzegorzek, Kimiaki Shirahama, Tao Jiang, Changhao Sun, Zihan Li, and Hong Li. LCU-Net: A Novel Low-Cost U-Net for Environmental Microorganism Image Segmentation. *Pattern Recognition (Elsevier, IF: 7.196)*, 115, July 2021. DOI: 10.1016/j.patcog.2021.107885.

2. Xinyu Huang, Kimiaki Shirahama, Frédéric Li, and Marcin Grzegorzek. Sleep Stage Classification for Child Patients Using DeConvolutional Neural Network. *Artificial Intelligence in Medicine (Elsevier, IF: 4.383)*, 110, November 2020. DOI: 10.1016/j.artmed.2020.101981.

3. Frédéric Li, Kimiaki Shirahama, Muhammad Adeel Nisar, Xinyu Huang, and Marcin Grzegorzek. Deep Transfer Learning for Time Series Data Based on Sensor Modality Classification. *Sensors (MDPI, IF: 3.275)*, 20(15), July 2020. DOI: 10.3390/s20154271.

4. Muhammad Adeel Nisar, Kimiaki Shirahama, Frédéric Li, Xinyu Huang, and Marcin Grzegorzek. Rank Pooling Approach for Wearable Sensor-based ADLs Recognition. *Sensors (MDPI, IF: 3.275)*, 20(12), June 2020. DOI: 10.3390/s20123463.

5. Sergey Kosov, Kimiaki Shirahama, Chen Li, and Marcin Grzegorzek. Environmental Microorganism Classification Using Conditional Random Fields and Deep Convolutional Neural Networks. *Pattern Recognition (Elsevier, IF: 5.898)*, 77(5):248–261, May 2018. DOI: 10.1016/j.patcog.2017.12.021.

6. Frédéric Li, Kimiaki Shirahama, Muhammad Adeel Nisar, Lukas Köping, and Marcin Grzegorzek. Comparison of Feature Learning Methods for Human Activity Recognition using Wearable Sensors. *Sensors (MDPI, IF: 3.275)*, 18(2), February 2018. DOI: 10.3390/s18020679.

Selected Projects

1. ScreenFM: Sensor-based Assessment of Infants' Neurological Development Based on Fidgety Movements. Leader of the WP "Learning-based Pattern Recognition Algorithms and Their Evaluation". German Federal Ministry of Education and Research (BMBF). 05/2021 - 04/2014.

2. SENSE: Systemic Nutritional Medicine. Leader of the WP "Platform for Systemic Nutritional Medicine". DAMP Foundation. 05/2021 - 04/2024.

3. PainMonit: Multimodal Platform for Pain Monitoring in Physiotherapy. Leader of the WP "Pain Monitoring Based on Physiological and Behavioural Data". German Federal Ministry of Education and Research (BMBF). 01/2019 - 12/2021. http://ixp-duesseldorf.de/portfolio/painmonit.

4. My-AHA: My Active and Healthy Ageing. Leader of the WP "Data Fusion and Analytics". European Commission, Horizon 2020. 01/2016 – 03/2020. www.activeageing.unito.it.

5. SenseVojta: Sensor-based Diagnosis, Therapy and Aftercare According to the Vojta Principle. Leader of the WP "Sensor-based Recognition of Reflex Patterns". German Federal Ministry of Education and Research (BMBF). 12/2016 – 02/2020.

6. CogAge: Cognitive Village – Adaptively Learning Technical Assistance for Elderly. Consortium Coordinator and Leader of the WP "Adaptive Data Interpretation". German Federal Ministry of Education and Research (BMBF). 09/2015 – 11/2018.

7. GRK 1564: Research Training Group 1564 "Imaging New Modalities". Leader of the Subproject "Multimodal Scene Analysis". German Research Foundation (DFG). 10/2009 – 09/2018. www.grk1564.uni-siegen.de .

Supervised Doctorates

1. Frank Ebner. "Smartphone-Based 3D Indoor Localization and Navigation". Exam: 21/09/2020.

2. Ahmad Delforouzi. New Approaches for Object Tracking and Image-based Quality Control. Exam: 22/07/2020.

3. Muhammad Hassan Khan. Human Activity Analysis in Visual Surveillance and Healthcare. Exam: 13/09/2018.

4. Lukas Köping. Probabilistic Fusion of Multiple Distributed Sensors. Exam: 07/09/2018.

5. Sergey Kosov. Multi-layer Conditional Random Fields for Revealing Unobserved Entities. Exam: 19/07/2018.

6. Zeyd Boukhers. 3D Trajectory Extraction from 2D Videos for Human Activity Analysis. Exam: 26/09/2017.

7. Cong Yang. Object Shape Generation, Representation and Matching. Exam: 26/09/2016.

8. Christian Feinen. Object Representation and Matching Based on Skeletons and Curves. Exam: 10/03/2016.

9. Chen Li. Content-based Microscopic Image Analysis. Exam: 16/02/2016.