Publications, Patents, Talks

2022

Lehrstuhl für Medizinische Informationstechnik
Helmholtz-Institut für Biomedizinische Technik
Rheinisch-Westfälische Technische Hochschule Aachen

Chair for Medical Information Technology
Helmholtz-Institute for Biomedical Engineering
RWTH Aachen University

Director:

Univ.-Prof. Dr.-Ing. Dr. med. Dr. h.c.
Steffen Leonhardt

Buchbeiträge mit anonymem Gutachterwesen 2022 / Peer-reviewed book chapters 2022

1. T. Noppeney, H. Nüllen, V. Blazek, K. Pfister „Hämodynamische Diagnostik", S. 93-120, Varikose, 2. Auflage, Springer Verlag, ISBN 978-3-662-59116-1. https://doi.org/10.1007/-978-3-662-59117-8 2022.

Artikel in Zeitschriften mit anonymem Gutachterwesen 2022 / *Papers in peer-reviewed Journals* 2022

1. I. Badiola, V. Blazek, V. Jagadeesh Kumar, B. George, S. Leonhardt, C.H. Antink, „Accuracy enhancement in reflective pulse oximetry by considering wavelength-dependent pathlengths", *Physiological Measurement* 43(9):095001, 2022. https://doi.org/10.1088/-1361-6579/ac890c.

2. S.C. Behr, C. Platen, P. Vetter, N. Heussen, S. Leonhardt, T. Orlikowsky, K. Heimann, "Detection of acute ventilatory problems via magnetic induction in a newborn animal model", *Pediatric Research* 91(5):1106–1112, 2022. https://doi.org/10.1038/s41390-021-01594-4.

3. L. Bergmann, O. Lück, D. Voss, P. Buschermöhle, L. Liu, S. Leonhardt, C. Ngo, "Lower Limp Exoskeleton with Compliant Actuators: Design, Modeling, and Human Torque Estimation", *IEEE/ASME Transactions on Mechatronics*, 28(2):758-769, 2022. doi: 10.-1109/TMECH.2022.3206530.

4. L. Bergmann, L. Hansmann, S. Leonhardt, C. Ngo, „Hardware development and control of a motorized rollator as an extension for exoskeletons", *at – Automatisierungstechnik* 70(11):1017–1026, 2022. https://doi.org/10.1515/auto-2022-0045.

5. E. Boerger, M. Russ, P. von Platen, M. Taher, L. Hinken, A. Pomprapa, R. Koebrich, F. Konietschke, J. A. Graw, B. Lachmann, W. Braun, S. Leonhardt, P. A. Pickerodt, R. C. E. Francis, "Induction of severe hypoxemia and low lung recruitability for the evaluation of therapeutic ventilation strategies: a translational model of combined surfactant-depletion and ventilator-induced lung injury", *Intensive Care Medicine Experimental* 10:32, 2022. https://doi.org/10.1186/s40635-022-00456-5.

6. P. Borchers, P. Winnersbach, S. Kraemer, C. Beckers, E. M. Buhl, S. Leonhardt, R. Rossaint, M. Walter, T. Breuer, C Bleilevens, "Comparison of the Hemocompatibility of an

Axial and a Centrifugal Left Ventricular Assist Device in an In VitroTest Circuit", ***Journal of Clinical Medicine***, 11(12), 3431, 2022. https://doi.org/10.3390/jcm11123431.

7. S. Borik, S. Lyra, V. Perlitz, M. Keller, S. Leonhard, V. Blazek, „On the spatial phase distribution of cutaneous low-frequency perfusion oscillations", ***Scientific Reports***, 12(1):5997, 2022. https://doi.org/10.1038/s41598-022-09762-0.

8. A. Briko, V. Kapravchuk, A. Kobelev, A. Tikhomirov, A. Hammoud, M. Al-Harosh, S. Leonhardt, C. Ngo, Y. Gulyaev, S. Shchukin, „Determination of the Geometric Parameters of Electrode Systems for Electrical Impedance Myography: A Preliminary Study", ***Sensors*** 22 (1), 97, 3 2022. https://doi.org/10.3390/s22010097.

9. A. Briko, V. Kapravchuk, A. Kobelev, A. Hammoud, S. Leonhardt, C. Ngo, Y. Gulyaev, S. Shchukin, „A Way of Bionic Control Based on EI, EMG, and FMG Signals", ***Sensors*** 22, 152, 2022. https://doi.org/10.3390/s22010152.

10. C. Castelar Wembers, F. Flürenbrock, B. Maurer, A. Benninghaus, K. Radermacher, S. Leonhardt, „A mechatronic test-bench to investigate the impact of ventricular pulsation in hydrocephalus", ***Biomedical Signal Processing and Control*** 75:103579, 2022. https://doi.org/10.1016/j.bspc.2022.103579.

11. S. Chandrasekaran, M. Lüken, S. Leonhardt, U. Gandhi, T. Laurentius, C. Bollheimer, C. Ngo, „Estimation of Step Length with Wearable Thigh Sensor using an Unscented Kalman Filter", **IEEE *Journal of Biomedical and Health Informatics***, 26(8):3779-3790, 2022. 10.1109/JBHI.2022.3176432.

12. T. Laurentius, J. Quandel, L.C. Bollheimer, S. Leonhardt, C. Ngo, M. Lüken, „Spatiotemporal gait parameters in young individuals wearing an age simulation suit compared to healthy older individuals", ***Eur Rev Aging Phys Act*** **19**:29, 2022. https://doi.org/10.1186/s11556-022-00298-w.

13. L. Leicht, M. Walter, M. Mathissen, C.H. Antink, D. Teichmann, S. Leonhardt, „Unobtrusive measurement of physiological features under simulated and real driving conditions", **IEEE *Transactions on Intelligent Transportation Systems*** 23(5):4767-4777, 3, 2022. doi: 10.1109/TITS.2022.3143004.

14. Y. Li , X. Guan , W. Li , B. Penzlin, K. Liu, Z. Yang, B. Liu, S. Leonhardt, L. Ji, „Dynamic Parameter Identification of a Human-Exoskeleton System with the Motor Torque Data", **IEEE *Transactions on Medical Robotics and Bionics*** 4(1):206-218, 2022. doi 10.1109/TMRB.2021.3137970.

15. O. Linschmann, S. Leonhardt, A. Vehkaoja, C. Hoog Antink, „Estimation of the respiratory rate from ballistocardiograms using the Hilbert transform", ***BioMedical Engineering OnLine*** 21(1):54, 2022. https://doi.org/10.1186/s12938-022-01024-4.

16. S. Lyra, J. Rixen, K. Heimann, S. Karthik, J. Joseph, K. Jayaraman, T. Orlikowsky, M. Sivaprakasam, S. Leonhardt, C. Hoog Antink, „Camera fusion for real-time temperature monitoring of neonates using deep learning", ***Medical & Biological Engineering & Computing*** 60(6):1787-1800, 2022. https://doi.org/10.1007/s11517-022-02561-9.

17. C. Ngo, C. Munoz, M. Lueken, A. Hülkenberg, C. Bollheimer, A. Briko, A. Kobelev, S. Shchukin, S. Leonhardt „A Wearable, Multi-Frequency Device to Measure Muscle Activity Combining Simultaneous Electromyography and Electrical Impedance Myography", *Sensors* 22 (5), 1941, 2 2022. https://doi.org/10.3390/s22051941.

18. J. Rixen, B. Eliasson, B. Hentze, T. Muders, C. Putensen, S. Leonhardt, C. Ngo, „A Rotational Invariant Neural Network for Electrical Impedance Tomography Imaging without Reference Voltage: RF-REIM-NET", *Diagnostics* 12 (4), 777, 1 2022. https://doi.org/-10.3390/diagnostics12040777.

19. V. Selvaraju, N. Spicher, J. Wang, N. Ganapathy, J.M. Warnecke, S. Leonhardt, R. Swaminathan, T.M. Deserno, „Continuous Monitoring of Vital Signs Using Cameras: A Systematic Review", *Sensors* 22 (11), 4097, 5 2022. https://doi.org/10.3390/s22114097

20. D.U. Uguz, Z.T. Canbaz, C.H. Antink, M. Lüken, S. Leonhardt, „A Novel Sensor Design for Amplitude Modulated Measurement of Capacitive ECG", **IEEE** *Transactions on Instrumentation and Measurement* 71:1-10, 2022. doi: 10.1109/TIM.2022.3145401.

21. F. Voss, S. Lyra, D. Blase, S. Leonhardt, M. Lüken, „A Setup for Camera-Based Detection of Simulated Pathological States using a Neonatal Phantom", *Sensors* 22 (3), 957, 1 2022. https://doi.org/10.3390/s22030957.

22. C. Weiss, A. Kirmas, S. Lemcke, S. Böshagen, M. Walter, L. Eckstein, S. Leonhardt, „Head tracking in automotive environments for driver monitoring using a low resolution thermal camera", *Vehicles* 4 (1), 219-233, 1 2022. https://doi.org/10.3390/vehicles4010014.

23. X. Yu, C. Hoog Antink, S. Leonhardt, L. C. Bollheimer, T. Laurentius, „Non-Contact Measurement of Heart Rate Variability in Frail Geriatric Patients: Response to Early Geriatric Rehabilitation and Comparison with Healthy Old Community-Dwelling Individuals - A Pilot Study", *Gerontology* 68(6):707-719, 2022. doi: 10.1159/000518628.

Editorials 2022

24. D.S. Karbing, S. Leonhardt, G. Perchiazzi, J.H.T. Bates, „What is new in respiratory monitoring? *Journal of Clinical Monitoring and Computing*, 3:1-9, 2022. https://doi.org/-10.1007/s10877-022-00876-4.

Special Issues 2022

1. *T. Deserno, C. Baumgartner, S. Leonhardt „ Special Issue: Sensors toward Unobtrusive Health Monitoring II", Sensors 2022, ISSN 1424-8220.* https://www.mdpi.com/journal/-sensors/special_issues/Unobtrusive_Health_Monitoring

Konferenzbeiträge mit Beteiligung des Lehrstuhls 2022 / *Conference Proceedings* 2022

35. Wissenschaftliche Arbeitstage der DGAI e.V., 11. & 12. März 2022.

1. M.M. Deininger, D. Ziles, T. Seemann, A. Lohse, C.F. Benner, S. Leonhardt, M. Walter, T. Breuer, „Pilotstudie zur stimulierten Beatmung mittels extrathorakaler, Ultraschall-gesteuerter Elektroden-Platzierung am Nervus phrenicus im Schwein", 35. Wissenschaftliche Arbeitstage der DGAI e.V. 15, 11. & 12. März 2022.

VDI- Fachtagung MECHATRONIK 2022, Darmstadt, 23.-24.03.2022.

2. M. Walter, A. Stollenwerk, L. Eckstein, S. Kowalewski, S. Leonhardt, „PV1000 – Interdisziplinäre Entwicklung eines Pandemie-Beatmungsgerätes", Fachtagung VDI **MECHATRONIK 2022**, Darmstadt, 23.-24.03.2022. https://doi.org/10.26083/tuprints-00020963.

Advanced Technologies & Treatments for Diabetes (ATTD 2022), 27-30 April 2022, Barcelona, Spain.

3. B. Romanski, S. Leonhardt, M. Walter „Modelling the Impact of Exercise on Basal Insulin Uptake", Advanced Technologies & Treatments for Diabetes (**ATTD 2022**), 27-30 April 2022, Barcelona, Spain.

26th International Student Conference on Electrical Engineering (POSTER 2022), Faculty of Electrical Engineering, CTU Prague, May 12th, 2022.

4. I. Badiola, „Bioimpedance Measurement System for the Investigation of Intracranial Dynamics", 26th International Student Conference on Electrical Engineering (**POSTER 2022**), Faculty of Electrical Engineering, CTU Prague, May 12, 2022.
5. C.F. Benner, „Modeling and Control of Blood Glucose in the Intensive Care Unit, 26th International Student Conference on Electrical Engineering (POSTER 2022), Faculty of Electrical Engineering, CTU Prague, May 12, 2022.
6. L. Bergmann, Ö. Mert, P. Zunzer, „Hardware Design, Modeling and Wheelie Control of a Motorized Walker", 26th International Student Conference on Electrical Engineering (**POSTER 2022**), Faculty of Electrical Engineering, CTU Prague, May 12, 2022.
7. Patrick Borchers, „Resistivity-based Determination of Pump-induced Hemolysis in Whole Blood", 26th International Student Conference on Electrical Engineering (**POSTER 2022**), Faculty of Electrical Engineering, CTU Prague, May 12, 2022.
8. O. Linschmann, "Influence of the Transformation of the Unscented Kalman Filter for Sensor Fusion", 26th International Student Conference on Electrical Engineering (**POSTER 2022**), Faculty of Electrical Engineering, CTU Prague, May 12, 2022.
9. S. Lyra, S. Rira, „Real-Time Segmentation of Neonates on Embedded GPUs via Deep Learning", 26th International Student Conference on Electrical Engineering (**POSTER 2022**), Faculty of Electrical Engineering, CTU Prague, May 12, 2022.

10. P von Platen, A Abdelsamed, "History and Challenges of Automatic Feedback Control of Oxygenation", 26th International Student Conference on Electrical Engineering (**POSTER 2022**), Faculty of Electrical Engineering, CTU Prague, May 12, 2022.

11. J. Rixen, B. Hentze, „Neural Network to improve Electrical Impedance Tomography Reconstructions using the GREIT Algorithm", 26th International Student Conference on Electrical Engineering (**POSTER 2022**), Faculty of Electrical Engineering, CTU Prague, May 12, 2022.

12. F. Röhren, „A Toolchain Using Functional Electrical Stimulation (FES) For Automated Drumming", 26th International Student Conference on Electrical Engineering (**POSTER 2022**), Faculty of Electrical Engineering, CTU Prague, May 12, 2022.

13. B. Romanski, „Approaches to Model the Impact of Exercise on the Blood Glucose Level in Type 1 Diabetes", 26th International Student Conference on Electrical Engineering (**POSTER 2022**), Faculty of Electrical Engineering, CTU Prague, May 12, 2022.

14. D. F. Silva, „A Data-Efficient Deep Learning Architecture Tailored to Cardiac Sensor Fusion", 26th International Student Conference on Electrical Engineering (**POSTER 2022**), Faculty of Electrical Engineering, CTU Prague, May 12, 2022.

15. F. Voss, C. Stapper, S. Lyra, „Multi-Modal Body Part Detection of Infants using Deep Learning", 26th International Student Conference on Electrical Engineering (**POSTER 2022**), Faculty of Electrical Engineering, CTU Prague, May 12, 2022.

48. Jahrestagung der Gesellschaft für Neonatologie und Pädiatrische Intensivmedizin (GNPI) & 29. Jahrestagung der Deutschen Gesellschaft für Pädiatrische Infektiologie (DGPI), Aachen, 19.-21. Mai 2022.

16. M. Brasche, S. Lyra, F. Voß, S. Leonhardt, T. Orlikowsky, K. Heimann, „Systemic Inflammatory Response Indication Observer (SIRIO) – ein Mess-System zur kontaktlosen Erfassung klinischer Frühsymptome einer neonatalen Sepsis? 48. Jahrestagung der Gesellschaft für Neonatologie und Pädiatrische Intensivmedizin (**GNPI 2022**), Aachen, 19.-21. Mai 2022.

21st International Conference on Image Analysis and Processing (ICIAP 2022), Lecce, Italy, May 23–27, 2022.

17. S. Lyra, I. Groß-Weege, S. Leonhardt, M. Lüken, „Real-Time Respiration Monitoring of Neonates from Thermography Images Using Deep Learning", International Conference on Image Analysis and Processing (**ICIAP 2022**), pp. 221-232, 2022.

ASAIO 2022 - 67th Annual ASAIO Conference, June 8 - 11, 2022, Chicago, IL, USA

18. L. Korn, S. Leonhardt, M. Zeilinger, M.S. Daners, S.A. Dual, „P65: Dual-modality Volume Estimation and its Impact On A Preload-Sensitive Controller", **ASAIO Journal** 68 (Supplement 2), 130, 2022. doi: 10.1097/01.mat.0000841476.73195.d5.

IUPESM World Congress on Medical Physics and Biomedical Engineering (IUPESM WC2022), 12 – 17 June 2022, Singapore.

19. I. Badiola, J. Kaufmann, E. Wichmann, V.Phan, M. Lueken, V. Blazek, S. Leonhardt, „Novel system to analyze cuff pressure effect on arterial and venous blood pulses with simultaneous reflective and transmissive PPG", IUPESM World Congress on Medical Physics and Biomedical Engineering (**IUPESM WC2022**), 12 – 17 June 2022, Singapore.
20. J. Rixen, B. Hentze, C. Ngo, S. Leonhardt, C. Hoog Antink, „Reconstruction Improvement of Electrical Impedance Tomography through a Convolutional Neural Network", IUPESM World Congress on Medical Physics and Biomedical Engineering (**IUPESM WC2022**), 12 – 17 June 2022, Singapore.
21. D. U. Uguz, P. Weidener, L. Keune, S. Leonhardt, M. Lueken, „Local Analysis of Physiological Motion Artifacts in Capacitive Electrocardiogram using a Multimodal Sensor", IUPESM World Congress on Medical Physics and Biomedical Engineering (**IUPESM WC2022**), 12 – 17 June 2022, Singapore.
22. F. Voss, J. Wolski, D. Blase1, S. Leonhardt1, M. Lüken, „Live Temperature Calibration for Neonatal Thermography", IUPESM World Congress on Medical Physics and Biomedical Engineering (**IUPESM WC2022**), 12 – 17 June 2022, Singapore.

International Conference of Bioelectromagnetism, Electrical Bioimpedance, and Electrical Impedance Tomography (ICEBEM – ICEBI – EIT 2022), June 28 – July 1, 2022, digital / Kyung Hee University, Seoul, Korea

23. A. Hülkenberg, S. Leonhardt, C. Ngo, „The influence of isometric and isotonic muscle contraction on measured resistance and reactance during seated leg curls", Int. Conference of Bioelectromagnetism, Electrical Bioimpedance, and Electrical Impedance Tomography (**ICEBEM – ICEBI – EIT 2022**), June 28 – July 1, 2022, digital / Kyung Hee University, Seoul, Korea.
24. D. F. Silva, S. Leonhardt, C. Ngo, „A Top-to-Bottom Generator of EIT and CT Bolus Signals", Int. Conference of Bioelectromagnetism, Electrical Bioimpedance, and Electrical Impedance Tomography (**ICEBEM – ICEBI – EIT 2022**), June 28 – July 1, 2022, digital / Kyung Hee University, Seoul, Korea.
25. D. F. Silva, C. Wemmer, M.-L. Wolter, S. Leonhardt, C. Ngo, „Unsupervised Clustering of Lung Perfusion Features", Int. Conference of Bioelectromagnetism, Electrical Bioimpedance, and Electrical Impedance Tomography (**ICEBEM – ICEBI – EIT 2022**), June 28 – July 1, 2022, digital / Kyung Hee University, Seoul, Korea.

44th Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC 2022), Glasgow, UK, 11-15 July 2022

26. A. Lohse, P. von Platen, C.F. Benner, S. Leonhardt, M. Walter, M.M. Deininger, D. Ziles, T. Seemann, T. Breuer „Identification of the Tidal Volume Response to Pulse Amplitudes of Phrenic Nerve Stimulation Using Gaussian Process Regression", 44th Annual International Conference of the IEEE Engineering in Medicine & Biology Society (**EMBC 2022**), pp. 135-138, 2022.
27. F. Röhren, P. von Platen, S. Leonhardt, M. Walter, „Modelling and Validation of a Decentralized Breathing Gas Source", 44th Annual International Conference of the IEEE Engineering in Medicine & Biology Society (**EMBC 2022**), pp. 625-628, 2022.

28. P. von Platen, A. Hallmann, A. Lohse, S. Leonhardt, M. Walter, „Fuzzy-Based Expert Supervision System for Feedback Controlled Oxygenation", 44th Annual International Conference of the IEEE Engineering in Medicine & Biology Society (**EMBC 2022**), pp. 962-965, 2022.

29. S. Chandrasekaran, M. Lueken, S. Leonhardt, U. Gandhi, T. Laurentius, C. Bollheimer, C. Ngo „Step Length Estimation with Wearable Wrist Sensor using ANN", 44th Annual International Conference of the IEEE Engineering in Medicine & Biology Society (**EMBC 2022**), pp. 1125-1128, 2022.

30. N.N. Sahoo, B. Murugesan, A. Das, S. Karthik, K. Ram, S. Leonhardt, J. Joseph, M. Sivaprakasam „Deep learning based non-contact physiological monitoring in Neonatal Intensive Care Unit", 44th Annual International Conference of the IEEE Engineering in Medicine & Biology Society (**EMBC 2022**), pp. 1327-1330, 2022.

31. M. Lueken, J. Wenner, S. Leonhardt, C. Ngo, „Using Synthesized IMU Data to Train a Long-Short Term Memory-based Neural Network for Unobtrusive Gait Analysis with a Sparse Sensor Setup", 44th Annual International Conference of the IEEE Engineering in Medicine & Biology Society (**EMBC 2022**), pp. 3653-3656, 2022.

32. M. Lueken, T. Laurentius, L.C. Bollheimer, S. Leonhardt, C. Ngo, „Identification of Individually Altered Gait Behavior Using an Unobtrusive IMU Sensor Setup", 44th Annual International Conference of the IEEE Engineering in Medicine & Biology Society (**EMBC 2022**), pp. 4183-4187, 2022.

BIOSIGNAL 2022 Workshop, Aug. 24th – 26th, 2022, Dresden, Germany.

33. O. Linschmann, D. U. Uguz, P. Gunaratne, S. Leonhardt, M. Walter and M. Lüken, „A Portable Multi-modal Cushion for Continuous Monitoring of a Driver's Vital Signs", **BIOSIGNAL 2022** Workshop, Aug. 24th – 26th, 2022, Dresden, Germany.

34. M. Lueken, O. Linschmann, D.U. Uguz, M. Walter, S. Leonhardt, "Multi-Redundant Sensor Setup for Unobtrusive Monitoring of Heart Rate in a Bed-integrated Scenario", **BIOSIGNAL 2022** Workshop, Aug. 24th – 26th, 2022, Dresden, Germany.

35. M. Rohr, Z. Huang, U. Uguz, S. Leonhardt, C. Hoog Antink, „Limitations of Pacemaker Spike Detection in Capacitive ECGs via Deep Learning", **BIOSIGNAL 2022** Workshop, Aug. 24th – 26th, 2022, Dresden, Germany.

Computing in Cardiology (CincC), September 4-7, 2022, Tampere, Finland.

36. O. Linschmann, C. Revander, S. Leonhardt, M. Lueken, „Motion Artifact Detection and Classification for Unobtrusive Cardiorespiratory Signals using Machine Learning", 2022 Computing in Cardiology (**CinC 2022**) 498, 1-4, 2022.

ESAO 2022 - 48th Annual Congress of the European Society for Artificial Organs, Sep. 6-10, 2022, Krems, Austria.

37. P. Borchers, S. Leonhardt, M. Walter, "Automated test loop to assess pump-induced hemolysis under pulsatile operating conditions", 48th Annual Congress of the European Society for Artificial Organs (**ESAO 2022**), Sep. 6-10, 2022, Krems, Austria.

38. D. Voss, S. Leonhardt, M. Walter, "Investigation of Impedance Based Aortic Flow Measurements (Impedance-based blood flow measurement with a diagnostic catheter)", 48th

Annual Congress of the European Society for Artificial Organs (**ESAO 2022**), Sep. 6-10, 2022, Krems, Austria.

Gemeinsamer Jahreskongress der Deutschen Gesellschaft für Geriatrie (DGG) und der Deutschen Gesellschaft für Gerontologie und Geriatrie (DGGG), 12. bis 15. Sep. 2022, Frankfurt am Main.

39. T. Laurentius, D. Blase, C. Bollheimer, S. Leonhardt, S. Dahlmanns, M. Lueken, „Detection of 1st and 2nd Degree Decubitus in the Coccyx by using camera-based Technology", *Zeitschrift für Gerontologie und Geriatrie* 55 (SUPPL 1), pp. 147-148, 2022.

43. Jahrestagung der Gesellschaft für Pädiatrische Pneumologie, Bern, 28.–30.09.2022

40. A. Rein, C. Ngo, M. Van den Berg, S. Böll, L. Lassay, U. Kontny, N. Wagner, S. Leonhardt, K. Tenbrock, E. Verjans, „Characterization of pulmonary function impairment in a pediatric sickle cell anemia cohort using electrical impedance tomography", *Klinische Pädiatrie* 234(05):330, P12, 2022. doi: 10.1055/s-0042-1754474.

2022 Joint Annual Conference of the Austrian (ÖGBMT), German (VDE DGBMT) and Swiss (SSBE) Societies for Biomedical Engineering, including the 14. Vienna International Workshop on Functional Electrical Stimulation, BMT 2022, Innsbruck, Austria, 28 - 30 Sep. 2022

41. C. Lyu, B. Holst, F. Röhren, B. Penzlin, S. Leonhardt, C. Ngo, „Hybrid FES-Exoskeleton Control for Walking Gait Correction", *Current Directions in Biomedical Engineering* 8 (3), 9-12, 2022.
42. S. Chandrasekaran, C. Ngo, M. Lueken, C. Bollheimer, A. Wolf, S. Leonhardt, „On Gait Stability: Correlations between Lyapunov Exponent and Stride Time Variability", *Current Directions in Biomedical Engineering* 8 (2), 564-567, 2022.
43. C. F. Benner, S. Leonhardt, M. Walter, "Blood Glucose Control in Critically Ill Patients", **BMT 2022** - Gemeinsame Jahrestagung der Österreichischen, Deutschen und Schweizer Gesellschaften für Biomedizinische Technik (VDE DGBMT, ÖGBMT und SSBE), 28. bis 30. Sep. 2022, Innsbruck, Tirol.
44. C. Weiss, S. Leonhardt, M. Lüken, "Classification of Facial Expression using Convolutional Neural Network and Support Vector Machine", **BMT 2022** - Gemeinsame Jahrestagung der Österreichischen, Deutschen und Schweizer Gesellschaften für Biomedizinische Technik (VDE DGBMT, ÖGBMT und SSBE), 28. bis 30. Sep. 2022, Innsbruck, Tirol.

arXiv preprints

- C.S. Pilz, B. Clemens, I.C. Hiss, C. Weiss, U. Canzler, J. Krajewski, U. Habel, ..., „The Face of Affective Disorders", arXiv preprint arXiv:2208.01369, 2022.

- N. Nirlipta Sahoo, B. Murugesan, A. Das, S. Karthik, K. Ram, S. Leonhardt, ..., „Deep learning based non-contact physiological monitoring in Neonatal Intensive Care Unit", arXiv e-prints, arXiv: 2207.11886, 2022.

Eingeladene Vorträge 2022 /

Invited Talks and Lectures 2022

Physical Talks

1. S Leonhardt, "Noninvasive Lungenmeßverfahren aus technischer Sicht", **48. Jahrestagung der Gesellschaft für Neonatologie und Pädiatrische Intensivmedizin (GNPI)** & 29. Jahrestagung der Deutschen Gesellschaft für Pädiatrische Infektiologie (DGPI), GNPI-Session: „Noninvasives Lungenmonitoring auf der NICU - wo stehen wir?", Aachen, 19.-21. Mai 2022.

2. S Leonhardt, "Unobtrusive vital sign monitoring in automotive environments", The 9th **International Workshop on Naturalistic Driving Data Analytics** (NDDA), sponsored by IEEE ITSS Technical Committee on Data Analytics and Intelligent Systems for Advanced Driving and Mobility (DAISY), **IEEE *Intelligent Vehicles Symposium*** - IV 2022, June 5th, 2022, Aachen, Germany.

Remote/Digital Talks

3. S. Leonhardt, "The EIT Experience at MedIT Aachen – history and perspectives", **invited keynote lecture**, ICBEM-ICEBI-EIT 2022: International Conference on Bioelectromagnetism, Electrical Bioimpedance, and Electrical Impedance Tomography, Kyung Hee University, Seoul, Korea, June 28-July 1, **2022**, via ZOOM.