

Peter L. Reichertz Institute for Medical Informatics



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- Director, PLRI Campus Braunschweig
- Adjunct Faculty, Hannover Medical School
- Fellow, International Society for Optics and Photonics (SPIE)
- German Representative, International Medical Informatics Association (IMIA)
- Member, World Health Organization (WHO) Roster of Experts for Digital Health

Researcher's Career

- Full Professor of Medical Informatics, Department of Computer Science, TU Braunschweig
- Visiting Faculty, National Library of Medicine, National Institutes of Health, USA
- Associate Professor of Medical Informatics, RWTH Aachen University
- Ph.D. in Computer Science at RWTH Aachen University
- Studies of Electrical Engineering, RWTH Aachen University

Funding

BMBF, BMVI, DFG, EU, Industry, State of Lower Saxony

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Mission Statement

Medical informatics means information engineering applied to health care and the meaningful use of patient health data. In my vision, we shall move Reichertz' paradigm from 1970: "The right information at the right place at the right time" towards: "An accurate forecast for a specific individual longest before the predicted event", i.e. the use of medical informatics to support the transform from curative towards preventive and personalized medicine.

Research

Accident & Emergency Informatics (A&EI): is a novel and trans-disciplinary science of systematically collecting and managing medical data (e.g., electronic health records), as well as sensor data from the human environment (e.g., event data recorder (EDR) such as acceleration sensors in the vehicle). A&EI focusses on syntactic and semantic data integration and analytics in order to forecast, prevent, or lower the impact of adverse health events on the subject.

Private Diagnostic Spaces: We all know EDRs from aviation (flight recorder), but we can consider such systems on various levels:

- Environment (e.g., smart cities)
- Living space (e.g., smart homes)
- Vehicle (e.g., smart cars)
- On-body (e.g., smart wearables)
- In-body (e.g., smart implants)

Smart home and smart cars are private spaces with autonomous power supply, data storage, and processing capacities, and they connect to the Internet. We work on transforming these environments into diagnostic spaces combining continuous environmental, behavioural, and physiological monitoring of individual humans.

International Standard Accident Number (ISAN): When we buy books, the International Standard Book Number (ISBN) is a valuable resource, since it provides a unique identifier disregarding different publishers or editions. Accordingly, the ISAN aims at establishing a unique identifier for adverse events such as accidents and emergencies. We will establish such a token and will use it to establish secure communication between all IT systems in use at different rescue providers:

- Alarm system (e.g., smart home, smart car, smart clothes)
- Rescue team (e.g., street, air, water)
- Health care (e.g., emergency room, general hospital, stroke unit)



The rescue team equipped with tablet computer is provided a floor plan as well as the key code to open the door.



Accident and emergency informatics combines environmental, behavioral, and physiological data for improved health care.

Publications

- Wang J, Warnecke JM, Haghi M, Deserno TM. Unobtrusive health monitoring in private spaces: the smart vehicle. *Sensors*. 2020;20(2447):1-17.
- Deserno TM. Transforming smart vehicles and smart homes into private diagnostic spaces. *Proc ACM APIT*. 2020; p. 165-71.
- Kashif M, Jonas SM, Deserno TM. Deterioration of R-wave detection in pathology and noise: a comprehensive analysis using simultaneous truth and performance level estimation. *IEEE Trans Biomed Eng*. 2017;64(9):2163-2175.
- Jonas SM, Deserno TM, Buhimschi CS, Makin J, Choma MA, Buhimschi IA. Smartphone-based diagnostic for preeclampsia: an mHealth solution for administering the congo red dot (CRD) test in settings with limited resources. *J Am Med Inform Assoc*. 2016;23(1):166-73.
- Deserno TM, Marx N. Computational electrocardiography: revisiting Holter ECG monitoring. *Methods Inf Med*. 2016;55(4):305-11.