

Medical Technology Test and Application Center (METEAN) of the Fraunhofer Institute for Integrated Circuits IIS

Speakers and contact

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Aims and structure

Intention and main focus of METEAN, located at the Faculty of Medicine inside facilities of UK Erlangen, is to combine the research competence in biomedical engineering of the Fraunhofer IIS with the clinical expertise of regional partners from industry, research institutes, and specifically the UK Erlangen, in a synergistic way to exchange ideas for technical solutions considering the medical and clinical needs and hence providing and opening perspectives for innovative and market-oriented products.

Research

Validation of wearables

PI: Dr. N. Lang
 Within a contract research project with an international sports association, we are currently validating five commercial wearables regarding usability and data quality. As reference system we are using wireless BIOPAC systems. The aim is an adequate use of wearables for training optimization in professional sports.

Affective sensing

PI: Dr. N. Lang
 METEAN is currently in the planning phase for a study measuring and analyzing human stress, based on a multimodal system. Main goals are the development of a standardized stress data base as well as the detection of individual human stress parameters. Target markets are medical, automotive, human machine interfaces and robotics.

Sensor based gait analysis for Parkinson patients

PI: Prof. Dr. J. Klucken
 The overall goal is to combine the medical knowledge and technical innovations in the field of gait analysis for Parkinson patients in order to improve diagnosis and therapy. In a current study the gait of Parkinson patients is acquired in METEAN and the data are analyzed.

EIT Health project MoveIT

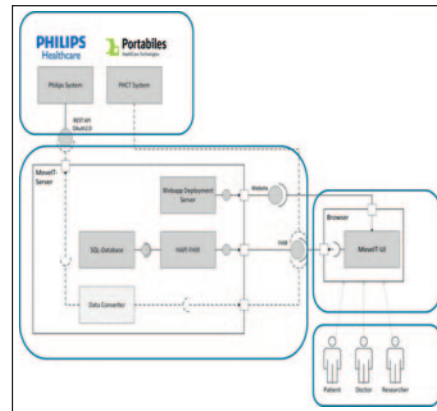
PI: Prof. Dr. J. Klucken
 Parkinson's disease (PD) is a chronic movement disorder characterized by progressive gait impairment, leading to reduced mobility, poor quality of life, and frequent falls. MoveIT improves healthcare for patients via wearable gait and fall sensors enabled as healthcare products by an innovative digital health pathway (DHP). The DHP defines the clinical application of these new technologies for multidisciplinary healthcare using stratified patient cohorts and care networks targeting gait and falls in PD.

IT-infrastructures and medical data communication

PI: C. Weigand
 A close cooperation with the mobile health laboratory of Fraunhofer IIS is planned. The mobile health lab develops infrastructures for medical applications in order to improve communication between physicians, therapists, and patients.

iSTIX / DigImmun

PI: V. Bruns
 Within this project a low cost scanning solution for microscopy („iSTIX“) to digitize histopathologic samples is developed, which can also be used in small and medium-sized pathology departments. This platform is also used in the joint project “DigImmun” for the quantification of the tumor micro environment in the context of immune therapies of gastroesophageal tumors together with the Institute of Pathology as well as Definiens AG. Thus, the goal is to integrated AI-based quantification algorithms in the iSTIX platform. On the other hand workflows for the annotation, visualization, and connectivity e.g. for research and teaching or telepathology with cloud-based platforms shall be realized. Thus, it is planned to evaluate the platform in the environment of the Institute of Pathology and the Division of Nephropathology and to develop and integrate new relevant assisting functionality to support clinical workflows.



The image illustrates the MoveIT server structure that serves patients, physicians, and researchers as means of communication via a standard web browser

ETechPatho (Enabling Technologies for Digital Pathology)

PI: Dr. M. Benz
 In cooperation with the Institute of Pathology, Fraunhofer IIS develops supporting analysis methods for the diagnosis of adeno carcinoma in tissue sections of the colon. These are methods to differentiate different types of tissue or quantify tumor buds automatically. The requirements for those methods are conceived in close cooperation between Fraunhofer IIS and the Institute of Pathology. In addition to that, tissue sections are prepared, digitized, and annotated. New approaches with respect to adaption and explainability of these quantification methods based on deep neural networks are also under current investigation.