MED MEDIZINISCHE FAKULTÄT

Forschungsbericht 2024

Innovation Laboratory for Image Guided Therapy

INNOVATION LABORATORY FOR IMAGE GUIDED THERAPY

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1. LEITUNG

Dr. Axel Boese
Prof. Dr. Michael Friebe

2. FORSCHUNGSPROFIL

Upcoming challenges in healthcare delivery and regional/global unmet clinical needs require new concepts for related purpose-driven research and development to ensure a quick translation back to clinical use.
With the HealthTEC Innovation lab (INNOLAB:IGT) we have established an interdisciplinary development environment with close ties to several clinical users, international partners (Australia, India, Portugal, Italy, Spain, UK, Switzerland, Turkey, USA, Chile), and translation networks.
Our primary focus is on workflow-, and device- innovation for image-guided and minimally invasive therapies, as well as on novel health monitoring approaches.
We are able to IDENTIFY Unmet Clinical Needs, define problem statements and provide IDEAS/INVENTIONS, can validate the prototypes, and have shown to be able to work with partners on IMPLEMENTATION and TRANSLATION. With that approach, we have generated over 40 patents, identified more than 100 needs and created just as many prototypes in the last 5 years.
For that, we provide a fully equipped clinical development environment (diagnostic and minimally invasive therapy systems, robots, 3D printers, electronics / mechanical lab, comprehensive machine learning expertise) and empathetic and knowledgeable development staff.
Engineering students (biomedical, electrical, computer science, and mechanical) and clinical students learn to work in a focused and interdisciplinary innovation environment from identification all the way to a potential technology transfer with the clinical user and at the same time stimulate start-up activities in this area.
We also know the regulatory environment and the economic realities of bringing innovation to the clinical markets.

3. SERVICEANGEBOT

The INKA Innovation Lab supports innovators in the realization of their ideas.
We provide application-driven research close to medical needs. Our strengths are ideation, innovation, prototyping and testing of new solutions and products with medical professionals involved. With our interdisciplinary and international team, we operate a fully equipped clinical development environment including diagnostic and minimally invasive therapy systems, robots, 3D printers, phantoms / electronics / mechanical lab, engineering, machine learning and data processing expertise and empathetic and knowledgeable development staff. We can show expertise in regulatory affairs and the economic realities supporting you to bring innovation to the clinical markets. We look forward to working with you! Please check: www.inka-md.de or contact inka@ovgu.de

4. METHODIK

We work based on an adapted Stanford Biodesign approach to **Identify** clinical needs, **Ideate** solutions and **Implement** these solutions for transfer to the market.

5. FORSCHUNGSPROJEKTE

Projektleitung: Dr.-Ing. Axel Boese
Projektbearbeitung: Prof. Dr. Dr. h.c. Roland S. Croner, Dr. Cora Wex
Förderer: Land (Sachsen-Anhalt) - 01.07.2021 - 30.06.2024

InnoMedTec - "Nachhaltige Etablierung einer Arbeitsgruppe "Innovationen in der Medizintechnik" an der Medizinischen Fakultät Magdeburg zur Digitalisierung der Medizintechnik"

Ziel von InnoMedTec ist es, klinisch relevante regionale und global verwertbare Ergebnisse zu generieren, die durch strategische Erarbeitung von Vorarbeiten sowohl den Wissenschaftsstandort, sowie durch eine entsprechende digitale Produkt-/Marktorientierung und Transfer auch den Wirtschaftsstandort stärken. Weiterhin dienen die zu erwarteten Ergebnisse zur Etablierung und Optimierung der flächendeckenden medizinischen Versorgung in Sachsen-Anhalt durch den Einsatz digitaler Diagnose- und Präventionsmethoden.

Projektleitung: Prof. Dr. Michael Friebe
Projektbearbeitung: MSc. Holger Fritzsche
Kooperationen: Siemens Healthineers, Innovation Think Tank, Prof. Haider
Förderer: Industrie - 18.12.2020 - 31.12.2024

INNOVATION THINK TANK - Siemens Healthineers

We have been certified as a SIEMENS HEALTHINEERS INNOVATION THINK TANK offering healthcare innovation programs and being part of the global network of think tanks. Together with partners from HEALTHINEERS we are addressing workflow and dedicated innovation needs and supervise graduate and doctoral students.

6. VERÖFFENTLICHUNGEN

BEGUTACHTETE ZEITSCHRIFTENAUFSÄTZE

Kaabachi, Syrine; Illanes, Alfredo; Esmaeili, Nazila; Sühn, Thomas; Spiller, Moritz; Friebe, Michael; Hansen, Christian; Boese, Axel
Assessing underlying pulsatile structures with laparoscopic tools using proximal vibroacoustic sensing
Current directions in biomedical engineering - Berlin : De Gruyter, Bd. 10 (2024), Heft 1, S. 37-40

Mahmeen, Mohd; Mehdi, Syed Ali; Friebe, Michael; Pech, Maciej; Haider, Sultan
Mapping and deep analysis of hospital radiology department to identify workflow challenges and their potential digital solutions
Journal of health management - Thousand Oaks, Calif. : Sage Publications, Bd. 26 (2024), Heft 4, S. 581-593
[Imp.fact.: 1.0]

Pagallo, Ugo; O'Sullivan, Shane; Nevejans, Nathalie; Holzinger, Andreas; Friebe, Michael; Jeanquartier, Fleur; Jean-Quartier, Claire; Miernik, Arkadiusz
The underuse of AI in the health sector - opportunity costs, success stories, risks and recommendations
Health and Technology - Berlin : Springer, Bd. 14 (2024), Heft 1, S. 1-14
[Imp.fact.: 3.1]

Spiller, Moritz; Esmaeili, Nazila; Sühn, Thomas; Boese, Axel; Turial, Salmai; Gumbs, Andrew A.; Croner, Roland; Friebe, Michael; Illanes, Alfredo
Enhancing veress needle entry with proximal vibroacoustic sensing for automatic identification of peritoneum puncture
Diagnostics - Basel : MDPI, Bd. 14 (2024), Heft 15, S. 1-14, Artikel 1698, insges. 14 S.
[Imp.fact.: 3.0]

Sühn, Thomas; Spiller, Moritz; Esmaeili, Nazila; Costa, Maximilian; Lohmann, Christoph H.; Friebe, Michael; Illanes, Alfredo; Boese, Axel
Instrument interactions as source of information in robot-assisted surgery
Current directions in biomedical engineering - Berlin : De Gruyter, Bd. 10 (2024), Heft 1, S. 85-88

Urrutia, Robin; Espejo, Diego; Sühn, Thomas; Guerra, Montserrat; Fuentealba, Patricio; Poblete, Victor; Boese, Axel; Illanes, Alfredo
Variational autoencoder feature clustering for tissue classification in robotic palpation
Current directions in biomedical engineering - Berlin : De Gruyter, Bd. 10 (2024), Heft 1, S. 89-92

NICHT BEGUTACHTETE ZEITSCHRIFTENAUFSÄTZE

Friebe, Michael; Boese, Axel; Castro, Nathan; Hutmacher, Dietmar; Pashazadeh, Ali
Personalized 3D printed patches for fast and safe radiation therapy of non melanoma skin cancer
Preprints - Basel : MDPI AG . - 2024, insges. 9 S.

ABSTRACTS

Davaris, Nikolaos; Pickert, Paul; Esmaeili, Nazila; Illanes, Alfredo; Boese, Axel; Friebe, Michael; Arens, Christoph
Perpendicular vascular changes as an indicator of malignancy in vocal fold lesions
Laryngo-Rhino-Otologie - Stuttgart [u.a.]: Thieme, Bd. 103 (2024), Heft S 02, S. S151
[Imp.fact.: 0.9]

Gschwend, Gabriel; Illanes, Alfredo; Esmaeili, Nazila; Sühn, Thomas; Spiller, Moritz; Boese, Axel; Fuentealba, Patricio; Hoffmann, Thomas K.; Schuler, Patrick
Verbesserung der Genauigkeit von Lumbalpunktionen mithilfe vibroakustischer Exzitationen
Laryngo-Rhino-Otologie - Stuttgart [u.a.]: Thieme, Bd. 103 (2024), Heft S 02, S. S23-S24
[Imp.fact.: 0.9]

Schwab, Roland; Zschenderlein, Nike; Boese, Axel; Behme, Daniel
Feasibility of using angioscopy to visualize the internal vessel wall of the internal carotid artery
Journal of neuroInterventional surgery - London : BMJ Journals, Bd. 16 (2024), Heft Suppl 2, S. A122, Artikel P175
[Imp.fact.: 4.5]