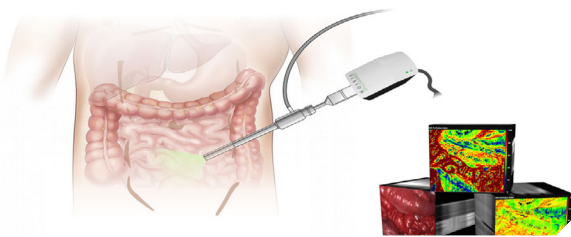


HIGHLIGHT

ICCAS' STATUS SEMINAR | March 10, 2022

For a second consecutive year, ICCAS' Status Seminar was held virtually with more than 100 participants on March 10, 2022. Despite 2021 being another challenging year overshadowed by the COVID-19 pandemic, ICCAS' research teams were able to successfully complete six projects, while also kick-starting eight new ones with public and industrial funding amounting to more than 2.3 million euros. The BMBF-funded joint project MR-Biopsy by our research group on MR-guided Interventions under the scientific leadership of Prof. Dr. Andreas Melzer, in collaboration with the University of Leipzig Medical Center, University Göttingen and led by the industry partner EPflex Feinwerktechnik GmbH, is among the successfully completed projects. A novel design of an MR compatible flexible biopsy forceps and the related clinical workflow for MRI-guided endomyocardial biopsy were developed within the project, both of which now are going to be tested in preclinical studies. At the same time, within the scope of the LYSIS project under the scientific leadership of PD Dr. Claire Chalopin, an algorithm for automatic tissue classification using Artificial Intelligence (AI) approaches was successfully integrated into the endoscopic Hyper Spectral Imaging (HSI) system developed by our industrial partner Diaspective Vision GmbH. The TIVITA® Mini system was certified for the clinical use and a prototype is currently being evaluated at the hospital on patients during operations.



Intraoperative Laparoscopic HSI system. Diaspective Vision©

Meanwhile, new projects have been launched with focus on applications of AI, Big Data and 5G and 6G telecommunication standards in the medical-technical field. For instance, the GAIA-X Digital Patient Model (DPM) project under the scientific leadership of Prof. Dr. Thomas Neumuth aims to integrate the technology of a DPM based on the concept of a digital twin into the GAIA-X ecosystem and, thereby, share pseudonymised population-based



The digital twin within the GAIA-X ecosystem. GAIA-X©

data, trained models and analysis modules between institutions and countries inside the EU. Finally, we are excited to announce that the PostStroke-Manager concept by the Biomedical Data Analysis group under the scientific leadership of Prof. Dr. Galina Ivanova in collaboration with the University of Leipzig Medical Center is undergoing a feasibility study. More on this in the following article.

RESEARCH & PROJECTS

POSTSTROKE MANAGER: AFTERCARE CONCEPT PUT TO THE TEST IN A FEASIBILITY STUDY

The development phase of the PostStroke-Manager project has been completed successfully, and as of this January, a feasibility study on the applicability of the aftercare concept has been underway. The PostStroke-Manager is the first digitally supported solution Germany-wide using modern eHealth and mHealth technologies that focuses on the care needs of stroke patients. It is a hybrid, patient-oriented, digital system intended to enable coordinated preventive long-term care for stroke patients in the difficult time after the acute event. The developed system integrates the different groups involved in the aftercare into one platform and consists of an app, portals for the treatment providers as well as assistance by so-called stroke pilots. A unique feature of the PostStroke-Manager is its multifaceted deployability: It can be used in hospitals, in the practices of physicians, and most importantly, in the patients' home environment.

Prof. Dr. Galina Ivanova manages the project on ICCAS' side. Further project leaders are Prof. Dr. med. Joseph Claßen - Director of the Clinic and Polyclinic for Neurology at University of Leipzig Medical Center) and Prof. Dr. med. Dominik Michalski - Senior Physician of the Stroke Unit at University of Leipzig Medical Center.



PostStroke-Manager © Patient's Kit

NEUROMODULATION THERAPIES VIA FOCUSED ULTRASOUND FOR RARE NEUROPSYCHIATRIC DISORDERS

The research group on Image-Guided Focused Ultrasound under the project lead of Prof. Andreas Melzer is kick starting a new project dubbed 3MP FUS. Herein, ICCAS will be collaborating with the Fraunhofer Institute for Biomedical Engineering (IBMT), the Max Planck Institute for Human Cognitive and Brain Sciences, and industrial partners Localite GmbH and MRI-STaR GmbH. The project is funded by the Federal Ministry of Education and Research

(BMBF) and aims to further develop and test a multi-modal, multi-parameter, platform-independent focused ultrasound system (3MP FUS) for neuromodulation in dystonia and rare forms of Parkinson's disease. For this purpose, 3MP FUS will be integrated with MRI and PET/MRI and, thus, be able to precisely target prespecified brain regions and alter their function.

EVALUATING CLINICAL NETWORKS VIA 5G

The KliNet5G consortium, to which ICCAS under the leadership of Prof. Neumuth is a technology partner, will evaluate the feasibility of a 5G-based network infrastructure with medical technology, biosensor and clinic logistics applications based on OpenRAN in clinics as part of the lead technology program 5G Campus Networks sponsored by the Federal Ministry for Economic Affairs and Climate Action (BMWK). Adopting OpenRAN has the advantage of greater technological sovereignty and flexibility in the selection and deployment of network components. The use cases within the project include the tracking of medical equipment on site, wireless transmission of video data in compliance with medical requirements, biosensor technology for location-independent patient monitoring, and wireless control of medical devices with real-time requirements. The cases have been carefully selected to represent a broad spectrum of 5G performance parameters: from high bandwidth, to low latency, to high subscriber numbers and very low power consumption.



Nataliia Mysik, Adobe Stock

PUBLICATIONS

ICCAS' ANNUAL REPORT PUBLISHED



We present our research work and results from the past year in the latest ICCAS 2021 report now available in English online. It introduces the individual project activities, reports on our contributions to numerous leading symposia spanning three continents over the last year, and presents our highlights for 2021.

[Link to annual report](#)

[All publications](#)

JOB OFFERS

Please find our vacancies at:

[Current vacancies](#)

PEOPLE

MARIANNE MAKTABI ADMITTED TO THE DFG-PROGRAM SUPPORTING YOUNG RESEARCHERS

The 10th edition of the DFG-Program supporting aspiring scientists is dedicated to the topic of AI in Radiology and aims to form a transdisciplinary training platform for scientists from the fields of medicine, especially radiology, nuclear medicine and pathology, as well as informatics. Our research fellow Dr. Marianne Maktabi, whose work has been concentrated on tissue identification and semi-automatic decision-making processes using HSI for minimally invasive surgery with special focus on the applications for colorectal carcinoma, has been selected into the esteemed program. Within its scope, she will receive targeted support towards drafting her own DFG funding proposal.

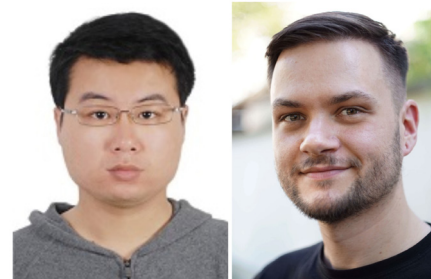


SHAONAN HU AND ALEXANDER OESER OBTAIN DOCTORATE DEGREES

Congratulations go to our guest researcher Shaonan Hu and our research associate Alexander Oeser for completing their studies towards obtaining the academic degree of Dr. rer. med. at the Faculty of Medicine of Leipzig University. Hu's dissertation topic deals with the potential of FUS-induced cavitation to sensitize cancer cells to other treatment modalities like radiation therapy, while Oeser's dissertation addresses the topic of distributed knowledge modelling and integration of model-based beliefs into the clinical decision-making process.

[Link to Hu's thesis](#)

[Link to Oeser's thesis](#)



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