



Q2/2024 ICCAS NEWSLETTER



Dear Reader,

we are pleased to present you the latest newsletter of ICCAS for Q1 2024.

Various conferences, events, and presentations attended are briefly presented, as are new publications and personnel achievements. We hope you enjoy reading our update and find interesting information.

Andreas Melzer & Thomas Neumuth

#TECHNOLOGIES_AND_SCIENCE_PRESENTATION

- · ICCAS @ DGE-BV
- · ICCAS @ DMEA
- · ICCAS @ ANALYTICA
- · ICCAS @ HM24
- · ICCAS @ DCK 2024
- · ICCAS @ DGINA
- · ICCAS @ Deutscher Röntgenkongress
- · ICCAS @ IEEE 6G SUMMIT
- · ICCAS @ FUTURE OF HEALTH EXPERIENCE
- · ICCAS @ MACHN FESTIVAL
- ICCAS @ DIGITAL FORUM SACHSEN
- · ICCAS @ EAES CONGRESS
- · ICCAS @ Innovationstag Mittelstand
- · ICCAS @ MEDTEC 2024
- · ICCAS @ CARS CONGRESS
- · ICCAS @ ICCA STROKE
- ICCAS @ HAMLYN SYMPOSIUM 2024

#PROJECT WORK

- Working meeting of the RescEU project
- ICCAS EXPLORING INNOVATIVE BIOMEDICAL AND EHEALTH TECHNOLOGIES IN HOUSTEN

#PUBLICATIONS

- ICCAS DEVELOPS TRAUMAFLOW: DECISION SUPPORT SYSTEM FOR SHOCK ROOM TREAT-MENT OF SEVERELY INJURED PATIENTS
- ICCAS DEVELOPS AR-SUPPORTED THER-MOGRAPHY SYSTEM FOR RECONSTRUCTIVE SURGERY
- ICCAS DEVELOPS ELECTRONIC PATIENT DATA SYSTEM FOR THE INTEGRATION OF PPPM IN EMERGENCY MEDICINE DURING DISASTERS

#MISCELLANEOUS_FROM_ICCAS

- · ICCAS STATUS SEMINAR
- DELIVERY OF THE SOLA MR TOMOGRAPH
- Pupils from the Montessori School VISIT ICCAS
- MD-COMP WHITEPAPER PUBLICATION

#TECHNOLOGIE_AND_SCIENCE_PRESENTATIONS

PRESENTATIONS AND CONFERENCES IN Q2

April 3th-5th, 2024 - Berlin ICCAS @ DGE-BV

The DGE-BV Congress 2024, organised by "Deutsche Gesellschaft für Endoskopie und bildgebende Verfahren e.V.", took place in Berlin under the motto "Innovation and Progress in Endoscopy and Imaging Diagnostics". The aim of the congress was to present and discuss the latest innovations, technological breakthroughs and research findings in endoscopy and imaging procedures. The event is a central platform for the exchange of knowledge and offers exceptional opportunities for networking and professional development. In addition to theoretical insights, numerous practical workshops and sessions were offered, giving participants direct access to the latest devices and technologies. Andreas Melzer opened the event with a few words of welcome and chaired the session: "ALL IN: Endoscopist meets Engineer."



Andreas Melzer hold a speech by the opening of the event.

April 9th-11th, 2024 - Berlin ICCAS @ DMEA

DMEA Messe 2024 in Berlin is recognised as one of the world's leading digital health events and a key event for healthcare professionals and IT experts dedicated to digital transformation in the healthcare sector. The event offers a unique platform for the exchange of knowledge, experience and the latest technological developments that are revolutionising the healthcare sector.

ICCAS once again took part in this year's DMEA in

the Berlin exhibition halls and presented its research findings at several stands, while our team also provided insights into the ambulance of the future. At the OR.NET e.V. stand and the VDE stand, visitors were able to find out about the new 6G standard. The 6G-Health project aims to develop future medical technology applications with the help of 6G components and thus ensure the networking of different medical technology systems. At the Frauenhofer Institute stand, one of our employees presented the possibilities of LiFi (=light fidelity, a communication technology in which light is used for data transmission) for communication between medical devices as part of the 5G Compass project.



Our ICCAS team presents the ambulance of the future at the $\ensuremath{\mathsf{DMEA}}.$

April 9th-12th, 2024 - Munich ICCAS @ Analytica

The world's leading trade fair Analytica takes place every two years in the exhibition halls in Munich and impressively demonstrates the direction in which the laboratory sector is developing. As an important industry gathering, it brings together and presents the entire spectrum of topics relating to innovative laboratory techniques, pioneering biotechnologies and ground-breaking research specialisms.

This year's "Finance Days", organised by the Life Sciences Platform, is all about growth capital for the life sciences sector. Discussions centred on framework conditions, location factors and the increasing importance of ESG criteria in growth financing. ICCAS employee Alexander Oeser gave a pre-

sentation on the topic of artificial intelligence in clinical decision support. Together with the previous presentation by Prof. Dr Dr Torsten Haferlach from the Munich Leukaemia Laboratory (MLL), the participants were given an insight into specific applications of Al-supported diagnostics, therapy evaluation and patient monitoring.

April 22th-26th, 2024 - Hannover ICCAS @ HM 24

This year's Hannover Messe took place from 22th to 26th April and was opened by German Chancellor Olaf Scholz and Norwegian Prime Minister Jonas Gahr Støre. As Norway was this year's partner country, Mr Scholz gave a speech entitled "Pioneering the Green Industrial Transition", highlighting German-Norwegian cooperation in the history of energy and industry. Norway is regarded as a pioneer in sustainable energy production and the use of renewable energies and offers new solutions in these areas. The trade fair includes the core topics of artificial intelligence (AI) and machine learning, which are at the centre of this year's event. At the Hannover Messe, ICCAS employees presented the KliNet5G project, which is researching the feasibility of a purely 5G-based network infrastructure based on OpenRAN in hospitals. Industry partners of the project demonstrated a first practical use case with 5G mobile radio networked medical devices at the trade fair. Visitors to the trade fair were also able to obtain further information on the content of the project, such as our hospital guidelines for campus networks.

April 24*-26*, 2024 - Leipzig ICCAS @ DCK 2024

The 141st "Deutscher Chirurgie Kongress" in Leipzig is a key event for surgeons, medical professionals and researchers to discuss the latest developments and techniques in surgery. The programme includes specialist lectures, live operations, interactive workshops as well as poster and research exhibitions, which are intended to promote exchange across specialist boundaries. The aim of the congress is to improve surgical

practice through further training, research and interdisciplinary collaboration and to inspire young doctors for surgery.

May 02nd-04th, 2024 - Augsburg ICCAS @ DGINA

This year's "Jahrestagung Deutsche Gesellschaft Interdisziplinäre Notfall- und Akutmedizin" took place at Park Augsburg and focussed on topics relating to emergency medicine. As in many other areas, the focus was on digitalisation and how new technologies can be effectively integrated into the daily routine of emergency departments. This should be used to reduce or even completely eliminate existing problems in emergency medicine. These include, for example, difficulties in the flow of emergency treatment, too few emergency departments in general and very little coverage in rural areas in particular.

May 08th-10th, 2024 - Wiesbaden ICCAS @ Deutscher Röntgenkongress

This year, the "Deutscher Röntgenkongress" is being held for the 105th time, together with the "Österreichischen Röntgengesellschaft" under the motto "Radiology in Transformation". The congress focussed on the role of AI in the exchange of information and communication and how precisely this new technology works. The congress offered participants a range of activities, such as interactive sessions, discussions and an industry exhibition. The focus of the event was on patient-centred radiology and multidisciplinary collaboration. The aim over the next few years is to further develop radiology as an innovative, networked speciality. Andreas Melzer attended the event to hold cooperation talks with various players in the industry, including Philips.

May 13th-14th, 2024 - Dresden ICCAS @ IEEE 6G Summit

The IEEE 6G Summit took place on 13th to 14th May 2024 in the exhibition halls in Dresden, where industry leaders, academic pioneers and technology enthusiasts came together to

discuss the latest technologies. There was also the opportunity to discover trends and the latest business perspectives that will shape the communications landscape in the near future. To mark the occasion, Thomas Neumuth gave a presentation entitled "The Role of 5G and 6G in Shaping Modern Medicine", in which he explained the role that 5G and 6G technology is already playing in the medicine of tomorrow and the extent to which its influence will develop in the coming years.

May 15th-16th, 2024 - Leipzig ICCAS @ Future of Health Experience

At FHX24 (Future Health Experience), which took place on 16th May 2024 at Media City in Leipzig, ICCAS presented a prototype for multiuser augmented reality applications in medicine developed as part of the MOMENTUM project. Participants took part in a collaborative session in which they assessed an injury to a torso and identified secondary injuries and treatment solutions. This pioneering technology is still in development and while current augmented reality headsets are large and clunky, in the future they will be miniaturised and allow seamless integration into existing workflows.

The ICCAS team at FHX24, presented this AR solution to demonstrate the feasibility of such tools for medical practice. Their efforts brought together successful partners from medicine, research and industry and fostered collaboration with ICCAS experts.

May 29th-30th, 2024 - Leipzig ICCAS @ MACHN Festival

The MACHN Festival took place on 29th and 30th May in Leipzig's Baumwollspinnerei. The event offered companies, founders, start-ups, developers, creatives, institutions and projects from Central Germany a platform for exchanging knowledge. Numerous networking events and training sessions gave participants the opportunity to discuss the latest innovations. ICCAS was on site with its research ambulance and offered participants a glimpse into

the car of tomorrow. The prototype for multi-user augmented reality applications in medicine, which was developed as part of the MOMENTUM project, was also presented. Alexander Oeser also gave a presentation on site and explained how data-driven medicine will usher in the next stage of healthcare.



Ivan Matyash presents the prototype for multi-user augmented reality applications in medicine at the MACHN Festival .

June 10th, 2024 - Löbau ICCAS @ Digital Forum Sachsen

The "Digital Forum Sachsen" is one of the largest specialist conferences and networking events on the topic of digitalisation in the Free State of Saxony. It took place for the 6th time this year on 10th June at the Löbau Exhibition and Event Park and is organised by the Saxon State Ministry of Economic Affairs, Labour and Transport. The event was opened by State Secretary Ines Fröhlich, District Administrator Dr Stephan Meyer and the Mayor of Löbau Albrecht Gubsch. The forum offers participants in the event the opportunity to find out about the digitalisation activities of the Free State of Saxony and to take part in the interdisciplinary exchange of knowledge. In addition, the exhibit world will show how innovative ideas can create solutions for the issues of tomorrow. The aim of the forum is to accelerate the digital transformation in the region by creating an environment that promotes innovation and strengthens cooperation between nies, research institutions and the government. We took part in the event and offered interested

parties the opportunity to find out more about the ICCAS research vehicle and ask our employees questions. Participants also had the opportunity to view the ambulance from the inside and take a look at the latest technologies.



The ambulance of the future was presented at the Digital Forum Sachsen

June 10th, 2024 - Maastricht, Netherlands ICCAS @ EAES Congress

The 32nd International Conference of the European Association for Endoscopic Surgery (EAES) took place from 11th to 14th June 2024 at MECC Maastricht, The Netherlands. This important event brings together professionals from endoscopic surgery and related disciplines to discuss the latest developments, research findings and innovations.

In addition, masterclasses on endoscopic imaging, image-guided surgery, Al and writing a scientific article were offered. One of the most important topics at the EAES Congress was sustainability, as the healthcare sector is responsible for around 8% of total greenhouse gas emissions in Europe. In order to reduce the impact, the building structure and equipment in clinics should be adapted and improved in future. Andreas Melzer attended the event to find out about the latest developments in endoscopic surgery.

June 13th, 2024 - Berlin ICCAS @ Innovationstag Mittelstand

The "Innovationstag Mittelstand" of the Federal Ministry for Economic Affairs and Climate Protection (BMWK) took place on 13th June 2024 in Berlin Pankow. Dr Robert Habeck met with SMEs, innovative start-ups and their partners to discuss their pioneering products and services. Around 300 exhibitors presented their innovations, which were developed with BMWK funding. The event offered advice on funding programmes, a matchmaking platform for collaborations and a diverse stage programme. Visitors were able to find out about technological developments and international co-operations free of charge.

June 18th-20th, 2024 - Stuttgart ICCAS @ MedTec 2024

The MedtecLIVE fair took place from 18th to 20th June 2024 in Stuttgart and brought together the European medical technology industry. The focus was on innovative manufacturing processes, materials and services as well as personal networking. The fair provided a platform for exchanging ideas with specialists and exploring new trends and technologies such as 3D printing, Al and automation. A diverse programme of presentations and workshops promoted knowledge transfer and networking. ICCAS employee Tobias Pabst gave a presentation on 6G technology, which will enable new applications such as tele-surgery, tele-monitoring, tracking in emergency services, networked implants and robotics in the future. It is set to replace the existing 4G/5G networks in the coming years. The presentation explained the technoloaical development, promising applications and how manufacturers and suppliers can make networked medical devices safe and compliant.

June 18th-22th, 2024 - Barcelona, Spain ICCAS @ CARS Congress

The CARS Congress (Computer Assisted Radiology and Surgery) took place in Barcelona from 18th to 21th June 2024, marking the 38th edition

of this prestigious international event. The congress brings together scientists, engineers and doctors to present and discuss the latest innovations in medical informatics and imaging technology. All in the digital operating theatre, model-guided medicine, image- and model-guided interventions are among the main topics of the congress. ICCAS is participating in this year's CARS Congress with a large number of contributions.

Andreas Melzer was part of the programme committee of the event and took part in the session: Medical Imaging in which he gave a lecture on the topic: "Classification of peritoneal lesions and detection of peritoneal metastasis using in vivo laparoscopic hyperspectral imaging". Our employees Max Rockstroh, Hannes Köhler, Eric Schreiber, Daniel Schneider and Michael Unger also took part in the event with their presentations.



Max Rockstroh, Michael Unger, Eric Schreiber and Hannes Köhler (f.l.t.r.) at the CARS Congress in Barcelona.

June 21th-22th, 2024 - Frankfurt on the Main ICCAS @ ICCA Stroke

The ICCA Stroke 2024 took place from 21th to 22th June 2024 in Frankfurt on the Main. The two-day conference is a leading event in the field of acute stroke interventions and carotid stent implantation. The conference was held at the Congress Center Frankfurt and included a variety of programme items, including interdisciplinary lectures by leading experts, live demonstrations and recorded cases, practice-

oriented workshops and interactive discussions. The conference is aimed at interventionalists, neurologists, vascular surgeons and other medical professionals involved in stroke treatment. It provides a valuable platform for knowledge exchange and education to improve the quality of care for stroke patients worldwide. Andreas Melzer took part in the lecture "Acute Stroke" as a panellist and also presented the latest advances in MR-guided intervention in his lecture.

June 25th-28th, 2024 - London, England ICCAS @ Hamlyn Symposium 2024

The Hamlyn Symposium on Medical Robotics 2024 took place from 25th to 28th June 2024 at the Royal Geographical Society in London. Its theme is "Al Driven Health: Transforming Care" and offers a platform for the exchange and networking of experts from the fields of medical robotics, surgery and engineering. As in previous years, a highlight of the event is the Surgical Robot Challenge 2024, where innovative projects and technologies were presented. The symposium also offered various sessions in which topics such as smart devices and systems, continuum and fibre robotics and human robotics interaction were discussed. Andreas Melzer took part in the organisation of the workshop: "Endoluminal robots: a journey from unmet medical needs, design challenges, regulatory bodies, and commercial opportunities" and took on the role of co-chair. He gave a presentation on the topic of "Imging guided robotics, update and regulatory requirements"

May 02nd-03rd, 2024 - Leipzig Working meeting of the RescEU project

The working meeting of the RescEU project took place at ICCAS at the beginning of May, at which the technical implementation of the education and training concept was worked on together with Johanniter-Unfall-Hilfe (RescEU project coordination) and the companies KSK and Krisenplaner. In future, the administration of the training, instruction and training of potentially over 3,000

PROJECTS AND RESULTS IN Q2

RescEU emergency personnel is to be realised using the elearning platform Moodle. With experts specialising in the content aspect of the project, the organisation and configuration of teaching at ICCAS via Uni-Moodle was examined and the necessary settings and configurations for RescEU were derived from this. ICCAS acted in an advisory capacity as experts for elearning content. In the longer term, the content of the EOS software is also to be integrated as part of the training concept.

June 09th-16th, 2024 - Housten, North America ICCAS exploring innovative biomedical and eHealth technologies in Housten

From 09th to 16th June 2024, our employee Stefan Bohn was in Houston/Texas to visit the Texas Medical Center, the Rice360 Institute for Global Health Technologies, the CUBIO Innovation Center, the Texas University of Engineering Medicine EnMed as well as networking events with local representatives and business owners in the field of life sciences and digital health. The Houston TX metropolitan area is to be strategically established as a major centre for new biomedical and eHealth processes on the south coast of the USA. alongside the west and east coasts. The Houston-Leipzig delegation, consisting of representatives from politics, business development and representatives from science and industry, exchanged valuable information on the status of research and development of new medical procedures, IT and laboratory solutions as well as the establishment of new structures and business areas in the healthcare sector. Business contacts and scientific collaborations were initiated. Houston is known as a NASA location and discussions were held with engineers on possible cooperation in the development of bioengineering tasks for future space missions.

PUBLICATIONS IN Q2

ICCAS develops TraumaFlow: decision support system for shock room treatment of severely injured patients

Neumann J, Vogel C, Kießling L, Hempel G, Kleber C, Osterhoff G, u. a. TraumaFlow-development of a workflow-based clinical decision support system for the management of severe trauma cases. Int J Comput Assist Radiol Surg. 30. Mai 2024;

The publication describes the development and evaluation of TraumaFlow, a computer-based decision support system for the treatment of severely injured patients in the emergency department trauma room. The treatment of severely injured patients requires quick and critical decisions that place a heavy burden on the team and equipment. Computer-based tools are particularly valuable for the education and training of medical staff. The system was developed according to the cABCDE scheme and implemented in a workflow management system using BPMN 2.0. It supports the registration and coordination of activities as well as the recommendation of diagnostic and treatment measures.

ICCAS develops AR-supported thermography system for reconstructive surgery

Unger M, Hänel A, Chalopin C, Halama D. Design and evaluation of an AR-based thermal imaging system for planning reconstructive surgeries. Int J Comput Assist Radiol Surg. 24. Mai 2024;

Thermography can be used for the non-invasive detection of blood vessels in the skin, but until now there has been a lack of user-friendly implementation on the patient. A new system projects this thermal imaging information directly onto the patient using augmented reality (AR), which should make it easier to use. A system that combines a thermal imaging camera with a Microsoft HoloLens has been developed for planning in reconstructive surgery.

RGB, depth and thermal imaging cameras capture the scene and reconstruct it in real time. An active calibration target was developed to register the different cameras and the AR device, while a Vuforia marker anchors the hologram in virtual space. Although the calibration target provides a simple method of registering the cameras, the inside-out tracking of the HoloLens in combination with the Vuforia marker is not yet precise enough for clinical use.

ICCAS develops electronic patient data system for the integration of PPPM in emergency medicine during disasters

Gaebel J, Schreiber E, Neumuth T. The Emergency Medical Team Operating System — a vision for field hospital data management in following the concepts of predictive, preventive, and personalized medicine. EPMA Journal [Internet]. 22. April 2024 [zitiert 15. Mai 2024];

The integration of predictive, preventive and personalised medicine (PPPM) in emergency medicine is crucial in sudden onset disasters (SODs). A new electronic patient record system for emergency teams optimises digital health management in crisis situations through predictive analytics, preventive guidelines and personalised treatment plans. The system closes gaps in current emergency strategies and was developed with European emergency teams. It improves patient management and enables predictive analyses to anticipate needs. Future investments in the development of such systems and clinical processes are necessary to establish PPPM in disaster medicine.

MISCELLANEOUS IN Q2

April 18th, 2024 - Leipzig ICCAS Status seminar

This year's ICCAS status seminar took place on 18th April 2020 as an online event, at which numerous guests were invited, including the board members

and members of the ICCAS advisory board, to be informed about the current research projects and innovations of ICCAS. Andreas Melzer and Thomas Neumuth discussed the future challenges in the fields of computer-assisted surgery, image-guided interventions and model-based medicine. After the official part of the event, participants were taken on a demo tour of the various research areas. The demo operating theatre, the KAIT project, the RTW and the HSI project, among others, were presented. The members of the advisory board then met to discuss the scientific orientation of the institute and the main areas of research.

May 14th, 2024 - Leipzig Delivery of the Sola MR Tomograph



The MR tomograph in its new place in the HF cabin at Leipzig University Hospital.

For the 3MP-FUS project funded by the Federal Ministry of Education and Research, the Sola 1.5 T MR tomograph ordered from Siemens Healthineers was delivered to the HF cabin in the backyard of the Red House at Leipzig University Hospital AöR on 14th May 2024.

The state-of-the-art MRI scanner will be available to the ICCAS Image-guided Focused Ultrasound research team, headed by Prof. Dr Andreas Melzer, for research work on the project. Together with Localite GmbH, Fraunhofer-Gesellschaft IBMT, Max Planck Institute MPI and MRI-STAR, ICCAS is working on using focussed multi-modal-multi-parametric ultrasound under MRI control for neuromodulation and research into innovative

therapies for rare neuropsychiatric diseases.

May 16th, 2024 - Leipzig Pupils from the Montessori School visit ICCAS

As part of the Children's University at Leipzig University, Prof Thomas Neumuth and other ICCAS employees have already given lectures for interested children in previous years.

On 16th May 2024, a class from the Montessori primary school "Die Regenbögen" in Leipzig visited us. They were given a brief insight into our research at four stations and showed great interest in our work. Whether in the demo operating theatre, with hyperspectral imaging, the robot dog or the robot hand. The children took a very close look at everything and wanted to get to the bottom of things with numerous questions.

Perhaps this has laid the foundations for a career as a researcher? In any case, we would be delighted if we have contributed to this.



Hannes Köhler gave the children a demonstration of the demo OP

June 05th, 2024 - Leipzig MD-Comp Whitepaper Publication

The VDE published on 05th June 2024 a new white paper with the title "MD Comp - A practical framework to integrate non-medical devices and medical devices in a compliant way" published by the VDE Connected Health Technical Committee.

In it, the VDE presents the MD Comp concept, which enables the integration of non-medical devices into medical systems. Through "compliance by design", regulatory requirements are incorporated into product development at an early

stage to ensure safe and compliant integration. This improves market acceptance and avoids ambiguities in the demarcation of medical device accessories. Manufacturers and operators should apply MD Comp at an early stage. The approach has already been applied to the IEC 60601-1 standard and is to be expanded further. MD Comp was developed as part of the "Connected Health" initiative and the 6G-Health project.

June 28th, 2024 - Leipzig Visit from almost 40 students from Köthen

On 28th June, a group of almost 40 students from Anhalt University of Applied Sciences, led by Prof. Dr Marianne Maktabi, visited the ICCAS. The aim of the visit was to familiarise themselves with the research areas at ICCAS and find out about current developments in research. The students were given comprehensive insights into three central stations. The DemoOR: Here, the application of the latest computer-aided techniques in the operating theatre was demonstrated. The ICCAS research ambulance was also presented. This station focussed on the real-time monitoring and processing of medical data. And finally, the robotics station, which focussed on the role of robotic systems in surgery and their future applications.

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