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Bern Center for Artificial Intelligence in Medicine

The University of Bern and the Inselspital, Bern University Hospital, are founding a "Center for Artificial Intelligence in Medicine" (CAIM) that combines cutting-edge research, engineering and digitalization. Using artificial intelligence it will develop new medical technologies to enable tailor-made and efficient patient care. Partners of the new center are sitem-insel, the Swiss Institute for Translational and Entrepreneurial Medicine, and the University Psychiatry Services (UPD).

Even now health care systems generate more digital data than medical professionals can evaluate. However with artificial intelligence (AI) based clinical tools, key characteristics can be identified rapidly from a vast amount of data, to assist doctors, nurses and other medical staff to make more accurate diagnoses and better treatment decisions. This saves resources and enables clinical professionals to devote more time to patients. Using AI tools, treatment can be more precise and unnecessary interventions can be avoided and treatment outcomes improved. In cancer therapy, for example, treatment plans can be designed using artificial intelligence to minimize radiation exposure and carry out treatment as sparingly as possible.

To give the Bern medical hub the edge for the future of digital medicine, the University of Bern and the Inselspital are founding the Center for Artificial Intelligence in Medicine (CAIM). CAIM is a new platform in the field of artificial intelligence in medicine that will drive AI focussed research, teaching and translational research, i.e. the transfer of research results into clinical processes, services and products. Together with the partners sitem-insel and UPD, CAIM will start operations in January 2021. It is a virtual research Center and will be affiliated to the Faculty of Medicine, University of Bern.

A unique constellation
The new center benefits from the strong Bernese network in the healthcare, scientific and industry domains. Bern as a medical hub has great expertise in medical technology with a long track record of translational research excellence. Another of CAIM's strengths is the integration of outstanding medical research with leading engineering research, as found in the ARTORG Center for Biomedical Engineering Research at the University of Bern with the Inselspital, the largest digititalized university hospital in Switzerland.
"Thanks to this unique constellation, CAIM can connect this knowledge grown in close collaboration with our clinicians and industry with the potential of AI – making CAIM an incubation center for

medical technology", says Raphael Sznitman, director of the ARTORG Center and CAIM project manager. The new center will use AI to improve patient care and facilitate the tasks of doctors and nurses. Patients therefore benefit directly from research results and receive improved therapies specifically tailored to their needs.

Training a new generation of doctors and engineers

At the University of Bern, CAIM will feed into the ambitious digitalization initiative of the Medical Faculty: Five professorships in the field of AI and digitalization in medicine have been created to attract top researchers in these areas to Bern. They will be closely integrated into CAIM together with the more than 80 researchers working on AI and medicine at the University of Bern. Christian Leumann, rector of the University of Bern: "With CAIM, the University of Bern is investing in a research and teaching area that will decisively shape health care. By networking research in the field of AI in medicine, the impact of this research is greatly enhanced. In addition, we are developing education programmes that will be at the forefront of equipping a new generation of doctors and engineers with digital skills."

Through their work with CAIM, clinicians will be given insight into the engineering perspective and medical students will learn to use and shape the application of AI technologies in modern medicine. Educational options for AI in Medicine already underway are the continuing education programme "Artificial Intelligence in Medical Imaging" for medical professionals at the sitem-insel school and electives in introductory and advanced courses in "Digitilization and AI" for medical students of the University of Bern. A Master's programme for AI in Medicine for engineers will follow.

AI technologies for a digital hospital

The founding of CAIM is an integral part of the Insel Gruppe's digitalization strategy. Based on a new digital hospital information and control system (KISS), the Insel Gruppe plans comprehensive digitilization in all areas of hospital activities, including research, diagnosis, patient management, therapy and finance by 2023. CAIM will leverage the substantial, high-quality clinical data volume of the new system to develop clinically relevant machine learning tools that support physicians, nurses and other healthcare professionals in their daily clinical decisions. Data protection is a top priority: the new system meets the highest standards for processing sensitive health data.

Uwe E. Jocham, president of the Insel Gruppe: "The Insel Gruppe's hospitals will be digital in the future. The new main building of the Inselspital, which will be completed in 2023, will be ready for the world of the digital hospital. CAIM will help to make the large amounts of data that will be generated usable for research and development of new instruments".

Interdisciplinary and open to industry partners

CAIM will make AI expertise available to industry in various ways: it will share the latest research developments in AI technology, graduates of the CAIM study programmes will be a highly qualified new workforce, and CAIM will directly support industry cooperation - from pilot projects to large-scale multi-partner projects.

Industrial collaborations within CAIM are well suited for support by the Swiss innovation promotion programme "Innosuisse" to develop suitable solutions for industrial partners. The members of CAIM have a notable reputation for industry collaborations and successful establishment of start-ups. As members of CAIM, researchers are given access to structured data, computing capacity and project financing as well as support to launch products on the market: "sitem-insel as an innovation hub helps to transfer results from AI research into products and new therapies swiftly. We create a dynamic environment that encourages all teams to develop trustworthy AI-driven

medical technology solutions based on scientific findings," says Simon Rothen, CEO of sitem-insel.

Michael Kaess, director of the Department for Child and Adolescent Psychiatry and Psychotherapy at UPD, adds: "Artificial intelligence methods play an important role now and for the future of translational research at UPD, for example in the processing and analysis of large amounts of data to predict the course of diseases or associated risks. These technological possibilities will increasingly support the diagnostics and therapy of psychiatric patients at UPD". In anticipation of these developments, the UPD has established a "Digital Board". "The close, interdisciplinary cooperation within CAIM enables the UPD to benefit from the united expertise, whilst our experts in cognition and emotion, can make a significant contribution to the topic of "artificial intelligence", says Kaess.

Another important flagship for Bern as a center for excellence in medicine
CAIM will expand the capabilities of precision medicine in Bern, already at the forefront with the Bern Center for Precision Medicine (BCPM), and translational research, which is promoted by sitem-insel.

Member of the governing council and Director of Economic Affairs, Energy and Environment in the Canton of Bern, Christoph Ammann: "The Bern medical hub is based on a strong university and a highly innovative university hospital. Bern is now also taking a leading position in artificial intelligence. This will strengthen the Canton of Bern as a business location and create added value."

Further information and contact details can be found on the following page.

Center for Artificial Intelligence in Medicine (CAIM)

The Center for Artificial Intelligence in Medicine is a research, teaching and translation platform for medical technology that uses AI to deliver better care to patients and facilitate the work of doctors and nurses. CAIM capitalizes on the unique constellation in Bern that joins players from the scientific, healthcare and industry domains. It will be inaugurated in January 2021 as a Center of the University of Bern's medical faculty and the Inselspital, Bern University Hospital, with the University Psychiatry Services (UPD) and the Swiss Institute for Translational and Entrepreneurial Medicine, sitem-insel, as partners. Part of Bern's initiative for digitalization in healthcare, CAIM is a virtual center connecting engineers, physicians and scientists in the area of AI in medicine and providing them with resources and access to infrastructure. By bundling transdisciplinary know-how from the Bern Biomedical Engineering Network, it promotes and expands projects dedicated to the potential of AI technology for healthcare. CAIM will foster commercialization of AI technology innovation, support start-up incubation and create sustained value through best in class research, translation and economic growth.

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