

Commercial Partnerships

Center for Artificial Intelligence in Medicine (CAIM)



CAIM – who we are

Education

CAIM provides tailored AI in Medicine education for medical doctors and engineers through a portfolio of competitive and purposefully designed programs.

Dissemination

CAIM transmits trustworthy knowledge on AI in Medicine. This supports policy makers, educators and the general public by shaping current debates.

Infrastructure

CAIM facilitates access and availability to computer infrastructure, computational and data resources to support advanced digitalisation and AI research.

Research Fund

CAIM promotes technological innovation by funding projects with strong clinical breakthrough potential and a realistic pathway towards patient benefit.

Ethics

AI raises ethical questions. CAIM's Embedded Ethics Lab provides ethics support for research, education and interaction with clinical and industry partners.



Education



Dissemination



Infrastructure



Research Fund



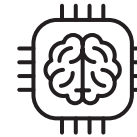
Ethics

Our key competencies include



AI for Medical Imaging

Medical images are rich sources of information but only a minority of these markers are annotated to make clinical decisions by healthcare professionals. Our research has developed transformative AI tools that can leverage deeper levels of complexities in medical image data that can assist clinicians to deliver faster, better and more reliable care decisions.



Internet of Things

Ubiquitous and pervasive sensing in devices that clinicians and patients use to manage chronic diseases like diabetes, to rehabilitate stroke or to warn of acute conditions like heart attacks, generate enormous data. Our AI research can designate functionalities to make these device bespoke to patients, thereby maximizing their efficacy to monitor, control and protect.



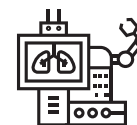
AI for Biosignals

Signals from hearts (ECG), brains (EEG) and hearing (Electro-cochleography) are examples of biosignals commonly used in clinical practice. Methods investigated in our research into using AI to recognize patterns that correlate with clinical meaning can provide enhanced, analytical outputs for diagnostics assessment by clinicians.



Computational Medicine

The pipeline of data from multi-OMICS platforms delivers significant molecular information through bioinformatics treatments. To harness meaning from this heterogeneous and highly complex datasets we have created applied deep learning methods that can analyze, deconstruct and be trained to make outputs suited to personalized medicine approaches.



Medical Robotics

Medical robots in rehabilitation, intervention and surgery are a clinical reality. Our world-leading automated robotics and AI navigation research has been translated into the clinic and the market-place through new ventures and commercial partnerships.



Case study

Varian Medical Systems

Using AI for faster and better routes to treat brain tumors

Before undergoing radiation therapy, brain tumor patients must have Magnetic Resonance Imaging scans to locate the tumor and organs at risk. This enables the radiation oncologist to plan the therapy. Currently, this is a time-consuming task carried out manually by clinicians, based on various guidelines, leading to different treatment plans depending on the individual clinician's interpretation, which can impact clinical outcomes.

Furthermore, healthcare delivery systems are seeing increases in patient load, with widening access to radiological cancer treatments. However, these treatments are not met with growing numbers of trained personnel leading to an unmet need for high-quality pre-treatment segmentation skills. Taken together, the industry wants to offer automated segmentation solutions that can address those challenges faced by their customers.

Varian established a collaboration with Prof Reyes laboratory to develop deep learning-based tools that would speed up

the clinical workflow by avoiding manual contouring and provide high-quality results through automated contours. Reduced treatment times and lower healthcare costs could be the result of shorter pre-treatment planning time, thanks to segmentation solutions that can interpret brain scans in an automated way.

This partnership enabled Varian and Prof Reyes group to bring forward their joint competencies and access to the clinical resources of the Bern University Hospital/ Inselspital to win funding support through the Swiss Innovation Agency, Innosuisse. The project will develop and generate clinical validation of the analysis and planning tools as well as evaluate suitable market-entry and business models for these cutting-edge products.

The Center for Artificial Intelligence in Medicine (CAIM) facilitates collaborations between industry and researchers in Artificial Intelligence (AI), robotics, medical imaging, and data science through a strong track record of successful solution-oriented translation projects. Industry partners who work with CAIM can benefit from strong fundraising know-how, access to clinical

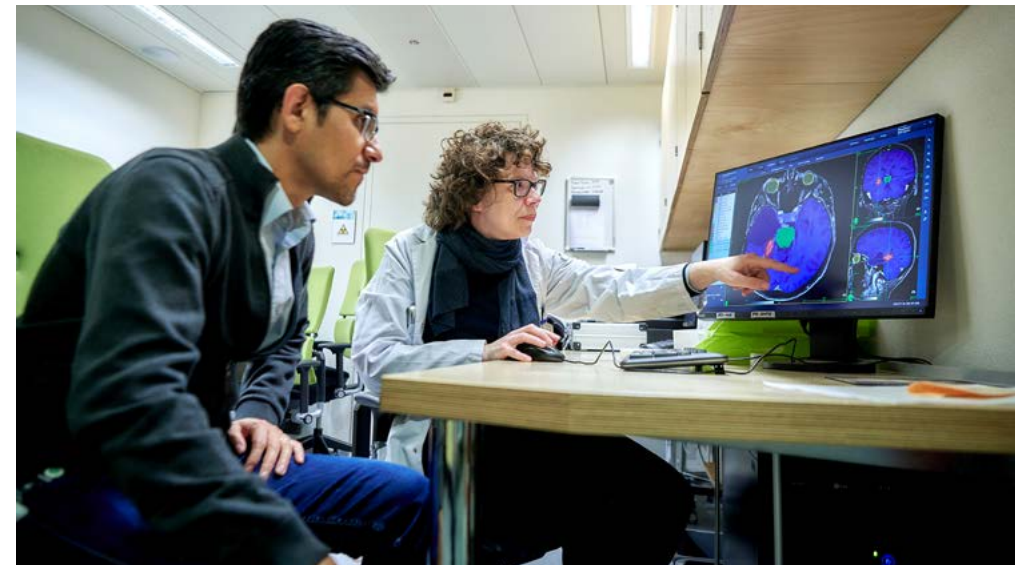
data and resources, and leading research expertise to carry out advanced, extramural R&D activities.

«Through the successful collaboration with Prof Dr Reyes group and CAIM, Varian Medical Systems will further strengthen their commercial cloud-based deep learning offering. In the future this will allow Varian to offer high quality brain tumor patient segmentation products especially in markets where there is a high patient load and/or where there is lack of experienced clinical personnel.»

Dr Stefan Scheib, Group Leader Applied Research, Varian Medical Systems, Imaging Laboratory GmbH, Dättwil AG

«Working with Varian Medical Systems has allowed us to translate our research into a working tool for an automated contouring system powered by Deep Learning technologies, that will introduce these advanced AI tools into the clinic and the marketplace».

Prof Mauricio Reyes, Group Leader Medical Image Analysis ARTORG Center for Biomedical Engineering Research, University of Bern



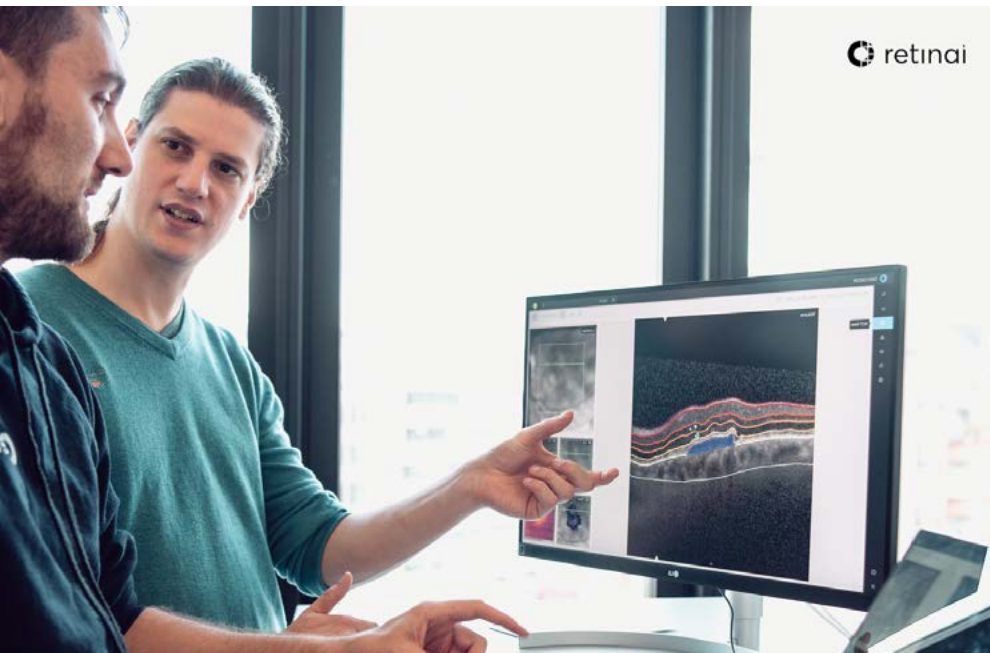
Commercial research collaborations

CAIM has agile and well-established formats for collaborations with commercial partners.

They are designed to give access to:

- › The latest research in AI for medicine. Our research groups tackle advanced clinical challenges with the help of AI solutions, and are recognised scientific leaders in the domain. Interacting with them through CAIM can give partners horizon-scanning opportunities of innovations to come.

- › Expertise to guide through challenges in strategic product development. CAIM is home to technical and clinical Key Opinion Leaders for AI in Medicine, whose expert opinions are much sought after by industry, investors, regulators, and policy makers.
- › Opportunities for industry – academic collaborations. The teams in CAIM have a long track record of participation in successful industry – academic collaborations. These include bids for national programs like the Swiss Innovation Agency's Innosuisse, EU Horizon Europe and commercial research collaborations with direct industry funding.



Education Master of Science in Artificial Intelligence in Medicine

- › Two-year program, 120 ECTS
- › International program in English
- › Admission with BSc in a variety of STEM subjects
- › Clinical, technical, regulatory and entrepreneurship modules
- › Rotations in university hospital departments to be instructed in medical specialties
- › Master's thesis in applied projects addressing clinical challenge topics



How to work with CAIM

Industry Objectives	How	Outcomes	Funding Programmes	Typical Timescales	Typical Costs
Develop new products and services	Work directly with CAIM's leading researchers to access their expertise and facilities Propose, shape and participate in nationally and internationally funded research projects	Application of cutting edge research results to the development of specific new products and services Pre-agreed access terms for newly developed IP	› Sponsored commercial research › SNSF and EU Funding › Innosuisse Programme	› 12 – 18 months › 1 – 5 years	From CHF 30'000
	Post-graduate researcher contracted to carry out project under academic and industry supervision	Final report on the project Opportunity to employ highly qualified staff	› Postgraduate research projects	Project specific	From CHF 50'000
Resolve specific product or process problems	Access to CAIM's world-leading academic expertise applied to defined technology or clinical problem	Novel or modified solution to problem in product or service	› Consultancy	Customer requirements	Individual rates
Explore ideas for new products and services		Prototypes, Proof-of-Concept data, clinical study data, publications, inventions, know-how	› Sponsored commercial research › Master's Thesis Projects › Doctoral Thesis Projects	Proposals submitted by February, projects start in September, outcomes available within 18/24/48 months	Typically CHF 50'000 - 150'000
Develop and upskill staff	Postgraduate secondment into company, or company staff secondment into CAIM lab	Transfer of new technical knowledge and skills into company	› Knowledge transfer funding	Customer requirements	Project specific
Investment into CAIM research fund/spin-outs	Project portfolio investment through research fund or spin-out investment	Early-stage access to novel technology ready for translation or equity stake in high-technology companies	› Direct investment › Angel funding	Project specific	Project specific

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