BIH Digital Health Accelerator
Demo Day 2024

May 28, 2024

BIH Berlin Institute of Health @ Charité

DHA Digital Health Accelerator

CHARITÉ UNIVERSITÄTSMEDIZIN BERLIN

2024 BIH Digital Health Accelerator Demo Day

The mission of the BIH is medical translation, helping bring findings from biomedical research into novel approaches for personalized prediction, prevention, diagnostics, and therapy. Conversely, it utilizes clinical findings to help researchers in developing novel approaches. The aim is to deliver relevant medical benefits for patients – turning research into health.

As the translational research unit of Charité – Universitätsmedizin Berlin, the BIH is building a translational ecosystem, promoting a systemic view of health and disease, and driving change in biomedical research culture.

The BIH was founded in 2013 and is funded 90 percent by the German Federal Ministry of Education and Research (BMBF) and 10 percent by the State of Berlin. In 2021, the BIH was partly integrated into Charité, maintaining close ties with the Max Delbrück Center for Molecular Medicine in the Helmholtz Association as a privileged partner.

The BIH Digital Health Accelerator Program (DHA) at Charité BIH Innovation funds, guides, and supports Charité/ BIH clinicians and researchers at all stages of readiness to turn their concepts into digital health solutions for patients and healthcare systems via licensing or spinoff.

Supported projects develop clinical decision support systems, diagnostics, digital therapeutics, software as a medical device, and patient applications and industry solutions based on technologies such as AI/machine learning, AR/VR, bioprinting, robotics, and sensors.

With a proven track record of 53 projects supported to date, 18 projects currently in the program, 7 projects preparing to spin off this year, and 10 alumni projects having spun-off to date (one raising a Series B, one exit by acquisition), the BIH DHA has taken root as the go-to-program for clinical digital health innovation – a unique program in the German and broader European university hospital landscape.

Please join us in celebrating this success and especially in thanking specifically those clinicians and researchers who are developing highly innovative digital health solutions in addition to their daily work advancing medical science and delivering world-class medical care in these challenging times for the German healthcare system.

In the future, the BIH DHA Program aims to broaden its geographical scope by collaborating with additional academic hospitals in Germany to scale digital health translation to benefit patients and our society. In addition, BIH continues to grow its DHA network by further deepening collaborations with academic institutions and corporate partners.

Thank you for joining and we hope you enjoy the BIH DHA Demo Day 2024!

Sincerely yours,

Prof. Dr. Christopher Baum
Chairman of the Board of Directors, BIH, and Chief Translational Research Officer, Charité

Dr. Doris Meder
Administrative Director (interim), BIH

BIH Digital Health Accelerator Program

2024 marks the seventh year for the BIH Digital Health Accelerator. We once again look back at the program's beginnings and venture a glimpse into the future.

By the Numbers

53 Projects funded to date

25 Fields of medicine, research

18 Projects currently in program (Stage 1: 9, Stage 2: 9)

10 Spinoffs graduated

1 Exit by acquisition

150+ Jobs created by spinoffs

Based on the vision of BIH leadership to tackle the missing link between medical research and medical application – product development – and supported by dedicated federal funding, the BIH Digital Health Accelerator was conceptualized in late 2016.

The DHA team piloted the program right away embracing the principle: Building the plane as we fly. What may seem haphazard at first in fact applied sound guidance for any innovation unit: Gather senior leadership support around a clear vision and success metrics, activate the resources needed to get going, and learn by doing: Don't be afraid to make mistakes, but if you do, make new ones.

Pilot Phase

In 2017, an external committee selected four projects to form the pilot DHA cohort. All projects considered either the heart or the brain with their product development ideas; in hindsight maybe no coincidence.

Based on best practices in product development, the core elements of the program were implemented that are still valid today: Co-working in an interdisciplinary work environment away from daily routine; mentoring by subject matter experts and seasoned professionals; and iterative product development to ensure future solution-need or product-market fit.

At the first Demo Day, the four projects presented their prototypes and the program received the green light from BIH leadership and political decision makers to take root.

Proof of Concept Phase

Between 2018 and 2024, the program grew steadily, from six new teams in 2018 to eight in 2019 to ten new teams in 2020. The program diversified in medical fields, research domains, and digital technology areas. 2021 caused the program to slow down temporarily due to the acute clinical duties of project teams and clinical study prioritizations.

BIH Digital Health Accelerator Program

The program evolved into the two stages: Stage 1 to validate the medical need and the core technology, to prototype and iterate rapidly, and to get a basic understanding of regulatory, business, and reimbursement matters. Stage 2 to develop regulated, clinically validated digital medical products for diagnosis or therapy, digital platform solutions, or digital tools to improve drug development. In this stage, teams around clinicians and researchers grow in size and entrepreneurship knowledge, and prepare to bring their products to the healthcare market and medical application, e.g., via licensing or spinoff formation.

Over time, the following key success factors manifested themselves. One critically important success factor is the breadth and depth of knowledge and guidance by mentors, which is kindly supported by the German Accelerator Life Sciences, and other networks.

Equally important and somewhat unique to working at a university hospital turned out to be team completion: Finding, matching, and supporting new team members with needed skills sets, e.g., in product development, regulatory affairs, and new venture development.

In 2020, through the emergence of the first set of digital health spinoffs from the DHA program, tangible proof of concept was achieved.

To date, ten spinoffs have emerged from the DHA program. Having developed and launched their medical products and digital health solutions, they have created over 150 jobs in the region. Eighteen new solutions are currently under development.

Outlook: Growth Phase and Broader Opportunity

By 2024, the BIH DHA program has developed standardized structures and processes, a program curriculum around a robust digital health product development framework, and knowhow that could support the translational ecosystem at Charité and BIH permanently by fueling the development and transfer of digital health innovations. In addition, the BIH DHA program is also exploring ways to cooperate with additional university hospitals and corporate partners to foster digital health innovation at scale for the benefit of patients and society.

Structured Process for digital health/ medical product development

Funding including up to 50 % protected time from clinical obligations

Mentoring by subject matter experts, industry professionals and seasoned founders

Community of digital health innovation peers and access to talent pool

Network of potential transfer partners in industry and (corporate) venture capital

Co-Working Space for interdisciplinary work at BIH Digital Labs

DHA STAGE 1: PROTOTYPE

Medical Need and Concept Validation — Rapid **Prototype** Development — 6 months

DHA STAGE 2: PRODUCT

Iterative **Product** Development — (If team goal) **Spin-Off** Development — Up to 24+ months

- Spinoff
- License
- Co-Dev.
- Sale

Patients / Market

Agenda

6:30 – 6:40 pm · · · · · · · · · · · **Welcome & Introduction by Event Host**

Tjaša Zajc
Journalist, Host Podcast Faces of Digital Health, Patient Advocate

6:40 – 6:45 pm · · · · · · · · · · · **Opening Remarks**

Prof. Dr. Heyo K. Kroemer
Chief Executive Officer of Charité – Universitätsmedizin

6:50 – 7:00 pm · · · · · · · · · · · **Impulse Lecture**

Digital Health – A Life Saver for Physicians and Patients
Dr. med. Johanna Ludwig
Trauma Surgeon, Co-Founder Luujuu, Higher Education
Committee Chamber of Physicians Berlin

7:00 – 7:10 pm · · · · · · · · · · · **Talk**

How Tech is Reclaiming Time for Patient Care – Tech, Trust & Patients
Tjaša Zajc
Journalist, Host Podcast Faces of Digital Health, Patient Advocate

7:10 – 8:30 pm · · · · · · · · · · · **BIH Digital Health Accelerator Pitch Session**
(here announced in alphabetical order)

CalciQuant: Precise Braininsights to Shape CNS Drug Development
Jeremy Krohn, MSc
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Deep Brain Decode: Training-Free Personalization of Adaptive DBS Therapy
Timon Merk, MSc
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Fractalyzer: Innovating Non-Invasive Prostate Cancer Diagnosis with Fractal Analysis
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gaitMATE: A Digital Platform Empowering Patients and Accelerating Therapy Development for Inherited Neuromuscular Disorders
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NURTURE: Pioneering Pregnancy Care Through AI-Driven Therapeutic Advancements
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RadiologyFlow: Personalized and Automated Radiology Report Correction
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UroSavvy: Advancing Value-Based Urogenital Care & Revolutionizing Postoperative Management
Dr. med Laura Hatzler
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VarFish: The Go-To Genome Interpretation Platform for Clinicians in Labs and Academic Centers
Lara Einicke, Max Xiaohang Zhao
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VISIONS: The Digital Aid for Informed Decisions After Sexual Assault
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8:30 – 8:35 pm · · · · · · · · · · · **Closing Remarks**

Dr. Doris Meder
Administrative Director (interim), Berlin Institute of Health (BIH)

8:35 – 8:40 pm · · · · · · · · · · · **Thank You & Closing**

8:40 – 10:30 pm · · · · · · · · · · · **Networking Reception and Meet the Teams of DHA Program**

CalciQuant: Precise Braininsights to Shape CNS Drug Development

Over 165 million Europeans are affected by Central Nervous System (CNS) disorders, including Alzheimer's Disease, Dementias, Epilepsy, Mental Disorders, and Parkinson's Disease. Approximately 1 in 3 individuals will experience a neurological or mental disorder during their lifetime, making CNS disorders the leading cause of ill health and disability globally. The economic burden of major CNS diseases amounts to around $800 billion annually in the US alone. Despite this significant burden, effective treatments remain scarce.

Developing and bringing innovative treatments for CNS disorders to market remains a formidable challenge. Despite notable progress in understanding their complex biology and identifying new drug targets, setbacks have been prevalent and costly. The failure rate for new drugs targeting CNS diseases is high compared to other areas of drug discovery, leading to the discontinuation or downsizing of numerous pharmaceutical CNS programs. However, with promising late-stage candidates emerging, there's optimism for the future of CNS innovation.

Team CalciQuant is focusing on a digital solution to spot potential setbacks early on, by providing a digital analysis pipeline based on a set of standardized measures of human brain cell function that can provide key insights regarding the potential success of compounds – before costly human clinical trials even begin. For pharmaceutical and biotech companies working in CNS drug development, such indicators result in a vast reduction in time and cost invested in clinical trials.

How does it work? CalciciQuant's digital analysis platform is able to reliably predict toxicity, validate targets, as well as identifying off-target effects on synapses and neurons and other cell types, all using calcium imaging. CalciQuant uses state-of-the-art stem cell-derived cultures of human brain cells, a modular digital pipeline for analysis, and a highly standardized approach to measure function from calcium data. It is fully-automated and highly sensitive, enabling it to capture changes in multiple functional parameters.

Team CalciQuant is a mixed project from Charité and DZNE and consists of 3 PhD candidates in Neuroscience and their head of the Synaptic Dysfunction Group. Together, the team has more than 20 years of experience in neuroscience, and research specializing in functional assays and digital image analysis.

CalciQuant envisions a world where patients with CNS have pharmaceutical therapy options that are effective, well-tolerated, and numerous in number.

ASK
- Cooperation or Partnership with pharmaceutical or technology industry as well as midsize biotech for further development and testing of assay and algorithm
- National and international clinical research partners to further develop and test CalciQuant in disease models
- Cooperation with CROs to further develop and test CalciQuant in early clinical trials
- Team members: Business with expertise in drug development and pharma, Developer (frontend and backend), Regulatory Expertise

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KEYWORDS
Neuroscience, CNS, Drug Development, Algorithm, Assay, Calcium Imaging

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Deep Brain Decode: Training-Free Personalization of Adaptive DBS Therapy

Movement-related symptoms in Parkinson's disease (PD) and other neurological conditions arise from irregular electrical signals in the brain regions responsible for motor control. Deep Brain Stimulation (DBS), approved since 1997 by the FDA, presents a transformative treatment option for PD patients as medications lose efficacy. By combining brain-implanted electrodes with a pacemaker-like device implanted under the skin of the upper chest, patients often achieve remarkable symptom relief.

Although for over 30 years approved the current DBS therapy still lacks adaptability to fluctuating symptom severity levels in neurological disorders. This can lead to challenges for patients and their quality of life, as the constant level of stimulation doesn't match symptom volatility. Furthermore, DBS protocols need constant adjustment over time to maintain a good therapeutic effect and avoid the side effects induced by overstimulation. Next generation adaptive DBS therapy, in which stimulation strength adjusts automatically to symptoms, promises to solve these problems but their development is severely hampered by the extreme amounts of clinician time required in tailoring such approaches to specific individuals.

Deep Brain Decode aims to solve this problem and usher in the mainstream use of adaptive DBS by using machine learning to estimate a patient's current symptoms state and dynamically adjust electrical stimulation therapy in real-time. This digital solution is possible thanks to a database of invasive recordings of patients with various neurological disorders accrued across five years, all in one of the world's leading deep brain stimulation research centers. The recordings enabled the team to build decoding models and demonstrate proof-of-concept validation of generalized neural decoders that can be integrated in a plug-and-play fashion into deep brain stimulation implants. Critically, the unique algorithms developed by the team allow for training-free personalization of the stimulation, removing the by far biggest obstacle to implementing adaptive DBS – the unscalable demands on the clinician's time required to personalize and implement adaptive techniques.

Team Deep Brain Decode is fully based at Charité and consists of a neuroscientist and expert in machine learning, a medical doctor experienced in conducting neurophysiology recordings and data analysis, and a key expert in the field of DBS, movement disorders, and neurotechnology.

Deep Brain Decode aims to enable next generation therapy for neurological disorders by providing medical device companies with generalized neural decoding models.

ASK
- Partnerships/Co-operation with national and international clinical movement Centers for solution testing
- Partnership with industry (e. g. implant manufacturers)
- Team members: Software Development (Backend), Computational Science and Engineering, Business
- Individuals and patient groups for product iterations

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KEYWORDS
Neurology, Parkinson's, DBS, Movement Disorders, Software, AI, Personalized Treatment, Adaptable

Fractalyzer: Innovating Non-Invasive Prostate Cancer Diagnosis with Fractal Analysis

Prostate cancer is the 2nd most commonly occurring cancer in men and the 4th most common cancer overall. About 1 in 8 men will be diagnosed with prostate cancer during their lifetime. The standard procedure for its diagnosis is clinical history, a PSA blood test, followed by an MRI scan and finally, a biopsy. Despite their frequency, prostate biopsies remain expensive, painful, undignified affairs with limited diagnostic yield.

In current prostate cancer diagnostic procedures, as many as 50% of biopsies yield negative results, while up to 35% show false positives. Fractalyzer offers a solution by utilizing standard MRI imaging to non-invasively determine whether a prostate lesion warrants a biopsy, effectively addressing these issues.

It does by first conducting a "fractal analysis" of lesions detected on scans. Such an analysis visually displays how 'complex' a lesion is, with lesions that display higher fractal dimensions linked to increasing tumor aggressiveness. By visually showing a cancer's aggressiveness, clinicians can easily segment cases into low- and high-risk categories that may or may not warrant a further biopsy.

The implementation of Fractalyzer is compatible with standard clinical equipment and can be applied retroactively to existing data. By integrating their non-invasive, already patented method into a patient's diagnostic journey, Fractalyzer aims to reduce the number of unnecessary biopsies and provide a reliable non-invasive option for active surveillance to monitor cancer development. This could optimize healthcare resources, avoid unnecessary complications and pain for biopsies, and provide an easier way to manage non-aggressive tumors in prostate cancer patients.

Fractalyzer boasts a dynamic team featuring two distinguished radiologists. One serves as the vice chair of the radiology department at Charité, while the other holds a professorship at Japan's Mie University and is partially funded by the German Research Foundation (DFG). The team also benefits from the guidance of an experienced economic advisor with a strong background in medical informatics, enhancing their strategic approach.

Team Fractalyzer envisions a future where prostate cancer patients experience a non-invasive and innovative approach to cancer grading, marking a significant leap forward in cancer diagnostics.

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KEYWORDS
Radiology, Imaging Analysis, Prostate Cancer, Biopsy, Deep Learning, Risk Assessment

ASK
- Partnerships/Co-operation with national and international clinical centers for prostate cancer to stress test algorithm and validation
- Partnership with industry (e. g. Medical Device Manufacturer)
- Team members: Software Development (Backend+ Frontend), AI, Sales

gaitMATE: A Digital Platform Empowering Patients and Accelerating Therapy Development for Inherited Neuromuscular Disorders

Genetic or Inherited Neuromuscular Disorders (INMD) – encompassing a range of rare diseases such as Charcot-Marie-Tooth Disease (CMT) and inherited transthyretin amyloidosis (ATTRv) – present a cruel paradox. On the one hand, patients suffer progressive degeneration affecting muscles and peripheral nerves that requires expensive and specialized care. On the other hand, the slow progression of their disease means that they experience long periods of relative stability, where unnecessary clinical check-ups represent a significant amount of the burden they face. This tension – between catching new developments swiftly to avoid complications and reducing unnecessary check-ups and specialist visits – is a delicate balancing act for the over 15 million patients worldwide affected with INMDs. This overlooked patient community is underserved and especially with promising new therapies on the horizon future opportunities are at risk of failing.

Current solutions on the market only answer a marginal proportion of the needs of patients with genetic, slowly progressive, and incurable INMDs. gaitMATE aims to cater to these specific needs by fostering a connection between patients and physicians through a patient-centered platform solution. This digital platform facilitates remote access to specialist centers, guiding patients through the fragmented healthcare system and offering tailored support. Additionally, gaitMATE serves as a digital hub, enabling patients to engage in remote research opportunities and contribute to future treatment development. Through personalized gait analysis, gaitMATE endeavors to advance digital monitoring technology for various gait diseases. Furthermore, the platform provides support for post-market surveillance of existing treatments and assists in the implementation of new, efficient outcome measures, ultimately facilitating quicker and cost-effective trials.

Team gaitMATE consists of a junior neurologist who established the CMT clinic at Charité and is an active supporter of patient advocacy groups being a CMT patient herself; a Charité senior neurologist, head of neuromuscular group, and founder of the Amyloidosis Center Charité Berlin (ACCB); and an electrical engineering student experienced in building healthcare data integration systems. The team is supported by a collaboration partner from Columbia University who is an expert in Neuroscience and digital biology.

gaitMATE endeavors to bridge the gap and empower individuals affected by INMDs, as well as physicians, in the treatment and development of new therapies through its platform solution.

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KEYWORDS
Neurology, INMD, CMT, Rare Diseases, Amyloidosis, Patient-Centered Care, Drug Development, Digital Biomarker

ASK
- Partnerships/Co-operation with national and international centers for INMD
- Partnership with industry (e. g. Pharma Industry)
- Team members: Software Development (Backend+ Frontend), AI, Business, Regulatory
- Individuals and patient groups suffering from INMD for product iterations

NURTURE: Pioneering Pregnancy Care Through AI-Driven Therapeutic Advancements

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Every year, there are 200 million pregnancies. Approximately half of them have at least one pregnancy complication. Pregnant individuals face challenges due to the absence of preventive therapies and limited options for acute therapies for pregnancy-related conditions, such as diabetes, hypertension, or preeclampsia and many more.

The current standard of care is focusing on treating symptoms rather than the root cause. Some pregnancy-related conditions can have a lasting impact on the long term cardiovascular and metabolic health of both mother and child. This gap in early preventive treatment contributes to increased healthcare expenses and adverse outcomes due to long term complications.

Team NURTURE is building an AI-based platform solution built on a placental organoid multi-omics pipeline. The data for in vitro drug testing is combined with in vivo clinical data, overcoming limitations in pre-clinical trials during pregnancy. The aim is to increase the number of therapeutic options available to treat complications in pregnancy. This is done by quickly identifying compounds that are effective in treating the condition and by having initial safety data before any animal studies are conducted.

Ultimately, more than half the population benefits from improved access to effective and safe therapeutics that can reduce harms associated with pregnancy related disease. This is accomplished by identifying the most promising compounds in leading pharmaceutical companies' portfolios and focusing their efforts on those that will make the biggest impact.

NURTURE's uniqueness lies in the combination of AI-enhanced placental organoid multi-omics and clinical data that enables early predictive readouts for in vitro drug testing. The focus on pregnancy-related diseases and integration of clinical and in vitro data makes it a pioneering solution.

This team is led by a clinician scientist with expertise in translational studies investigating pregnancy complications and an international expert in AI & Data Science in Biology. Together they lead a team of computational biologists with a wet lab background, ensuring they collectively have all the required specialized expertise essential for the project's success.

NURTURE will revolutionize the number of therapies available during pregnancy by overcoming obstacles in the path of new drug approval. NURTURE's mission is to reduce the long-term healthcare burden caused by complications in pregnancy by improving the availability of preventative therapies.

ASK
- Co-operations with national and international partners for data sharing and development (e.g. other hospitals, biobanks, fertility centers)
- Co-Development with industry partners to explore further use cases
- Team members: Product Manager, Business Advisor from the Drug Development field, Regulatory Advisor

KEYWORDS
Women's Health, Obstetrics, Pregnancy Diseases, AI, Organoids, Drug Development, Preeclampsia, Safety

RadiologyFlow: Personalized and Automated Radiology Report Correction

The radiology report is a vital tool for guiding patient care, yet radiologists often lack formal training in reporting. While adhering to key principles can promote clear communication of imaging findings, impressions, and recommendations, crafting a report that meets the needs of various audiences can be challenging and errors can negatively affect patient care.

As a result, radiologists spend up to 30% of their time proofreading and correcting reports for potential mistakes. That is partly because existing solutions do not serve the needs of clinicians for automated correction and formatting of their radiology reports, leading to high reporting time. And crucially, their features are not tailored to the highly individualized SOPs of every institution, their data, subdisciplines, and to the German language setup.

Team RadiologyFlow has developed an AI-powered software that automatically detects and corrects errors in radiology reports. Leveraging large language models trained on vast radiological texts, RadiologyFlow identifies spelling, grammar, terminology, and formatting issues, offering adaptable automated corrections tailored to customers' data and SOPs. With its easy integration into PACS or RIS systems, the one-click corrections significantly reduce proofreading time everywhere radiology reports are issued.

RadiologyFlow goes further, ensuring corrections align with the radiologist's intended meaning, reporting style, and the local SOPs. This personalized approach seamlessly integrates with existing speech patterns and workflows, facilitating faster, more accurate report creation. Learning from interactions, RadiologyFlow evolves into bespoke software personalized for each user. This means radiologists can focus their expertise on high-quality interpretation, where it matters most. Referring physicians receive clear, consistent, error-free reports to guide optimal patient care; radiologists can enjoy greater efficiency and job satisfaction; and patients benefit from quicker answers and better outcomes.

RadiologyFlow's team combines deep expertise in radiology workflows, AI/NLP, and software engineering derived from Charité's radiology and neuroradiology departments and is supported by senior radiologists at the German Heart Center in Munich and TUM.

Radiology Flow's mission is to rid the world of radiology reporting errors—one AI-assisted report at a time.

ASK
- Partnerships/Co-operation with German speaking institutions for stress test of algorithm and adaptability
- Partnership with industry (e. g. PACS or RIS Provider, Radiology Tech, Documentation)
- Team members: Software Development (Frontend, Backend), Machine Learning, Business, Sales
- MVZs or Hospitals for product iterations

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KEYWORDS
Radiology, Reporting, Adaptive AI, Autocorrection, Work Flow Optimization, Quality Assurance

UroSavvy: Advancing Value-Based Urogenital Care & Revolutionizing Postoperative Management

Urogenital complications, whether arising from surgeries, diseases, or treatments, are a persistent concern in medical practice. Inadequate detection and management can transform routine procedures into tremendous challenges, extending hospital stays, requiring multiple interventions, and diminishing patients' quality of life. Delayed identification and suboptimal management of these complications impose significant financial burdens on hospitals, with costs per case reaching up to 1 million euros.

Early identification and management of postoperative urogenital complications are vital for improving patient outcomes and reducing healthcare costs. This is where UroSavvy, a clinical decision support system, steps in. UroSavvy is specifically crafted to empower healthcare professionals and hospitals with advanced capabilities for detecting, treating, and evaluating such complications.

Utilizing state-of-the-art algorithms and a diverse and unique dataset from the Charité Pelvic Floor Competence Center, the technology helps to optimize decision-making processes and strengthen early detection. Input data, including medical history, surgical reports, and diagnostic results, is evaluated alongside clinical guidelines and best practices. The resulting guidance can enhance patient care throughout the post-operative period via the suggestion of tailored interventions and risk profile generation for identified urogenital issues.

UroSavvy aims to reduce complications, improve outcomes, and lower costs. By fostering collaboration among healthcare professionals, including urologists, gynecologists, and surgeons, it enhances decision-making and patient care. Patients benefit from early detection and personalized treatment plans, leading to better outcomes, quality, and reduced costs.

The team includes experts from Charité's Department of Urology and Department of Gynecology. One leads the Pelvic Floor Center and founded the "Comprehensive Endourological Management of Urogenital Complications" Network, while the other heads a research group in Sexology and Sexual Medicine within the Department of Gynecology and Breast Center.

UroSavvy's vision is to seamlessly integrate postoperative complication management into value-based healthcare. By offering tailored decision support for hospitals now and remotely soon, UroSavvy aim to enhance patient outcomes and reduce costs, establishing UroSavvy as the premier digital platform for urogenital complication management globally.

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KEYWORDS
Urology, Gynecology, AI, Surgery, Postoperative Complications, Decision Support Tool, Value-Based Healthcare

ASK
- Co-operations with national and international clinical partners for data sharing and development (e.g. other hospitals treating urogenital complications)
- Co-Development with industry partners (e.g. monitoring provider or surgery instrument provider) to explore further use cases
- Team members: Product Manager, Business Advisor with understanding of national and international value-based care requirements, Regulatory Advisor, Developer (Frontend and Backend)

VarFish: The Go-To Genome Interpretation Platform for Clinicians in Labs and Academic Centers

An individual's genetic setup controls a large part of their health. While understanding this is unbelievably valuable for clinical decision making, interpreting and making sense of this data remains a slow and laborious process. For patients with one of more than 6.000 different rare diseases – making up more than 250 million people worldwide – this adds to an already long and strenuous diagnostic journey. Even with whole genome sequencing over 50% of cases go unsolved.

A major bottleneck here is the interpretation of genetic data. Finding the key variant which causes the disease requires fishing in a large "genetic pool" of millions of benign variants. This process is still highly manual, requiring a complex workup that takes a trained geneticist multiple hours per case.

VarFish introduces a clinic focused digital solution that aims to make genetic testing faster and more efficient. VarFish's geneticist-focused software platform automates major parts of the diagnostic workflow, significantly speeding up diagnoses.

Created by geneticists and bioinformaticians with years of experience in rare disease diagnostics, this platform addresses the unique requirements of expert clinicians: It allows easy filtering using complex rules, annotating of variants with machine learning models, and quick access to information on gene-disease associations. Through built-in data sharing capabilities, such insights can then easily be discussed with experts and shared in public variant databases.
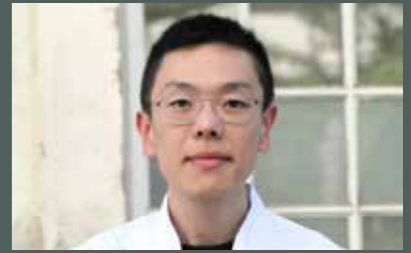
All these features reduce the time required to assess genetic variants by over half, or seven hours per case. Diagnostic labs performing whole genome analysis can benefit from a robust database that integrates multiple prediction models. For patients, the result is faster diagnoses, which can lead to specific treatments for their disease.

VarFish's team consists of an experienced bioinformatician and geneticists with multiple years of whole genome interpretation experience and research experience in high performance computing and machine learning.

VarFish envisions in to be the primary genome interpretation platform for labs and university hospitals across Europe and beyond, as whole genome sequencing becomes vital in diagnostics.

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KEYWORDS
Whole Genome Sequencing, Genetics, Bioinformatics, Translational Genetics, Rare Diseases

ASK
- National Diagnostic labs: cooperation for co-development and implementation of Varfish
- Sequencer manufacturing companies: partnerships to integrate Varfish into existing pipelines
- Geneticists/physicians: collaboration to incorporate needs into diagnostic sequencing
- Patient organizations: involvement in data analysis and meaningful reports

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www.visions-project.com

KEYWORDS
Women's Health, FemTech, Sexual Assault, Emergency Care, Digital Aid, Aftercare

VISIONS: The Digital Aid for Informed Decisions After Sexual Assault

In the EU, 1 in 10 women aged 16 and older have experienced sexual violence, yet only around 10% seek assistance. With just over 10,000 women reporting sexual violence to the police each year in Germany, this suggests the real number of incidents is significantly higher. The main reason for this low number is the difficult journey survivors faced to access clinical support, evidence collection, and follow-up care. The bureaucratic and confusing process causes many women to drop out, reducing the access to support. This unresolved trauma burdens the German healthcare system with around €1.15 billion annually.

After experiencing sexual violence, many women seek support from either the police or emergency rooms for evidence collection. Due to the vulnerability of the survivor and the time sensitive nature of evidence collection, these initial visits are highly influential on the survivor's overall experience and future outcome. However, both survivors and clinicians encounter challenges in these settings. Survivors face uncertainty about their immediate and future support options, while clinicians feel overwhelmed by legal responsibilities and inefficient processes, inhibiting their ability to support survivors. Simplifying support services and evidence collection can ease these burdens and improve outcomes for survivors and clinicians alike.

VISIONS has been developed to close the gaps for all parties involved by offering an accessible digital solution to seamlessly support survivors, clinical examiners, and, if necessary, the police throughout the entire process. This solution aims to remove barriers for survivors of sexual violence, allowing them to make informed decisions about their next steps, such as examination, evidence collection, and interview protocols. To achieve this, VISIONS offers a digital companion to guide women through the process in the emergency room, provide context regarding their rights and options during care and reporting, and discharge support to ensure they do not miss important follow-up steps and check-ups with their local gynecologist. An intuitive digital documentation tool streamlines evidence collection for clinicians, offering background information along the way. This comprehensive approach guarantees high-quality evidence and enables them to provide the best possible care for survivors.

Team VISIONS is composed of two gynecologists in training from Charité's Department of Gynecology. Their solution arises from their direct experience in daily practice, having encountered the aftermath of sexual violence as integral members of the obstetrics and gynecology team for several years. Through expert input and flawless documentation, VISIONS streamlines, provides reliable evidence, and ensures long-term societal benefits.

ASK
- Co-operation with national partners for feasibility testing and scalability testing of the solution
- Partnerships with health insurance companies for feasibility study
- Co-operations with support groups and gynecologist for user-centric user design
- Co-operations with politics (Local and National) and law enforcement (e.g. Police) for legal advice
- Partnerships with philanthropy, and companies or individuals interested to support the topic

Notes

Exploration of Heart Disease and Cancer Using Fractal Analysis Technology

In Europe alone, approximately 3 million cardiac catheterizations are performed every year. While about one third of these cases lead to positive outcomes, the remaining cases suffer from small vessel disease or do not benefit from the procedure. Thus, an estimated 2 million heart catheters performed every year suffer from the related risks of this invasive procedure and high costs to the healthcare system.

Building on the characteristics of self-similarity and scale-invariance, this fractal analysis tool can be used to analyze patterns of blood supply, and thereby, for instance, differentiate coronary artery disease from small vessel disease. Fractal analysis technology promises to enable new diagnoses and inform therapy choice also beyond heart disease, e.g., for breast, liver, and prostate cancer.

The team, consisting of highly experienced radiologists and researchers, has developed working prototypes and achieved proof of concept, is pursuing patent protection, and is clinically validating the technology across potential fields of application.
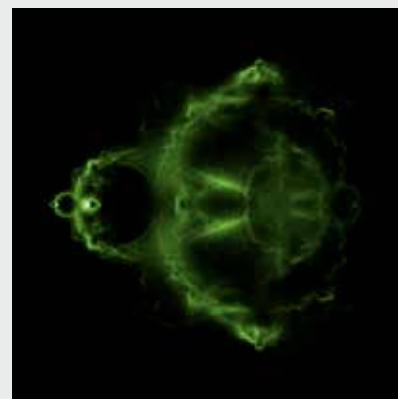
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KEYWORDS
Radiology, Cardiology, Oncology, Fractal Analysis

Prediction 2020: Predicting Stroke Risk with Artificial Intelligence

Stroke is one of the major causes of death and disability. The lifetime risk for stroke is 1 in 4. Once a first stroke occurred, the risk of a second devastating stroke is high. However, stroke risk factors are well known. 15 % are potentially preventable secondary strokes.

The team Prediction 2020 developed an AI-based image analysis solution to predict the individual risk of stroke. Furthermore, the team developed a simulation of the brain vascular system to predict outcomes of therapy alternatives to enable physicians and patients to make informed therapy choices.

The Prediction 2020 team consists of a neurosurgeon and lawyer, computational neurologists, AI experts and senior software developers. After the BIH Digital Health Accelerator Program, the project was part of Startupbootcamp Digital Health Berlin and was invited to join the "Readiness Program" of the German Accelerator Life Sciences, and was partner in several national and international research grants with industry and academic solutions.

PREDICTioN2020

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Heart Disease Risk App and Automated CT Analysis

Heart Disease Risk App and Automated CT Analysis

This project consists of two complementary projects in the radiology space.

The Cardiac Risk App targets the 20 million annual stable chest pain patients in Europe, of which only an estimated 50% receive per-guideline care. The mobile phone app aims to allow a targeted analysis in a highly accessible way in most care settings, thereby aiming to improve the rate of per-guideline care for stable chest pain patients.

Cardiac CT analysis (CTA) today is a complex, manual analysis created by experienced radiologists to quantify stenosis and characterize plaque. Given this complexity, manual analysis is time-consuming and costly. The intended solution aims at utilizing machine learning technology for automated image analysis as input for analysis and final assessment by the radiologist.

The team consists of highly experienced radiologists and researchers, in addition to machine learning experts and software developers.

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KEYWORDS
Radiology, Cardiology, Cardiac Risk Assessment, App, CT, Deep Learning, Image Analysis

X-Cardiac: AI-based prediction of complications in ICU

Intensive care units (ICU) are highly challenging environments that include demanding caseloads and the need for decision making. Post-operative complications can significantly increase mortality for 100,000 patients per year in Germany, and can result in recurrent surgeries, and longer stays at the intensive care unit, which causes a substantial economic burden for hospitals.

To solve this challenge, the team x-cardiac developed a real-time AI-based platform solution to recognize postoperative complications, e.g., severe internal bleeding, enabling ICU staff in real-time to intervene before the devastating consequences manifest.

The team's vision is to break the "deadly triad of cardiac surgery" to improve patient care, reduce mortality, and reduce the length of stay at intensive care units (ICU), thereby improving health system economics, and enable healthcare professionals. Its products include x-c-bleeding™, which targets postoperative bleeding, and forthcoming offering x-c-renal-injury™, which targets the early detection of renal injury.

The team consists of a cardiac surgeon/computer scientist, experienced machine learning experts, and software developers. The resulting company, X-cardiac, spun off in 2021 and is based in Berlin. Their internal bleeding module is clinically validated in a study with 10,000 patients, published in The Lancet Respiratory Medicine, and is CE certified. The team is currently developing its second module to predict renal failure.
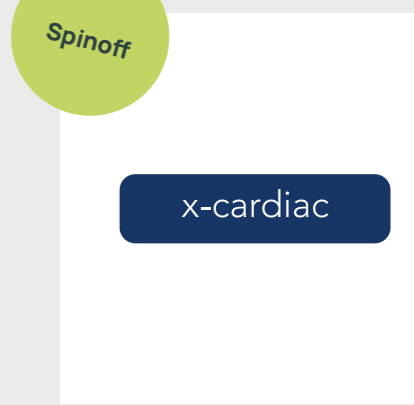
Spinoff

x-cardiac

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aignostics: Computational Pathology

Voted by Newsweek as a top digital health company in its inaugural 2024 ranking, Aignostics is currently raising Series B funding.

aignostics-Diagnostic in Pathology and Optimization of Drug Development Histological image analysis, performed by pathologists, is a crucial step in diagnosing many autoimmune, degenerative, and infectious diseases. Given our aging population and the increase of cancer cases worldwide, a global shortage of pathologists is expected.

To address this challenge, team aignostics has developed a patented "Explainable AI" (layer-wise relevance propagation) to assist pathologists in standardized and automated qualification and quantification of tissue features. This solution is more accurate and faster than today's manual gold standard. The system can also be applied to drug development. Pharmaceutical companies can augment histomorphological assessments in preclinical animal studies or in clinical trials to stratify patients in order to further improve drug efficacy and toxicity analyses.

Prof. Dr. Federick Klauschen (now LMU), Viktor Matyas, Dr. Maximilian Alber founded in cooperation with Prof. Klaus-Robert Müller, a globally renowned expert on ML from Technical University Berlin in 2018 aignostics. The Berlin-based company is funded by Boehringer Ventures and HTGF and has over 100 employees with interdisciplinary expertise to date.

Spinoff

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KEYWORDS
Digital Pathology, AI/ML, Cancer Diagnosis, Toxicity Screening, Clinical Trials

Cardio Prime: Diagnosis and Therapy Planning Platform for Patients with Cardiovascular Diseases

The care path for cardiovascular patients, ranging from symptom detection to diagnosis to therapy and disease management is fragmented. Providing each patient with the right type of care at the right place of care is a key challenge for each healthcare system. In a fragmented cardiovascular care protocol, quality and efficiency of care suffers.

Team Cardio Prime develops an innovative Digital Health platform for diagnosis and therapy planning to inform and improve the care path for patients with cardiovascular diseases. The solution enables physicians working in cardiovascular and other specialties at hospitals to make more informed care path decisions. The first application is a stress test of cardiac and heart valve function without pharmaceutically or physical activity-induced stress. Other opportunity areas are complementary cardiovascular analyses and decision-support systems for cardiovascular diagnosis and therapy planning. Due to regulatory requirements on clinical validation, the development path turned out not to be feasible.

Team Cardio Prime consists of an interdisciplinary team of experts in cardiovascular disease diagnostics and treatments, physicists, engineers and software developers.

Cardio Prime

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KEYWORDS
Cardiovascular Diseases, Care Path Improvement, Prevention, Platform Solution

BodyClock: A New Diagnostic Assay to Assess the Internal Clock

An aligned circadian clock is essential for health. Misalignment or disruption of an individual's inner time relative to their environment, which is highly prevalent in the fast-paced and globalized lifestyles of modern society, are associated with numerous common diseases such as sleep disorders, psychological disorders, metabolic syndromes, rheumatic disorders, cardiovascular diseases, and cancer.

In the emerging field of chronomedicine, team BodyClock addresses this medical need with a blood test to determine the individual's body time by profiling selected genes with specific lab equipment and a bioinformatics algorithm. While as accurate as currently established tests, this solution promises to be less complex, faster, and more cost-effective.

BodyClock consists of experts in the field of chronobiology, medicine, and data-analysis/software development and spun off in 2021 as Bodyclock Technologies GmbH. They are providing the first RNA hair test to identify the individual internal clock.

Spinoff

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KEYWORDS
Chronobiology, Chronomedicine, Internal Clock, Sleeping Disorders, Companion Diagnostic, Clinical Trials, Patient Empowerment

DentalXr.AI: Deep Learning for Dental Image Diagnostics

Dental diseases are among the most prevalent of humankind, burdening billions of individuals with pain, impaired chewing movements, impaired speech and aesthetics. To manage these diseases, early detection and regular monitoring with supportive therapy is needed.

Team Dental Xr.AI developed an artificial intelligence (AI)-based decision-support system for dental images, intended to help dentists to systematically and comprehensively assess X-rays, document these assessments, and form evidence-based decisions. The solution enables faster, more precise and more reliable assessments of dental X-rays. This saves examination time for patients, improves diagnostics and treatment choices, increases the ease of assessment and documentation, and improves patient inflow and management.
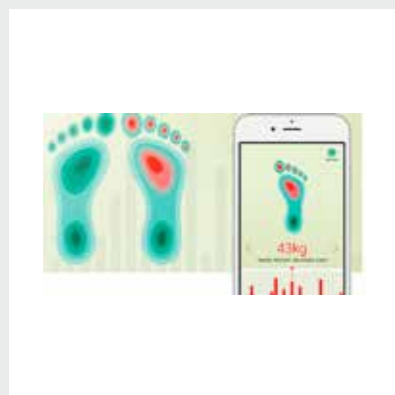
Team Dental Xr.AI consisted of senior clinicians, machine-learning experts and software developers and spun off in 2020. By now they have a fully-automated digital analysis and integrated reporting of dental images (CE certified) to improve therapy recommendation and reduce time. The company was acquired in 2022.

Exit

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KEYWORDS
Dental Image Diagnostics, AI/ML, Dentist Decision-Support System

LingPed: An Innovative Monitoring Platform for Post-Surgical Rehabilitation

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KEYWORDS
Foot Surgery, Post-Surgery,
Rehabilitation, Monitoring System,
Sensor-based Solution, App

Today, a patient's rehabilitation after a foot surgery is not continuously supervised by medical professionals. Instead, the responsibility to control and manage weight load per foot rests with the patient. As medical outcomes depend on both, quality of surgery and quality of rehabilitative process, poor rehabilitation can negatively affect long-term patient outcomes, is dissatisfying for surgeons, and expensive for healthcare systems.

Team LingPed is closing this gap in post-surgical rehabilitation with a monitoring system for patients after foot surgery. The system consists of an insole for use e.g. in postoperative shoes (orthoses) to collect data, and an app for patients as feedback mechanism to monitor and, if needed, adjust their behavior during recovery. This solution intends to reduce the risk of re-surgery, shorten the rehabilitation process for each patient, and reduce healthcare system costs.

Team LingPed consists of trauma surgeons of Charité and has finished its technical testing and is currently preparing its feasibility study within the Charité. In 2019 Lingped was a finalist for the 1A-Award sponsored by 1A Pharma and the Deutsche Apothekerzeitung

mTOMADY: A Transaction Platform for Accessible and Affordable Healthcare

Spinoff

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KEYWORDS
Accessibility of Care, Affordability
of Care, Global South, Healthcare
System Transformation, Financial
Leakage, Mobile Transaction
Platform

More than 1 billion people in low- and middle-income countries lack access to basic healthcare. The majority of affected people do not have access to savings mechanisms and are at risk for unexpected expenses and even medical impoverishment.

Building on the globally present mobile phone infrastructure, team mTomady has developed a digital health wallet – a mobile transaction platform for healthcare credits. Healthcare sponsors can contribute to individuals' healthcare accounts, which in turn can only be used at accredited clinics within defined reimbursement ranges. This solution promises reduced "leakage" of aid funding by international aid organizations, quality improvement and cost-control for governments and healthcare providers, and – most importantly – increased access to affordable, quality healthcare for patients. mTomady is currently live with a pilot in Antananarivo in cooperation with the Government of Madagascar.

Team mTomady consists of two neurologists of the Charité – Universitäts-medizin Berlin and a team of technology, software development and public health experts. In December 2020 the team foundet the mTOMDADY gGmbH. Since 2022 mTOMADY is scaling its activities in Ghana and the two founders, founded with Elucid their second health benefit focussed company.

Spinoff

LIMAA Technologies: Bringing Histopathology from 2D to 3D

No cancer diagnosis is possible without histopathology. Histopathology refers to the preparation and examination of tissue samples in order to study symptoms of a disease.

However, today's histopathology process is restrained. Information on 2D structures such as blood or lymphatic vessels cannot be seen entirely, and pathologists need to examine the sample via "eyeballing," a process requiring a very high level of specialization.

LIMAA Technologies addresses this need by developing an end-to-end histopathology pipeline for improved diagnoses and therapy decisions. The LIMAA Technologies solution consists of two core components: A staining solution and a software solution. The staining solution includes a new staining technology using Nanobodies able to penetrate large tissue samples much faster than traditional staining agents. The software component in development entails a visualization functionality for pathologists to see 3D structures such as vessels, and an indication-specific AI-based analysis functionality to highlight key sample areas. In the future, other use cases will be implemented. Based on these benefits, LIMAA Technologies aims to improve and speed up the clinical histopathology process for better diagnoses and therapy decisions. The project spun-off in 2022.

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KEYWORDS
Pathology, 3D Microscopy, Tissue Staining, AI-Software

ARCAS: AI For Life Sciences, Best Treatment Possible for Every Cancer Patient

Cancer - a disease of the genome - is the second leading cause of death globally. To make cancer treatments more effective it needs to be personalized from diagnosis to treatment. In today's clinical practice, however, the information from the genome is either not used or is used inefficiently.

Team Arcas is building an AI-based diagnostic decision support system for cancer. At the core, the system analyzes complex genomic information: Every cancer biopsy is sequenced not only for mutation detection, but also for large-scale alterations, gene expression, and epigenetic changes. Arcas is using a multi-level deep learning approach to integrate clinical, genomic, and pharmacological data. With this system, Arcas can predict patient cancer subtypes, survival outcomes, and personalized drug response, more precisely. Arcas has shown promising results for colon, breast, and lung cancer.

Team Arcas consists of international experts in the field of bioinformatics, omics data science, from the Institute for Medical Systems Biology at Max Delbrück Center for Molecular Medicine in Berlin and is supported by a season business expert from Pharma industry. Arcas has tested its algorithm with real word data and is currently looking for partnering options with Pharma and Biotech industry.

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KEYWORDS
Oncology, Genomic Data, Artificial Intelligence and Machine Learning, Decision Support Tool

Spinoff

Nephrolyx: Clinical Decision Support System to Identify Acute Kidney Injury

1.7 million deaths per year are caused by Acute Kidney Injury (AKI) globally. AKI is a frequent clinical event occurring in up to 20 % of all hospital patients. Patients with AKI have a significantly higher risk of developing or exacerbating a chronic kidney disease. As of today, an early detection tool for AKI is not available.

Nephrolyx aims to close this gap of early detection with an easy-to-use tool for rapid and precise kidney function measurements. Translating scientific expertise in kidney function measurements to clinical routine, Nephrolyx utilizes a proprietary database, a protocol for contrast agent measurement, and a software to diagnose AKI within the first two to seven hours – reducing the time needed by over tenfold. Nephrolyx is easy to integrate into today's clinical workflow everywhere and, given low component costs, promises a step-changing improvement in both patient outcomes and healthcare system performance.

Team Nephrolyx unites deep expertise in clinical medicine with focus on nephrology, biomedical and laboratory expertise, biostatistics and machine learning. The project spun off in 2022 as Nephrolyx GmbH to reach their aim to uncover the AKI blind spot.

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KEYWORDS
Nephrology, Acute Kidney Injury, Laboratory Test, ICU

Open.IU: A Diagnosis and Therapy Solution for Adolescents with Internet Gaming Disorder

In our digitalized world, a rising number of adolescents are affected by internet gaming disorder (IGD). The WHO defines IDG as the inability to stop playing even though it interferes with other areas of a person's life. IGD is a distressing medical condition, which leads to daily life dysfunction, is associated with psychological and psychiatric issues, and thus needs qualified care.

Team Open.IU has developed an online solution to provide diagnosis and treatment of IGD and co-occurring psychiatric conditions to parties involved. Open.IU consists of an online counseling and therapy tool. The tool provides access to licensed therapists and to modules based on cognitive behavioral therapy. This solution is a low-threshold, easy-to-use service, and makes mental health care accessible for everyone at any time.

Open.IU consists of an interdisciplinary team of experts in psychiatric and psychosomatic diseases, diagnostics and therapy for children and adolescents from Charité – Universitätsmedizin Berlin and School of Medicine at Hofstra/Northwell in New York as well as software developers and designers. In 2020 Open.IU placed second at the 'Digitale Gesundheitspreis' sponsored by Novartis and Sandoz.

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KEYWORDS
Internet Gaming Disorder, Mental Health, Addiction, Diagnosis, Therapy, Online Intervention

PreFree: For Reducing Uncertainty in Pregnancy – A Decision Support Tool and Home Monitoring Solution

Maternal mortality is unacceptably high. As a leading cause of maternal mortality, preeclampsia and related hypertensive disorders of pregnancy claim the lives of nearly 76,000 mothers and 500,000 babies worldwide every year.

PreFree is an AI-based decision support tool for physicians to identify pregnant women at risk for pregnancy complications, especially preeclampsia. The solution aims to support physicians to identify the individual risk for preeclampsia, to decide whether to hospitalize patients in need and to allow patients with low risk to return to their homes. The decision support solution will be complemented by a remote monitoring system that enables women returning home to closely monitor their signs and symptoms with their physicians.

PreFree intends to reduce the risk of false diagnosis, to avoid unnecessary hospitalization, and to reduce healthcare costs by patient-centered remote care in the convenience and support system at home.

Team PreFree consists of a team of medical doctors of the Department of Obstetrics from Charité – Universitätsmedizin Berlin and machine learning and software development expertis. They were the recent recipients of Innofond funding "PreFree - Cross-sector care for high-risk pregnancies using remote monitoring and decision support"

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KEYWORDS
Obstetrics, Preeclampsia, Digital Test, Remote Monitoring Solution

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siloa: Solution for Digital Early Detection of Alzheimer's Disease

Worldwide, at least 50 million people are believed to be living with dementia; a number projected to reach 82 million in 2030 and 152 million in 2050. Dementia is a syndrome associated with deterioration of memory, thinking, behaviour, and the ability to perform everyday activities. Early detection and lifestyle interventions are believed to improve quality of life.

Team siloa is working on a digital test for the early detection of Alzheimer's disease to intervene in the disease progression. For the test, the team is developing a digital biomarker, combining software-based tests that engage brain areas known to be affected in very early stages of Alzheimer's disease. The test will be initiated by a physician and then conducted by the patients in the comfort of their homes for 15 minutes per day over the span of a month. An Alzheimer's probability score will then be transferred directly to the physician to maximize certainty for their patients and their caregivers. Siloa wants to enable a future where early detection of Alzheimer's disease.

Team siloa consists of clinicians and researchers in geriatric medicine at the Memory Clinic at Charité.

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KEYWORDS
Alzheimer's Disease, Early Detection, Digital Test, Real-Time Monitoring

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SUMUS: A Physiotherapy Guide for Patients Affected by Muscle Diseases

Muscular Dystrophy (MD) is a progressive condition is often at first affecting a particular group of muscles and deteriorates them over time. Some types of MD eventually affect heart muscles or breathing-related muscles, at which point the condition becomes life threatening.

Patients affected by muscle dystrophy need personalized physiotherapy to maximize their quality of life and potentially decelerate the progressive condition. In Germany and Europe, only a few physiotherapists are trained to provide this expert service.

SUMUS offers an alternative via a virtual physiotherapist tool that guides muscle patients to a well-balanced life. The individualized training syllabus is devised by a physician and a physiotherapist in close coordination with the patient. Another part is the SUMUS Smartwatch application that tracks any active movement of the patient's arms (initial prototype) in daily life and then suggests whether to train, which exercises to use, and to what extent. This mutual feedback feeds into a self-learning algorithm to ensure continuous optimization of the patient's fatigue monitoring and training.

SUMUS combines interdisciplinary expertise in neurology, muscle dystrophy diagnosis and therapy research at Charité and MDC, physiotherapy, computer-aided medical robotics, and game-based learning. Sumus is currently in the process of founding a company.

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KEYWORDS
Muscular Dystrophy, Guided Physiotherapy, Digital Health Solution, Home Monitoring

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KEYWORDS
Anesthesiology, Perioperative Monitoring, MedTech

Aurelia: To Monitor Brain Perfusion during Anesthesia and Improve Perioperative Outcomes

During surgery, the anesthesiologist is the guardian of patient safety and protects physiological homeostasis. Currently, this is done via various invasive and non-invasive devices that monitor physiological biosignals. Unfortunately, millions of patients undergoing mid to high-risk surgery experience perioperative complications, which only emerge later after the anesthesia wears off.

Although the anesthesiologist is equipped with multiple monitors, no system currently exists to track global brain perfusion non-invasively and effectively. Charité Anesthesiology and their technology partner SectorCon have developed Aurelia, a prototype sensor-based system that non-invasively tracks brain perfusion. This system can provide vital information and be a powerful asset for the everyday anesthesiologist, enabling them to implement personalized hemodynamic strategies, maintain adequate brain perfusion, and ensure optimal physiological homeostasis.

Project Aurelia is powered by an interdisciplinary team of anaesthesiologists that are pushing for pioneering the development of non-invasive anesthesia monitoring for the digital age. Aurelia aims to be the go-to solution in every operating room to reduce perioperative complications. The team went back to conduct further research on the tech and modeling side.
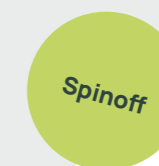
MetaboKin: A Virtual Cell for Modeling Liver Metabolism

Non-alcoholic fatty liver disease (NAFLD) affects more than 25 % of the world's population. Metabolic syndrome manifests in the liver as NAFLD and develops into more severe disorders like non-alcoholic steatohepatitis (NASH). Despite pharmaceutical companies' significant efforts in recent decades, there is still no available drug treatment for NASH.

Team MetaboKin has developed virtual cells that simulate central metabolism with kinetic properties from approximately 400 metabolic enzymes and transporters. Over the last four decades, biochemists gathered kinetic data which, today, enables realistic in silico representations of organ metabolism.

MetaboKin is the ideal tool to characterize metabolic changes in NASH, improve drug target identification, further differentiate between mechanisms of action, and support patient stratification. The tool analyzes proteomics data from tissue samples and provides functional insights into central metabolic pathways, which enables the comparison between clinical and pre-clinical samples. The project spun off in 2022 and is offering services in the field of next-gen proteome profiling for diverse disease areas.
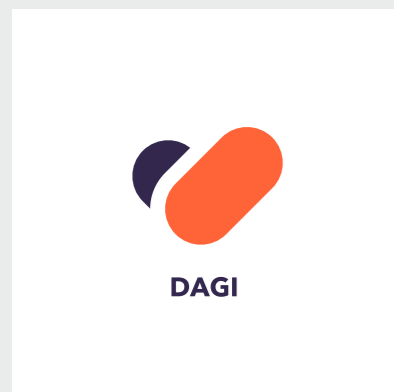
Spinoff

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KEYWORDS
Proteomics, Metabolism, Kinetic Models, Simulation, NASH, Pharma R&D

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KEYWORDS
Pediatric Cardiology, Congenital, Heart Disease, Remote Monitoring

DAGI: Keeping Your Child With Congenital Heart Disease Safe at Home

Congenital heart disease is the most common birth defect in humans, affecting 1 in 100 newborns. Advances in cardiovascular medicine and surgery have led to a steep decline in mortality in Western Europe in the past three decades. Improved survival leads to new challenges: Children with the most severe heart defects need close medical surveillance and therefore stay in hospital for several weeks, months, or even years. This prolonged hospitalization is associated with significant costs for health insurances, hospitals, as well as a high emotional burden for affected children and their families.

In order to improve care for these vulnerable patients, DAGI developed a remote patient monitoring app, facilitating earlier discharge and ensuring medical surveillance at home. The DAGI app is tailored to the specific needs of patients with congenital heart disease and combines daily monitoring of vital parameters, medication plan, information & chat function with a state-of-the-art interface for health professionals.

DAGI's mission is the improvement of medical care and quality of life for children with congenital heart disease. Our executive team combines passion for medical innovation with world leading clinical and scientific expertise.
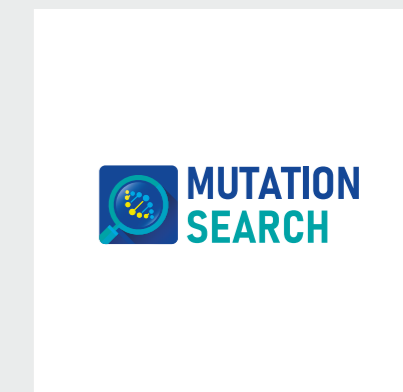
MutationSearch: Making Whole Exome Sequencing Accessible

Whilst most of the 6,000+ single gene disorders are rare, more than 200 million humans suffer from any of them. Due to their rareness, they are difficult to diagnose.

High-throughput sequencing technologies such as Whole Exome or Genome Sequencing (WES/WGS) allow the identification of disease-causing DNA mutations with a single assay. With the falling costs of these approaches, they will become a routine diagnostic procedure in the very near future.

With MutationSearch we aim to bring WES/WGS to clinics and industry, as a one-stop shop for the discovery of the molecular causes of genetic disorders. We will provide certified software that analyses raw data from DNA sequencers, finds variations from the reference genome (~40,000/patient in WES and ~4,000,000/patient in WGS), and predicts their pathogenicity, even without a clinical diagnosis. Medical doctors can provide as much information about the patient's phenotype as they have, thereby allowing the software to focus on variants in genes which are likely to cause the disorder. MutationSearch will automatically print a report including all information needed by physicians for a molecular diagnosis.

MutationSearch's interdisciplinary team combines expertise in bioinformatics, computer science, molecular medicine, biochemistry, and machine learning. The team is currently working on their business case and is looking for partnering possibilities with industries in the field of whole genome sequencing.

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KEYWORDS
Whole Exome or Genome Sequencing (WES/WGS), Bioinformatics, Translational Genetics

Pre-Spinoff

MyaLink: A Monitoring Platform Solution for Orphan Diseases in Neurology

Team MyaLink has developed a solution to provide better care for patients with neurological orphan diseases. MyaLink believes that every patient—no matter the rarity of disease—should have access to a specialist when they need one. Physicians should be able to monitor patients over time and react to acute events when necessary.

The team has developed a platform solution for neurological orphan diseases that remotely monitors patients' vital parameters and tracks their condition daily. Over time, physicians can get a better overview of disease progression, rather than a quick snapshot during an in-person visit. MyaLink can help prevent expensive crises and ICU stays through the early detection of severe situations. The real-world data can also be very valuable for novel orphan drug development and post-market surveillance.

MyaLink is powered by a team of neurologists and researchers and is part of the largest nationally certified integrated myasthenic center in Germany. MyaLink works with German Myasthenia Association. MyaLink won the Health-i Award 2021 powered by TK and Handelsblatt.

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KEYWORDS
Remote Monitoring, Telemedicine, Digital Platform Solution, Myasthenia Gravis, Orphan Disease; Empowerment

QoL-O-Mat: Establishing a Health-Related Quality of Life Software-As-Service Assessment Platform

The German PROMIS® National Center is presently projected to provide more than 27,000 Patient Reported Outcomes assessments in the next 5 years. It has become evident that the unmet need is the lack of a proficient software solution. In 2016, the PI established the GPNC at the BIH-Charité. This implies, in cooperation with the US Department of Mental Health and PROMIS® Health Organization (PHO), the FDA validated translation of ›1200 questions for over 30 domains of life into German, the establishment of the German PROMIS® National Center and exclusive distribution rights for German speaking countries.

The lack of a proficient software-as-a-service solution for PROMIS® has become evident in cooperation with industrial and non-industrial partners with hospitals and patient advocates alike. This is critical, as the PROMIS® system is the only system that validly assess people of all ages, diseases and nations alike (presently translated into English, Dutch, Spanish, Chinese and German), efficiently. The NIH and FDA ratify and prefer PROMIS®, but quality standards apply also to the mode of assessment and presentation in German for old and young alike.

The QoL-O-Mat Team has been working on building a software solution to fill the gap to collect real word evidence on the QoL in Germany. The team is currently working on translating and validating patient repoted outcomes further and clarifying legal pre-conditions.

QoL-O-Mat

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PerMitrA: Optimization Tool for Heart Valve Surgery

In Europe, mitral valve regurgitation is a heart condition that affects 2.4 % of adults over age 40. As the heart contracts, blood flows into the systemic circulation, but for those with this condition, blood also problematically flows backward into the atrium because the valve can no longer close. As the condition progresses, heart failure and dyspnea are the consequences. The standard therapy is surgery. Here, annuloplasty rings can be used to reduce the valve's diameter to allow the valve leaflets to close again.

PerMitrA was developed to support surgeons' choice of the optimal ring model/ size, streamline clinical decision-making, and improve patients' outcomes postprocedure. PerMitrA combines image-based models of a patient's unique heart structure with digital models from commercially available annuloplasty rings. The key technology is a fast geometric simulation that shows how a particular ring model would change the anatomy of a patient's heart. This tool allows surgeons to simulate personalized strategies before surgery and to visually demonstrate them for discussion, both with the team and with the patient.

PerMitrA is powered by a team of cardiac surgeons and AI experts with complementary core competencies and a shared understanding of how to improve cardiac interventions. Due to liability questions on the legal and procurement side, the development path turned out not to be feasible.

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KEYWORDS
Heart Valve Surgery, Artificial Intelligence, Therapy Simulation, Decision Support Tool

rAIdiance: AI-Based Radiology Solution to Improve ICU Care

Radiographs play an important role in answering diagnostic questions in medicine. In the intensive care unit, patients may receive a new radiograph every day. However, if expertise is lacking, the error rate is correspondingly high. It would be desirable if the radiologist would immediately assess every image, but this is not the case in many hospitals. As a result, on-site medical staff who do not have the knowledge of a radiology expert must perform image interpretation.

With the AI tool developed, team rAIdiance aims to help physicians in the intensive care unit with image interpretation when radiologic expertise is not available. The goal of team rAIdiance is to make physicians better and more confident in analyzing radiology images. We are developing an AI solution to help image interpretation by highlighting important image areas and quantifying findings, particularly focusing on the intensive care unit.

rAIdiance is an interdisciplinary team of experts with several years of experience in radiology and AI development. rAIdiance technology is based on a high quality annotation set of over 4.000 images so far. The team is looking for interested parties in their thechnology stack.

rAIdiance

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KEYWORDS
Radiology, AI, Decision Support Tool, ICU, ER, Medtech

Spinoff

RECOVERYCAT

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KEYWORDS
Psychiatry, Remote Monitoring,
Mental Health, Chronic Mental
Illness, Decision Support Tool,
Digital Therapy, Adherence

Spinoff

Time Teller

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KEYWORDS
Circadian Clock, Oncology,
Computational Biology

Recovery Cat: Keeping Patients with Chronic Mental Disorders Safe

Recovery Cat is a digital application providing decision support for outpatients with severe mental diseases (schizophrenia, bipolar disorder and recurrent depression) and their physicians. Unfortunately, many drugs only work for a few patients. To decide whether a patient responds to a drug and the treatment should therefore be continued or changed, physicians have to disentangle the time course of life events, symptoms, side effects and drug intake.

By tracing patients' individual target symptoms, drug intake and side effects, Recovery Cat aims at early detection of non-response, side-effects, and determining patients at risk. Recovery Cat is a customizable patient monitoring and therapy support app, in its core and is directly integrated into a running therapy, and reimbursed via selective contracting since 2023. It enables patients and doctors to decide together with the help of the evaluation dashboard. Patients can better understand the relationship between symptoms and medication, and feel more confident with their treatment.

The highly interdisciplinary and experienced team from psychiatrists, psychotherapists, product strategists, over techies and UX/UI designers spun-off in 2022.

TimeTeller: Circadian Clock Profiling for Timing Treatment in Cancer

The circadian clock is our internal time-generating system that rules our sleep/wake cycles and molecular processes like metabolism and cell division. We all have our own personal circadian clock, which means metabolism and cell division happen at different times of day for each of us. Furthermore, while over 50% of FDA-approved drugs target 24h-rhythmic genes, but currently these circadian rhythms are not taken into consideration in clinical care.

The TimeTeller team has developed a method for profiling the personal circadian clock and predicting the optimal time windows for a given drug and patient. The TimeTeller solution offers a non-invasive at-home testing kit, a patient biomarker monitoring tool and a clinician decision support tool.

The TimeTeller platform can ultimately be applied across clinical indications, from cancer to neurodegenerative diseases, diabetes and more. We are currently participating in clinical studies on ovarian and colon cancer and have planned studies starting in 2021 on pediatric leukemia and Parkinson's Disease.

The team is the recipient of 12 awards, including the 2024 Newcomer of the Year award by the German Startup Awards.

WePath: A Platform-Based Global Network for Pathology Expertise

Pathology is the study of human disease, a specialty is central to medicine. In recent years, the workload of pathologists has steadily increased, and the complexity of their work is going up because of precision diagnostics and personalized therapies.

The WePath platform helps the pathology community to use these new opportunities by providing instant access to the collective expertise worldwide. This takes pathologist collaboration to an entirely new level where incoming and outgoing cases together with integrated real-time or asynchronous conversations are available at their fingertips.

At the same time, this community also opens up entirely new, vast potential for conducting preclinical and clinical trials as well as for the clinical validation of AI solutions. For digitized studies, cases and their specimens together with the generated data are available and fully managed within the platform. While minimizing organizational burden and assuring regulatory compliance, WePath gives pharmaceutical and AI companies access to the expertise of human diagnostic pathologists.

In the interdisciplinary WePath team, pathologists, mathematicians, biochemists and computer scientists are working together to build the WePath platform.

WePath

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KEYWORDS
Pathology Diagnostics, 24/7
Expertise, Platform, Digital Trials, AI
Validation

Pre-Spinoff

GYDE

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KEYWORDS
Womens Health, Sexual Medicine, Gynecology, FemTech, Sexual Dysfunction, Digital Health, Patient-Centered

GYDE: Patient-Centered Therapy Solution for Sexual Distress in Women

For the millions of women in Germany and the EU affected by gynecological conditions, such as endometriosis, breast cancer, gynecological cancers, lichen sclerosis, vulvodynia, or menopause, up to 90% of them will also then be affected by a secondary condition, sexual distress. This secondary, life-impacting condition, while caused by the first cannot be cured by using the same therapies, interventions, or approaches. There is an evidence-based treatment for sexual distress that should be offered to all of these women but simply isn't. The clinic at Charité is one of only 3 in Germany equipped with a team of professionals to deliver sexual distress therapy to women. Due to the lack of care, only 1% of the women who are looking for help can be treated, leaving 99% of women suffering for a prolonged time and it could be avoided.

Team GYDE has brought their evidence-based therapy digital so it is accessible to women, wherever they are. GYDE's first treatment is focused on just one gynecological condition and treatment of the related sexual distress condition: Endometriosis. We will then expand the product to offer therapy to more gynecological conditions and serve the 66 million women looking for help for sexual distress every year in the EU. GYDE is developed by an interdisciplinary team of experts in sexual medicine, gynecology, and psychology. The team is close to finishing its clinical validation with over 100 women and is in the process of spinning off.

METATRON: A Wearable Sensor Platform for the Early Detection of Peripheral Artery Disease

As the population ages, the prevalence of Peripheral artery disease (PAD) continues to increase. In Germany alone, approximately 2.3 million people suffer from PAD, resulting in exorbitant costs for the national health system. Today, treatment is delayed most significantly due to unrecognized disease progression by the patients.

METATRON is a wearable, non-invasive sensor device placed on the calf of PAD patients. After initial setup with a vascular specialist, the patient simply needs to actively utilize the wearable for only a few minutes each week. The system reliably detects deterioration of limb perfusion, serving as an "early warning system" for worsening PAD. With growing use, METATRON can analyze perfusion patterns using a dedicated machine-learning algorithm in order to detect PAD deterioration before it manifests.

METATRON is powered by an experienced and highly motivated interdisciplinary team of interventional radiologists, engineers and data scientists with complementary core competencies and a shared understanding of how to improve the management of PAD patients. The team is currently in Stage 2 of the program, has finished it prototype and is in the recruitment for its prospective validation.

Stage 2

METATRON

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KEYWORDS
Radiology, Sensors, Peripheral Artery Disease, Early Detection, Disease Management Program

MatchGraft.AI

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KEYWORDS
Oncology, Transplantation, Stem Cells, AI, GvHD, Donor-Matching, Malignant, Non-Malignant

MatchGraft.AI: Donor-Patient Matching Tool for Stem Cell Transplantations and Beyond

Stem cell transplantation (SCT) remains for 90% of patients the curative treatment option for many hematologic diseases in children and adults. The number of performed SCTs has almost doubled in the last ten years with 3,600 SCTs in Germany and 20,000 SCTs in Europe per year. Despite major improvements over the last decades, donor-patient matching is still slow and insufficient. SCT holds severe, possibly life-threatening complications such as Graft-versus-Host Disease (GvHD), relapse of malignant disease, rejection, and infections. In GvHD, transplanted immune cells recognize the recipient's organs as foreign and attack them. Due to insufficient donor-patient matching as well as unsatisfactory first-line treatment and a lack in the standard of care for a second-line GvHD treatment, up to 50% of the patients undergoing SCT will develop GvHD resulting in high morbidity, mortality (up to 90% for severe GvHD) and treatment costs after SCT.

MatchGraft.AI will revolutionize donor matching by building and applying an AI-based tool. Its first use case is the prediction of the development of a GvHD after matching to decrease the rate and severity of the disease by optimizing GvHD prophylaxis and facilitating earlier treatment. The MatchGraft.AI solution focuses on better matches, faster, improves clinical decision-making, and reduces mortality for children and adults

MatchGraft.AI is built by an experienced team in clinical hematology, oncology, and stem cell transplantation, supported by machine learning and scientific advisors.

mucoaid: AI-Powered Solution to Detect Oral Mucosal Lesions Early To Fight Oral Cancer

Oral cancer has a death rate higher than that of cervical cancer, Hodgkin's disease, brain, liver, and skin cancer. One of the real dangers of this cancer is that in its early stages, it can easily go undetected with severe consequences for the survival.

mucoaid detects and classifies oral mucosa lesions in photographs taken by dentists using machine learning algorithms for diagnostic decision support. By uploading images acquired with an intraoral camera onto mucoaid's application, a quicker diagnosis is achieved. The application shortens the interval between the onset of symptoms and the start of treatment, while also guiding patients and dental professionals throughout diagnosis, treatment, and aftercare. mucoaid supports the observation of chronic diseases, assists in cancer aftercare, and includes patient-reported data to lower the risk of malignant transformation and/or recurrence.

Team mucoaid is powered by the expertise of a senior clinician and researcher in the field of digital imaging and computer-aided treatment planning in oral and maxillofacial surgery, dentists from Charité and Einstein Center Digital Future, Berlin supported by a machine learning and a business expert. mucoaid is currently in the spin-off process.

Pre-Spinoff

mucoaid

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KEYWORDS
Dentistry, Digital Imaging, AI, Decision Support Tool, Oral Cancer, Oral Surgery

Pre-Spinoff

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KEYWORDS
Radiology, Specialized Radiology, AI, Ophthalmology, Diagnosis Support, Image Analysis

RadioEye: The Autopilot in Diagnosing Misleading Radiology Cases Correctly

Interpretation of radiological images is core in diagnostic radiology. However, the medical world has grown in terms of complexity and broadness. In 10´35% cases, the radiologists consults various sources for reverence to be able to interpret the image correctly.

RadioEye closes this gap by offering diagnosis support with the help of a reference tool. Designed as an interactive case collection, the tool offers curated information and a vast database of reports and radiological images of cases. It additionally assists with an AI-based image-search functionality that helps find similar cases based on image features alone and by ranking narrowing potential diseases down. Radiologists can swipe through images and compare them to the case at hand. The product offers an eye and eye socket module, tested already in clinical setting and expands its features currently to the brain.

A curated radiology database that covers the real-world variance of disease presentation together with a powerful image-search functionality is unique and aims to improve quality and efficiency in diagnostic radiology worldwide. RadioEye is powered by an interdisciplinary team with years of experience in radiology and specialized radiology, AI and software development, and business the team is currently finalizing the company founding process.

VirtuCueR: A VR-Based Treatment to Reduce Relapse & Craving For Alcohol-Dependent Patients

In Germany alone, 1.6 million people are alcohol-dependent. Affected individuals often suffer from health issues, unemployment and social exclusion. Crucially, alcohol dependence is characterized by its chronicity, with relapse rates up to 80 percent after rehabilitation treatment.

One way to address alcohol dependency is by re-directing the craving response. Cravings are often experienced in situations that remind the individual of alcohol intake, such as, the local pub or informal gatherings of social groups. However, most therapies for alcohol dependence do not incorporate these real-life situations in the therapeutic process.
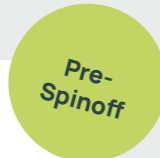
VirtuCueR aims to overcome this limitation by using virtual reality to expose affected individuals to personalized high-risk situations that elicit craving. During this treatment, patients wear a head-mounted display that exposes them to alcohol-associated environments. The experience and the interaction with the environments can be controlled and adjusted by a therapist. The overarching aim of the treatment is that patients can acquire specific skills to overcome craving.

The VirtuCueR is a multi-professional team consisting of psychiatrists, psychologists and scientists from Charité and a partner institution which specializes developing virtual-reality treatments. The team is currently in the spin-off process.

Pre-Spinoff

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KEYWORDS
Alcohol Addiction, Exposure Therapy, Virtual Reality, Relapse, Craving

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KEYWORDS
Oncology, Breast Cancer, ILB, Patient-Centered Care, Personalized Treatment, Integrated Care, DMP

SangoRT: Making A Change for Clinical Trials in Oncology

Clinical trials are instrumental for bringing new treatments to patients. Despite this fact, less than 5% of eligible patients participate in clinical research due to the disturbances they pose to patients' daily life. In addition, up to 20% of trials are either withdrawn due to patient recruitment problems or completed with a reduce target population. These problems greatly impair trial quality data, prolonged timelines and as a result add to the overall costs of trials.

SangoRT tackled this challenge by developing a cost-effective, home-based IVD medical device for remote monitoring of blood counts and common side effects of drugs. By automating and optimizing the workflow of blood tests for side-effect monitoring, the team works towards enabling virtual and hybrid clinical trials, e.g., in oncology. The team's goals are to increase the right patient recruitment and retention rates by reducing the burden of clinical trials on the patients, and to enrich the data insights by enabling more frequent sample collection.

SangoRT team is composed of a clinical researcher, a medical doctor, a computational biologist supported by an oncologist/ hematologist. Its mission is to optimize clinical trials in order to get new effective treatments to patients faster and more cost-effective.
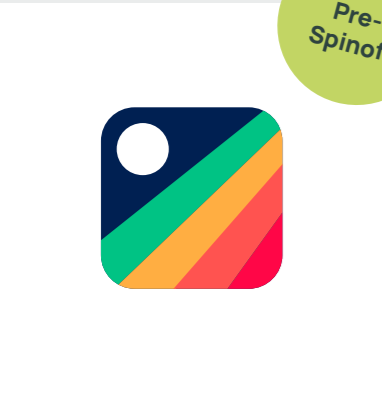
Pre-Spinoff

Stage 2

dotPD: A Customizable Platform for Data Driven Medicine

Despite new digital health solutions being invented almost every day, very few actually see any action. In reality, myriad considerations, including interoperability, security, and standardization, create a logistical hurdle not easily bypassed. That's where dotPD's dotbase comes in.

The dotbase solution provides a unique workspace for building and operating countless digital health solutions efficiently and effectively. New customized dashboards or patient applications can be seamlessly assembled using its modular and interoperable design with best-in-class features and no-code/low-code adjustability. Today, the solution already powers a wide range of applications, including comprehensive remote patient monitoring platforms, integrated multi-centric clinical trials, and entire hospital outpatient clinics at Charité.

The dotPD team aims to revolutionize the digital health, landscape by making it faster, more reliable, and cost-effective for everyone to build and run regulated digital health solutions in the real world. Powered by a growing team of proficient software engineers, medical doctors, UI/UX designers, and health economic specialists, dotPD is driven by the belief that the digitalization of healthcare has to be rapid, adaptive, and universally accessible.

metis: An AI-powered PoC Solution for Verifying the Antibiotic Need

According to the Centers for Disease Control and Prevention, about one-third of antibiotic use occurs in situations when it is unnecessary or not the appropriate treatment. This overuse of antibiotics drives an increase in antibiotic-resistant bacteria, which the WHO classifies as one of the top ten threats to global health. METIS seeks to address this overuse via an AI-powered PoC solution capable of identifying the antibiotic need directly at the GP's office.

metis measures multiple key proteins to gain insight into how the patient's immune system is responding to an infection with a simple test device, similar to lateral flow tests that we are familiar with from COVID-19 testing. After metis pools multiple sources of information, the test result can be quickly read by a GP via a smartphone app that relies on AI algorithms to process the results. The whole process takes only a short amount of time and does not require specialized hardware or sending samples offsite, making it perfect for every outpatient setting.

To design metis, an interdisciplinary team from emergency and laboratory medicine spent years evaluating the current and next-generation infection tests clinically and inpatient settings. Combined with their biobank and AI expertise, metis is perfectly positioned to bring infectious disease diagnostics to the next level.

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KEYWORDS
Healthcare IT, Open Platform, HIS, Data-Driven Medicine, Customizable Health Reporting, No-Code/Low-Code

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KEYWORDS
PoC Solution, Antibiotic Resistance, Adults, Children, AI, GPs, PEDs, Diagnostics

Stage 2

Stage 2

IDA: Enabling Streamlined, Personalized Breast Cancer Care

IDA offers an innovative and interoperable platform solution for physicians and healthcare teams treating breast cancer. By wading through the ocean of relevant information and treatment options, IDA enables personalized care pathways that are multidisciplinary in their approach and comprehensive in their considerations.

To achieve this, IDA integrates relevant information such as standardized reporting systems, electronic medical records, tumor board information, patient-specific data, treatment guidelines, and research evidence into a single organized location. Consequently, IDA has the ability to identify complications early on and facilitate timely interventions, leading to better health outcomes and lower treatment costs.

The collaboration between leading breast cancer specialists from Charité, digital health enthusiasts, and a design team specialized in healthcare design highlights the multidisciplinary and patient-centered nature of IDA. By centralizing and making transparent key real-time information about the patient, IDA has the potential to make a significant impact in improving breast cancer care, enhancing patient experiences, and optimizing treatment outcomes.
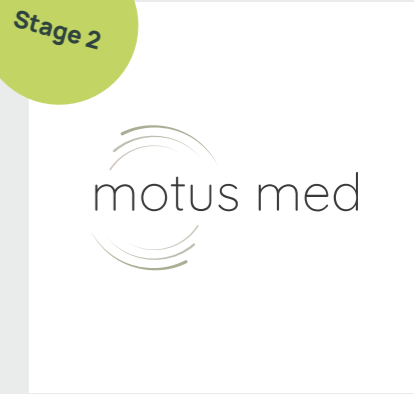
motus med: Transforming Early Age Epilepsy Diagnosis Via Accessible & Intelligent Movement Analysis

During their first two years of life, about 10% of all toddlers exhibit unusual or "strange" movements. In fact, Infantile spasms (IS) are the most common epilepsy syndrome in this age group with an incidence of 1:2500. Motus med utilizes the power of AI-technology and smartphone-based videos to speed up the oft-delayed timeline of the IS diagnosis. motus med's seizure detection technology is developed using large-scale, expert-labeled datasets, has been proven to work with videos recorded from smartphones, and benefits further from previous validation in a multi-center home video monitoring trial that was previously led by our team (G-BA Innovationsfonds).

motus med aims to not only shorten the time to diagnosis for toddlers with suspected seizures, but also reduce the chance of life-long impairments and costs. In the long term, the team is working toward becoming a medical video-based diagnostic platform not only for epilepsy, but also for other neurological conditions.

Team motus med consists of experienced neurologists and data scientists from Charité and BIH with long-standing international and award-winning expertise in AI applications across the epilepsy diagnostic pathway, including video analysis, wearable technology, and EEG diagnostics, and an extensive network with leading academic centers, insurance providers, as well as patient support groups.

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KEYWORDS
Oncology, Breast Cancer, ILB, Patient-Centered Care, Personalized Treatment, Integrated Care, DMP
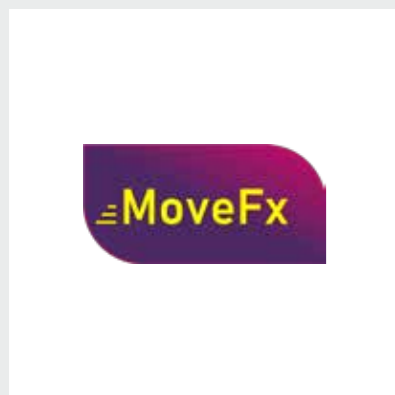
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KEYWORDS
Neurology, Epilepsy, Pediatrics, Seizure, AI, Video Analysis, Diagnosis Support

MoveFx: Bone Fracture Simulation Tool for Orthogeriatrics

Bone fractures are more common among the elderly, and the healing process can be complex and critical in this population. Recognizing the significance of movement in life, MoveFx is a tool that supports after-care physicians in scheduling post-operative activity. By analyzing the patient's activity level prior to fracture, the X-ray images of the fracture, fracture treatment, and patient anatomy, MoveFx predicts the range of tolerable forces at different points in time during the healing process. The tool then enables the geriatric aftercare teams and caregivers to mobilize patients to their pre-operative activity level as early as possible while simultaneously avoiding overloading the healing fracture zone.

MoveFx's vision is to bring the benefits of individualized, quantitative analysis of the interaction between physical and mechanical factors directly into the care path. To make this possible, MoveFx relies on an interdisciplinary team of engineers, software developers from BIH, and the Julius Wolff Institute, Charité, all embedded in a broad network of international clinical and research partners.

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KEYWORDS
Orthopedics, Geriatrics, Surgery, Bone Fractures, Simulation, Implants, Rehabilitation

UroMe.ai: An AI-Based Tool for Personalized Treatment in Urological Cancers

Bladder cancer is the fifth most common cancer in Europe, accounting for 5% of total European healthcare cancer costs.

With the power of AI tools, molecular data, and patient-derived organoids, UroMe.ai aims to predict treatment response and make personalized bladder cancer treatment an everyday possibility. By accurately predicting treatment responses, UroMe.ai can in turn additionally assist clinicians and tumor boards in making informed decisions regarding a given treatment modality, therapy outcomes, and potential quality of life for patients with bladder cancer.

UroMe.ai's unique process works by training an AI algorithm on personalized organoids that utilize only molecular data.
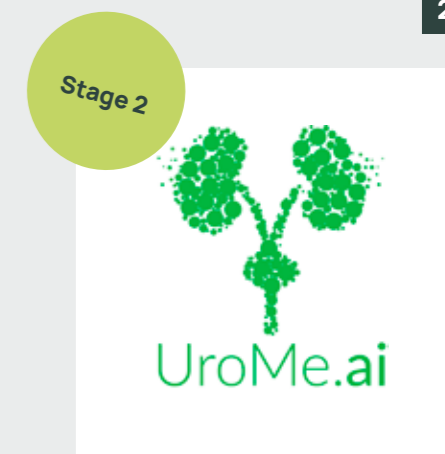
The UroMe.ai team combines the expertise of internationally recognized senior researchers and clinicians from the Charité in the field of urology and patient-derived experimental models alongside technical experts in machine learning. In the future, UroMe.ai aims to be the standard of care tool used not only in all clinically approved oncological treatments of bladder cancer – but also in other urological cancers.

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KEYWORDS
Urology, Urogyn, Cancer, Bladder, AI, Organoids, Chemotherapy, Treatment, Malignant, Decision Support

myne: A Personalized Treatment Support Tool for MCI

Up to 20% of people above the age of 65 years suffer from an abnormal decline in memory and related brain functions. Mild cognitive impairment (MCI) substantially decreases the quality of life of the affected and presents an emotional and financial burden to their loved ones, who typically perform informal care. Unfortunately, MCI currently has no approved treatment.

myne aims to put the latest advances in personalized neuromodulation directly into the hands of users being affected from MCI. After initially obtaining the frequency of brainwaves using behavioral input alone, myne can then deliver personalized brain stimulation. This is achieved by playing sequences of sounds, heard simply through a conventional pair of headphones, without requiring any additional devices. State-of-the-art research shows that personalized electric brain stimulation can, using expensive laboratory equipment and trained experts, preserve the existing memory level.

Team myne has been built by experts in deep brain stimulation and psychiatry working at the interface between research and clinical practice. In the future, myne aims to become a platform for deviceless, personalized auditory neuromodulation and become a scalable and accessible solutions that benefit patients with brain disorders.

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KEYWORDS
Neurology, Psychiatry, Aging, Memory, MCI, Early Dementia, Treatment Support, Audio, Deep Brain Simulation

Supported Projects from 2017 – 2023

Cohort 2017

- **Exploration of Heart Disease and Cancer Using Fractal Analysis Technology**
  Dr. Florian Michallek, Institute of Radiology, Charité

- **Heart Disease Risk App and Automated CT Analysis**
  Prof. Dr. Marc Dewey, Institute of Radiology, Charité

- **Predicting Stroke Risk with Artificial Intelligence**
  Dr. Dietmar Frey/Dr. Vince Madai, Neuro Surgery, Predictive Modeling in Medicine, Charité

- **Prediction of Post-operative Complications in the Intensive Care Unit (Spinoff X-Cardiac)**
  Dr. Alexander Meyer/Prof. Dr. Volkmar Falk, Department of Cardiothoracic and Vascular Surgery, Charité & DHZB

Cohort 2018

- **BodyTime: A New Diagnostic Assay to Assess the Internal Clock (Spinoff Bodyclock)**
  Prof. Dr. Achim Kramer, Institute for Medical Immunology – Chronobiology, Charité

- **Cardio Prime: Diagnosis and Therapy Planning Platform for Patients with Cardiovascular Diseases**
  Prof. Dr. Titus Kühne/Kai Brosien, Institute for Imaging Science & Computational Modelling in Cardiovascular Medicine, Charité

- **Computational Pathology (Spinoff aignostics)**
  Prof. Dr. Frederick Klauschen, Institute for Pathology – Clinical Pathology, Working Group System Pathology, Charité

- **DentalXr.AI: Deep Learning for Dental Image Diagnostics (Exit: DentalXr.ai)**
  Prof. Dr. Falk Schwendicke/Departement of Restorative and Preventive Dentistry, Charité

- **LingPed: An Innovative Monitoring Platform for Post-Surgical Rehabilitation**
  PD Dr. Serafeim Tsitsilonis/Kaya Nevda, Center for Musculoskeletal Surgery, Charité

- **mTOMADY: A Transaction Platform for Accessible and Affordable Healthcare (Spinoff mTOMADY)**
  Dr. Julius Emmrich/Dr. Samuel Knauss, Departement of Neurology and Experimental Neurology, Charité

Cohort 2019

- **3D Histopath: Bringing Histopathology from 2D to 3D (Spinoff Limaa Technologies)**
  Dr. René Hägerling, Institute of Medical Genetics and Human Genetics, Charité

- **ARCAS: AI for Life Sciences. Best Treatment Possible for Every Cancer Patient (Pre-Spinoff)**
  Dr. Altuna Akalin, Institute for Medical Systems Biology (BIMSB), Max-Delbrück Center for Molecular Medicine (MDC)

- **Nephrolytix: Clinical Decision Support System to Identify Acute Kidney Injury (Spinoff Nephrolyx)**
  Prof. Prof. hc. Dr. Markus van der Giet, Department of Nephrology and Medical Intensive Care, Charité

- **Diagnosis and Therapy Optimization in Implant Infections**
  PD Dr. Andrej Trampuz, Center for Musculoskeletal Surgery, Charité

- **Open.IU: A Diagnosis and Therapy Solution for Adolescents with Internet Gaming Disorder**
  PD Dr. Olga Geisel/Prof. Dr. Christoph Correll, Department of Child and Adolescent Psychiatry, Psychosomatic Medicine and Psychotherapy, Charité

- **PreFree: For Reducing Uncertainty in Pregnancy – A Decision Support Tool and Home Monitoring Solution (Pre-Spinoff PreFree)**
  Prof. Dr. Stefan Verlohren, Department of Obestrics Maternal-Fetal Medicine, Charité

- **Siloa: Solution for Digital Early Detection of Alzheimer's Disease**
  Dr. Herlind Megges/Dr. Silka Dawn Freiesleben, Department of Psychiatry, Geriatric Medicine – Memory Clinic, Charité

- **SUMUS: A Trustable Psychotherapy Guide for Patients Affected by Muscle Diseases (Spinoff)**
  Prof. Dr. Simone Spuler/Dr. Elisabetta Gazzerro, Clinic for Muscular Disorders, Charité/MDC

Cohort 2020 / 2021

- **Aurelia: Monitoring Brain Perfusion During Anesthesia and Improving Perioperative Outcomes**
  Dr. Michael Nordine/Prof. Dr. Sascha Treskatsch Clinic for Anesthesiology and Intensive Care Medicine, Charité

- **DAGI: Keeping Your Child With Congenital Heart Disease Safe at Home**
  Prof. Dr. med. Katharina Schmitt/Dr. Florian Gross, Department of Pediatric Cardiology and Congenital Heart Disease, Charité/DHZB

- **MetaboKin: A Virtual Cell for Modeling Liver Metabolism (Spinoff)**
  PD Dr. Nikolaus Berndt/Dr. Johannes Eckstein, Laboratory Computational Systems – Biochemistry, Charité

- **MutationSearch: A Full-Service Platform Solution for Whole Exome Sequencing**
  Prof. Dr. Dominik Seelow, Bioinformatics and Translational Genetics, BIH

- **MyaLink: A Monitoring Platform Solution for Orphan Diseases in Neurology (Pre-Spinoff MyaLink)**
  Dr. Sophie Lehnerer/Dr. Lea Gerischer, Department of Neurology and Experimental Neurology, Charité

- **PerMitrA: Optimization Tool for Heart Valve Surgery**
  PD. Dr. Simon Sündermann, Clinic for Cardiovascular Surgery, Charité

- **rAIdiance: AI-Based Radiology Solutions to Improve ICU Care**
  Dr. Keno Bressem/PD. Dr. Dr. Stefan Niehues, Clinic for Radiology, Charité

- **Recovery Cat: Keeping Patients With Chronic Mental Disorders Safe (Spinoff Recovery Cat)**
  Dr. Jakob Kaminski, Department of Psychiatry and Neurscience, Charité

- **TimeTeller: Circadian Clock Profiling for Cancer Treatment Timing (Spinoff TimeTeller)**
  Prof. Dr. Angela Relogio, Institute for Theoretical Biology, Charité

- **WePath: A Platform-Based Global Network for Pathology Expertise**
  Prof. Dr. Peter Hufnagl, Digital Pathology IT, Institute of Pathology, Charité

Cohort 2022

- **Gyde: Patient-Centered Therapy Solution for Sexual Distress in Women (Pre-Spinoff)**
  Dr. Laura Hatzler/Selina Marie Kronthaler, Institute of Sexology and Sexual Medicine, Department of Gynecology, Charité

- **MatchGraft.AI: Donor-Patient Matching Tool for Stem Cell Transplantations and Beyond**
  PD Dr. Lena Oevermann/Dr. Jonathan Groß, Department of Pediatric Oncology and Hematology, Charité

- **Metatron: A Wearable Sensor Platform for the Early Detection of Peripheral Artery Disease (Stage 2)**
  PD Dr. Federico Collettini/PD Dr. Timo Auer, Clinic for Radiology, Charité

- **Mucoaid: AI-Powered Solution to Detect Oral Mucosal Lesions Early to Fight Oral Cancer (Pre-Spinoff)**
  Prof. Dr. Tabea Viktoria Flügge, Clinic for Oral and Maxillofacial Surgery, Charité

- **RadioEye: The Autopilot in Diagnosing Misleading Radiology Cases Correctly (Pre-Spinoff)**
  PD Dr. med. Katharina Erb-Eigner, Department of Radiology MVZ, Charité

- **SangoRT: Making A Change for Clinical Trials in Oncology**
  Iris Wing To Lam, Department of Infectious Diseases and Pulmonary Medicine, Charité

- **VirtuCueR: A VR-Based Treatment to Reduce Relapse & Craving For Alcohol-Dependent Patients (Pre-Spinoff)**
  PD Dr. Stefan Gutwinski/Dr. Nikolaos Tsamitros, Department of Psychiatry and Neurosciences, Charité

Cohort 2023

- **dotPD: A Customizable Platform for Data Driven Medicine (Pre-Spinoff)**
  Andrea Kreichgauer, M.Sc., Department of Neurology and Experimental Neurology, Charité

- **IDA: Enabling Streamlined,Personalized Breast Cancer Care (Stage 2)**
  Prof. Dr. med. Maria Margarete Karsten/Dr. med. Therese Pross, Department for Gynecology with Breast Center, Charité

- **metis: An AI-powered PoC Solution for Verifying the Antibiotic Need (Stage 2)**
  Noa Galtung/ Dr. med Wolfang Bauer, Department of Emergency Medicine, CBF, Charité

- **motus med: Transforming Early Age Epilepsy Diagnosis Via Accessible & Intelligent Movement Analysis (Stage 2)**
  Prof. Dr. med. Christian Meisel/Dr. Gadi Miron, Department of Neurology and Experimental Neurology/ AG Computational Neuroloy BIH, Charité

- **MoveFx: Bone Fracture Simulation Tool for Orthogeriatrics**
  Dr.-Ing. Mark Heyland, Julius-Wolff-Institute, BIH

- **myne: A Personalized Treatment Support Tool for MCI**
  Dr. Orestis Rakitzis, David Haslacher, MSc, Department of Psychiatry and Neurosciences, Charité

- **UroMe.ai: An AI-Based Tool for Personalized Treatment in Urological Cancers (Stage 2)**
  Dr. Annika Fendler/ Dr. Henning Plage, Department of Urology, Charité

Notes

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Stay Tuned. The 2024/2025 Call Opens Fall 2024.

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