PRESS RELEASE

Three Decades of Digital Medicine from Bremen

Fraunhofer MEVIS celebrates its anniversary — and shows how new technologies can improve healthcare

Founded in 1995 as an interdisciplinary research center in Bremen, the Fraunhofer Institute for Digital Medicine MEVIS has since become one of the world's leading institutes in its field. The institute is celebrating its 30th anniversary with several events: On the evening of September 3 a festive ceremony will take place in Bremen's historic town hall, where representatives from politics, business, and science will reflect on the institute's success story and also explore its future outlook. On September 4 international experts will gather at the institute for a symposium on future developments in medicine, focusing on the role of Artificial Intelligence (AI) in cancer care. In the afternoon Fraunhofer MEVIS will then welcome the public and offer interactive insights into ongoing research during an Open House.

Fraunhofer MEVIS develops practical software systems for image- and data-driven medicine, in particular using state-of-the-art AI and deep learning. The goal is to detect diseases earlier and more reliably, to tailor treatments to individual patients, and to make therapy outcomes measurable. To this end the institute works closely with companies from the medical technology and pharmaceutical industries.
"We see ourselves as a transfer research institute. The transition from research to application is often described as a major hurdle, and many scientific results around the globe never reach real-world use," says Institute Director Professor Horst Hahn. "Our role is to build bridges, to bring what is possible into the world and make it available to society."

From Concept to Practice

One recent example is from just over two years ago, when Fraunhofer MEVIS and the Israeli company Techsomed Medical Technologies Ltd. brought a groundbreaking procedure to market: precise ultrasound-guided control for minimally invasive tumor ablation. To advance this innovation, former Deputy Director Professor Tobias Preusser and his team founded Techsomed GmbH in Bremen.
In tumor ablation heat is applied through a fine needle to destroy cancer tissue. Until now the outcome of such procedures was often uncertain. With the new approach interventions can be precisely guided. "With this unique procedure, the destruction of tumor tissue can be monitored in real time," explains Hahn. "Directly after the

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procedure it becomes clear whether the tumor has been completely destroyed, and this can be done with a simple and cost-effective ultrasound device." Traditional methods often left patients with the discovery later that treatment had been incomplete. The new method allows physicians to assess the outcome in real time and, if necessary, adjust the procedure on the spot. Just two years after its introduction, the technology is already in clinical use at several leading hospitals in the United States.

This achievement is significant, as cutting-edge medical technologies often face barriers within Germany's healthcare system. "We need a system that stresses health preservation and efficiency," emphasizes Hahn. He argues that ineffective therapies should be identified and discontinued at an early stage. "Many chemotherapy and immunotherapy treatments are expensive, burdensome, and unfortunately sometimes ineffective," he says. "If we can detect that early, we can spare patients unnecessary side effects, save enormous costs, and most importantly give patients valuable time."

Using New Technologies More Efficiently

Fraunhofer MEVIS methods such as AI-supported image analysis, data integration, and predictive modeling can make this possible. But Germany's healthcare system currently lacks the right incentives. Hospitals are currently reimbursed largely by the number of procedures, rather than their quality or efficiency. "This has to change if we want to keep modern medicine accessible to all," says Hahn. "We already have the technologies, what is missing are the right policy frameworks."

A core research focus at Fraunhofer MEVIS is the development of clinical decision-support systems. These systems combine medical imaging, laboratory data, and research findings to provide physicians with evidence-based treatment recommendations.

Looking ahead, the institute is focusing on so-called multi-agent systems, which are already widely used in industry. These new AI architectures can automatically combine multiple specialized AI modules individualized to each specific case. "This will allow us to analyze more quickly and comprehensively which treatment is best for each individual case, always based on the latest scientific knowledge," Hahn explains. "We see this as a key technology to address the growing complexity of medicine."

Mathematical Roots

The institute was founded in 1995 by mathematician and University of Bremen professor Heinz-Otto Peitgen. The newly created "Center for Medical Diagnostic Systems and Visualization" followed a visionary approach in which experts from medicine, mathematics, computer science, and physics worked together to develop digital tools that would make diagnostics and therapy safer and more effective. A key inspiration came from fractals, a type of geometry that can describe complex organic structures.

"Together with radiology professor Klaus Klose from Marburg, Peitgen was convinced that these mathematical tools could be applied to biological structures such as blood vessels, with tangible benefits for medicine," Hahn recalls.
Over time Fraunhofer MEVIS achieved numerous innovations that found their way into practice. The institute developed a prototype for highly efficient software for digital mammography diagnosis. It enables radiology specialists to quickly and reliably diagnose possible tumors in breast X-rays and is used worldwide. It has been further developed to market maturity and is still marketed today by two companies that emerged from the institute, MeVis Medical Solutions and MeVis BreastCare, which together have created almost as many high-quality jobs in Bremen as the institute itself.
Another success story is the computer-assisted planning of liver surgeries. Especially in complex tumor resections or living liver donations the MEVIS software enables surgeons to analyze a patient's individual vascular anatomy in detail and plan incisions virtually in advance. This minimizes risk and increases success rates. Today the technology is used in surgical centers worldwide.

Originally established as an independent non-profit research center at the University of Bremen, MEVIS grew continuously and built partnerships with companies, hospitals, and research institutions far beyond the region. In 2009 it became part of the Fraunhofer-Gesellschaft as the Fraunhofer Institute for Medical Image Computing, adding branch offices in Lübeck and Berlin. In 2019 the institute adopted its current name, Fraunhofer Institute for Digital Medicine MEVIS. By then the focus had expanded well beyond imaging to include the integration of diverse patient data for improved clinical decision-making.

Festive Ceremony, Symposium and Open House

The festive ceremony on September 3 at Bremen's town hall will feature discussions on "Digital Medicine – The Way Ahead" with policymakers, physicians, and long-time partners of the institute. As main part of the program Dr. Sibylle Anderl, chief editor of the department WISSEN at DIE ZEIT, will join Heinz-Otto Peitgen, Horst Hahn, and other important companions to highlight the institute's early years and to explore future challenges and opportunities. The ceremony will be opened by internationally acclaimed cellist Tanja Tetzlaff who realized the project Suites4Nature as part of her Glenn Gould Bach Fellowship, in which she impressively connects Bach's cello suites with nature and climate change.

On September 4 the institute will host the future-focused symposium "Impact of AI in Cancer Care and Beyond" on the University of Bremen campus. Experts from Germany and abroad, including Sweden, the Netherlands, and the United States, will discuss the future role of AI in oncology with a special focus on social and economic implications.
In the afternoon Fraunhofer MEVIS will open its doors to the public. During the Open

House visitors can explore interactive presentations of current projects and gain behind-the-scenes insights into ongoing AI research.

Fraunhofer MEVIS – International research and development in digital medicine from Bremen.

Embedded in a network of clinical and academic partners, **Fraunhofer MEVIS** develops practice-oriented software solutions for image- and data-based early detection, diagnosis and therapy. The focus is on cancer and diseases of the cardiovascular system, brain, breast, liver, lung and musculoskeletal system. The goal is to detect diseases earlier and more reliably, tailor treatments to the individual and make therapeutic success measurable. In addition, the institute develops software systems for industry partners as a means of analyzing image-based studies on the effectiveness of drugs and contrast agents. To achieve its goals, Fraunhofer MEVIS works closely with medical technology and pharmaceutical companies, providing solutions for the entire innovation chain from applied research to certified medical devices.

The **Fraunhofer-Gesellschaft**, headquartered in Germany, is one of the world's leading organizations for applied research. It plays a major role in innovation by prioritizing research on cutting-edge technologies and the transfer of results to industry to strengthen Germany's industrial base and for the benefit of society as a whole. Since its founding as a nonprofit organization in 1949, Fraunhofer has held a unique position in the German research and innovation ecosystem.
With nearly 32,000 employees across 75 institutes and independent research units in Germany, Fraunhofer operates with an annual budget of €3.6 billion, €3.1 billion of which is generated by contract research — Fraunhofer's core business model.