Fraunhofer MEVIS

PRESS RELEASE

Today's School for Tomorrow's Healthcare

In the 2025/26 school year, the new upper secondary specialization called "Digital Medicine" will launch in Bremen, developed by Fraunhofer MEVIS and the Oberschule am Waller Ring. On January 23 and 24, interested students can learn more about the new offering in the school auditorium at Lange Reihe 81 in Bremen.

Be it an algorithm for detecting tumors on a CT scan, an AI assistant for therapy planning, or a software system supporting monitoring the progress of treatment, digital tools are becoming increasingly vital in medicine. Some of these technologies are already being used, while others are still under development and will sooner or later find their way into clinical practice.

These new methods of digital medicine are considered groundbreaking for our healthcare system. Digitalization is set to fundamentally change existing occupational roles in medicine and create new ones. It is essential to spark young people's interest in this field, ideally starting at school. For this reason, the Fraunhofer Institute for Digital Medicine MEVIS, in collaboration with the upper secondary level of the integrated school at Waller Ring in Bremen, has developed a new offering: the upper secondary specialization called "Digital Medicine."

The school in Walle has long offered a health-focus. Starting in the 2025/26 school year, students will be able to choose this specialization for the first time. "With this new specialization, we want to inspire both students and teachers to engage with digital medicine and foster their scientific, mathematical, and technical skills," says Bianka Hofmann, head of science engagement at Fraunhofer MEVIS. The specialization targets students interested in healthcare professions and showcases perspectives that go beyond traditional medical studies. It highlights the importance of mathematics, physics, and computer science in integration with life sciences for future developments.

The specialization builds on a longstanding collaboration between the institute and the school through STEAM workshops—STEAM stands for Science, Technology, Engineering, Arts, and Mathematics. These workshops regularly provide opportunities for researchers, creatives, and school classes to explore topics in digital medicine from diverse perspectives. "These workshops served as an incubator and provided us with the space to try out new approaches," Hofmann explains.

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"The artistic and creative methods were an excellent way for MEVIS to make topics in digital medicine accessible and to spark interest among younger generations—even among those who wouldn't typically be drawn to STEM subjects."

Based on these positive experiences, the participants explored how to deepen and institutionalize these activities over the long term.

The result was the idea of offering digital medicine as a specialization, making it a key focus in the upper secondary academic curriculum. "The challenge for our school was to review the lesson plans and identify possible integration points," says Jan Wicke, head of the upper secondary school at Waller Ring. "How can we embed the content into the educational plans and curricula through an interdisciplinary approach?"

To address this, the teaching staff and the MEVIS team came together to develop an innovative concept. It consists of seven modules, all tied together by an overarching narrative depicting everyday medical practice. "This narrative tells the story of a patient who visits her doctor with symptoms," explains physician and MEVIS staff member Susanne Diekmann. "During the examination, a tumor with metastases is discovered and treated." Various digital tools are used in the process, helping to locate and measure tumors, select treatment strategies, and monitor therapy progress.

Even when initially identifying the causes of symptoms, digital tools are invaluable. Diverse information, measurements, and imaging data must be correlated. Algorithms capable of learning can assist in this process by analyzing databases to identify patterns and typical causes behind certain symptoms. "As researchers, we can help structure the data, identify patterns, and support possible diagnoses or rule them out," explains MEVIS mathematician Rieke Alpers. "This, in turn, supports the doctor's decision-making process, while the final diagnosis is ultimately made by the physician."

Each of the seven modules includes multiple levels of depth, starting with an entry-level tool that can be used without prior knowledge. "For example, there's a user interface where you can draw the contours of a tumor on an image using a mouse," explains MEVIS mathematician Anna Rörich. "You don't need expert knowledge for that; you just need to be able to operate a mouse."

Developing and testing such digital tools requires an interdisciplinary approach—bringing together medical professionals, physicists, computer scientists, and mathematicians. Accordingly, the "Digital Medicine" specialization is designed to be interdisciplinary. It combines subjects such as biology, mathematics, and computer science, as well as psychology. "For instance, you could explore the question of how receiving an unclear

diagnosis affects patients." says Jan Wicke. Even music has surprising connections to digital medicine, as demonstrated by a project in which students composed a piece of music inspired by data from a gene sequence analysis. To train upper secondary teachers appropriately, Fraunhofer MEVIS offers regular workshops under the motto "Teach the Teacher." The specialization not only influences students but also has a significant impact on teachers. It is a cross-disciplinary initiative that breaks down the traditional school subject boundaries.

Currently, a trial run of the specialization is underway at the Waller Ring upper secondary school. Starting in the next school year, the specialization will be available for selection for the first time. Ninth and tenth graders interested in this new focus can visit the Waller Ring school on **January 23 and 24, from 8:00 a.m.** until the end of classes, to attend and observe lessons in progress (**at Lange Reihe 81, Bremen, in the auditorium of the first upper floor**). After a brief introduction and an overview of the specialization, students will be distributed to different ongoing classes.

Using the web-based MEVIS tool called "Inside Insight," Jan Wicke will offer interactive introductory trial sessions introducing medical imaging and the new specialization. He will present the concept and provide examples of how digital medicine topics are integrated into various subjects. Students currently participating in the trial specialization will support him and share their experiences.

The specializations's primary goal is to motivate young people to critically explore the diverse aspects of digital medicine—and perhaps even inspire them to pursue studies in the field. "But the social aspect is also very important to us," emphasizes MEVIS mathematician Sabrina Tölken. "We want to promote diversity in digital medicine." Among other goals, the specialization aims to reach prospective first-generation university students—young people who would be the first in their families to pursue higher education.

The annually held "International Fraunhofer Talent School Bremen" supports this initiative by promoting the STEAM workshops. Additionally, the "#MOIN Campus-Nachbarschaft" ("Hello Campus Neighborhood") sub-project, funded by Germany's Federal Ministry of Education and Research (BMBF) and running until 2026, helps place an emphasis on mathematics in the specialization's modules.