

Fraunhofer MEVIS and Siemens Healthineers

PRESS RELEASE

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German Radiology Congress in Leipzig: Hall 2, Booth B 21

Information integration and artificial intelligence for better diagnosis and therapy decisions

Research alliance between Fraunhofer MEVIS and Siemens Healthineers develops decision support systems for physicians based on deep machine learning.

With their joint research alliance, Siemens Healthineers and the Fraunhofer Institute for Medical Image Computing MEVIS will support physicians in finding the right course of therapy for their patients. Both partners are jointly developing artificial intelligence software systems to facilitate diagnosis and therapy decisions with the help of advanced data integration, comprehensive databases, and automatic recognition of patterns and regularities in data (deep machine learning). The goal is to support physicians to define the best possible treatment approach for their patients fast and ensure that they receive the maximum benefit with minimum side effects. The cooperation contracts for the project, planned to run for four years, were signed recently. Through this collaboration, the partners want to strengthen the bond between their research activities. The aim is not only to develop intelligent decision support systems for clinically relevant problems, but also establish them on the market successfully. The partners will present their cooperation at a joint press conference at the German Radiology Congress in Leipzig (May 24 – 27, 2017).

All relevant information in one central system

Today, most of the information in clinics and medical practices is stored digitally. Until now image data, findings, lab values, digital patient records, and surgery reports are handled separately. However, there is a current trend aimed at gathering this information in one unified software framework. This data integration enables faster handling of medical information and lays the foundation for more efficient interaction between different specialties and to enable more precise and personalized clinical decisions. It also promises added value: New self-learning computer algorithms can detect hidden patterns in the data and give physicians valuable support for their diagnosis and therapy decisions.

Contact

Bianka Hofmann | Fraunhofer Institute for Medical Image Computing MEVIS | Phone +49 (0) 421 218 59231 | Bianka.Hofmann@mevis.fraunhofer.de | Am Fallturm 1 | 28359 Bremen | Deutschland |

Ulrich Kuenzel | Siemens Healthcare GmbH | Phone +49 (0) 9131 84 3473 | Ulrich.Kuenzel@siemens-healthineers.com | Henkestr. 127 | 91052 Erlangen | Deutschland |

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“When it comes to detecting relevant patterns and correlations in complex data volumes, computers are now better than humans,” says Horst Hahn, Director of Fraunhofer MEVIS. “This does not mean, however, that computers will make therapy decisions. They will simply support doctors with database-driven knowledge,” emphasizes Hahn. “The applications developed in collaboration with Fraunhofer MEVIS will support our customers to increase diagnostic quality and to make better decisions for their patients,” adds Walter Maerzendorfer, President Diagnostic Imaging at Siemens Healthineers. “Thanks to this research alliance and the merits of intelligent data integration we take the next step towards evidence based medicine.”

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Focus on tumor diseases

Based on comprehensive databases, the research partners will develop software systems that support clinicians in finding the best possible course of therapy. The work focuses on tumor diseases, such as lung cancer, for which physicians have to determine the necessity of a biopsy, a procedure known to be stressful for patients. The systems of Fraunhofer MEVIS and Siemens Healthineers would support physicians' decisions in the future. The goal is to let the software display all the information that could be relevant for decision-making. A physician would not have to gather information from separate sources, saving valuable time. Additionally, the guidelines of medical specialist societies will be integrated automatically, providing physicians with valuable support. Ultimately, the algorithms will link the case at hand with a comprehensive database. Which methods have provided the greatest benefit in similar cases? Does a nuclear medicine method such as PET/CT make more sense than a biopsy?

Most of all, the new system will help determine the best possible course of therapy. It will enable physicians with different specialties to access one central system to view all relevant information, including e.g. X-ray and MR images, tissue analyses, genetic parameters, lab values, and important data from the patient's medical history. Computer programs will search for patterns in comprehensive databases that could deliver helpful insight into the case at hand: Did surgery outperform radiation therapy in similar cases? Does an ongoing course of chemotherapy bring the anticipated success, or should it be ceased? The partners already have elementary access to necessary reference databases, but much will be developed and completed after the project commences.

A leader in medical technology, Siemens Healthineers is constantly innovating its portfolio of products and services in its core areas of diagnostic and therapeutic imaging and in laboratory diagnostics and molecular medicine. Together with its customer network, the company is able to develop new methods for computer-assisted medicine and transfer them to the market. Fraunhofer MEVIS brings important fundamental technology to the collaboration. The institute is excellently established in the international research community and cooperates closely with physicians from university clinics.

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The products/features (here mentioned) are not commercially available in all countries. Due to regulatory reasons their future availability cannot be guaranteed. Further details are available from the local Siemens organizations.

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Embedded in a worldwide network of clinical and academic partners, **Fraunhofer MEVIS** develops real-world software solutions for image-supported early detection, diagnosis, and therapy. A strong focus is placed on cancer as well as diseases of the circulatory system, brain, breast, liver, and lung. The goal is to detect diseases earlier and more reliably, tailor treatments to each individual, and make therapeutic success more measurable. In addition, the institute develops software systems for industrial partners to undertake image-based studies to determine the effectiveness of medicine and contrast agents. To reach its goals, Fraunhofer MEVIS works closely with medical technology and pharmaceutical companies, providing solutions for the entire chain of development from applied research to certified medical products. www.mevis.fraunhofer.de/en

The Fraunhofer-Gesellschaft is the leading organization for applied research in Europe. Its research activities are conducted by 69 institutes and research units at locations throughout Germany. The Fraunhofer-Gesellschaft employs a staff of 24,500, who work with an annual research budget totalling 2.1 billion euros. Of this sum, 1.9 billion euros is generated through contract research. More than 70 percent of the Fraunhofer-Gesellschaft's contract research revenue is derived from contracts with industry and from publicly financed research projects. International collaborations with excellent research partners and innovative companies around the world ensure direct access to regions of the greatest importance to present and future scientific progress and economic development. www.fraunhofer.de/en

Siemens Healthineers is the separately managed healthcare business of Siemens AG enabling healthcare providers worldwide to meet their current challenges and to excel in their respective environments. A leader in medical technology, Siemens Healthineers is constantly innovating its portfolio of products and services in its core areas of diagnostic and therapeutic imaging and in laboratory diagnostics and molecular medicine. Siemens Healthineers is also actively developing its digital health services and enterprise services. To help customers succeed in today's dynamic healthcare marketplace, Siemens Healthineers is championing new business models that maximize opportunity and minimize risk for healthcare providers. In fiscal 2016, which ended on September 30, 2016, Siemens Healthineers generated revenue of €13.5 billion and profit of over €2.3 billion and has about 46,000 employees worldwide. Further information is available at www.siemens.com/healthineers.