Fraunhofer IGD

FRAUNHOFER-INSTITUT FÜR GRAPHISCHE DATENVERARBEITUNG IGD

PRESSEINFORMATION

Artificial Intelligence for Optimal Patient Care

Artificial intelligence is defining medicine and opening up new possibilities for everyone involved on the path to individual health. At the MEDICA trade fair, from November 12 to 15, 2018 in Düsseldorf, Germany, researchers from Fraunhofer IGD will present new technology for virtual biopsies and cohort analysis that utilize artificial intelligence.

(Darmstadt/Düsseldorf) When a person is taken to the hospital—with a tumor in the head and neck region, for example—the first step is a comprehensive diagnosis: The shape and location of body structures such as organs, tissue and tumors need to be identified and highlighted in medical imaging data. However, with three-dimensional imaging, such as MRI or CT, doing this manually is extremely laborious and time-consuming. Special software developed by the Fraunhofer Institute for Computer Graphics Research will soon assist health professionals not just in this type of analysis of imaging data, but it will also automatically generate a "virtual biopsy", localizing and highlighting the tumor, displaying it three-dimensionally and analyzing the data. This will allow the software to derive over a hundred parameters from the CT images of a head and neck tumor. Initial results show that this approach not only analyzes CT images more quickly, it also provides information that could only be obtained through a surgical procedure and subsequent lab testing of the biopsied tissue. Aside from imaging organs and body regions, artificial intelligence is making it possible to automatically segment and analyze imaging data that is difficult to interpret.

Diagnosis and treatment in the "Smart Hospital"

Another interesting question doctors face is whether there are noticeable connections between the person being treated and other people. To answer this, health professionals combine the data of people with similar clinical pictures or other similarities, such as age or gender, into cohorts. The researchers at Fraunhofer IGD have developed software to assist doctors in forming suitable cohorts, examines them for significant connections, visualizes the attributes, and facilitates and accelerates the identification of clinically relevant hypotheses. What took several hours to do manually will take this automatic process mere seconds—valuable time gained for treating the patient. Incorporating artificial intelligence in the search for a hypothesis also ensures that a potentially critical factor is not overlooked.

Daniela Welling | Leiterin Unternehmenskommunikation
Fraunhofer-Institut für Graphische Datenverarbeitung IGD
Fraunhoferstraße 5 | 64283 Darmstadt
Telefon +49 6151 155-146 | presse@igd.fraunhofer.de | www.igd.fraunhofer.de

More time for patients with a visual control station
Created by compiling all relevant parameters, the patient's »digital twin« contributes to optimal care. Health@Hand, Fraunhofer IGD's visual solution, combines all digitally available data, including the patient's real-time vitals, into a graphic overview. As a digital control station, the system provides hospital staff with all relevant information with just a click and reprocesses it visually. This means necessary information is collected considerably more quickly. However, the control station is not content with just showing a single patient, rather it shows a live 3D model of the entire hospital ward, including inventory. Doctors and nurses can view the digital twin of the station on a PC or tablet and immediately know where, for example, a mobile X-ray machine is currently located. Key data for the entire ward can either be displayed all at once or viewed in detail—for a single room or over a given period, for example. The goal is to simplify ward monitoring, detect disturbances immediately and thus be able to intervene in time.

Preventive and follow-up care in the age of digital health
To analyze an individual's health information, the Health@Hand system links together crucial data from different clinical data systems to make possible entirely new conclusions. Trends in the patient's health can be identified sooner and prognoses for the treatment process made more quickly. To maintain a patient's health even at home, continuously recorded vitals can be supplied directly to the system. This would be sensible for, say, diabetes: The doctor immediately sees when levels exceed normal range and can take appropriate action. Even vitals and activity data from wearables, such as fitness armbands or smartwatches, can be included in the system, allowing it to act as a personal health assistant and make a valuable contribution to prevention.

Fraunhofer IGD at MEDICA
Düsseldorf, November 12–15, 2018
Hall 10, Stand G05
At noon on Wednesday, November 14, 2018, Matthias Noll will be at the Medica Connected Healthcare Forum in Hall 15, Stand C24 to give a talk on »Augmented Reality in the OR«.

More information:

www.igd.fraunhofer.de/veranstaltungen/medica-2018

Daniela Welling | Leiterin Unternehmenskommunikation
Fraunhofer-Institut für Graphische Datenverarbeitung IGD
Fraunhoferstraße 5 | 64283 Darmstadt
Telefon +49 6151 155-146 | presse@igd.fraunhofer.de | www.igd.fraunhofer.de

PRESSEINFORMATION

www.igd.fraunhofer.de/institut/mission-vision/vision/individuelle-gesundheit

Image (M): Fraunhofer IGD's visual solution combines all digitally available data into a graphic overview. (© Fraunhofer IGD - everythingpossible/Fotolia)

Daniela Welling | Leiterin Unternehmenskommunikation
Fraunhofer-Institut für Graphische Datenverarbeitung IGD
Fraunhoferstraße 5 | 64283 Darmstadt
Telefon +49 6151 155-146 | presse@igd.fraunhofer.de | www.igd.fraunhofer.de

PRESSEINFORMATION

Institute Profile

Founded 30 years ago, Fraunhofer IGD is the world's leading institute for applied research in visual computing—the ability to convert information into images (computer graphics) and obtain information from those images (computer vision). The potential applications are diverse and are used in areas such as man–machine interaction, interactive simulation and modeling.

Our researchers at our Darmstadt, Rostock, Graz and Singapore sites develop new technical solutions and prototypes down to start of production. In collaboration with our partners, this results in application solutions tailored specifically to the customer.

Our approaches make it easier to work with computers and are efficiently applied in industry, everyday life and healthcare. Our research focuses on supporting humans in Industry 4.0, developing key technologies for smart cities and using digital solutions for personalized medicine.

Through applied research, we assist in the strategic development of industry and the economy. This benefits SMEs and service centers in particular, and our cutting-edge technology can help them achieve success on the market.

Daniela Welling | Leiterin Unternehmenskommunikation
Fraunhofer-Institut für Graphische Datenverarbeitung IGD
Fraunhoferstraße 5 | 64283 Darmstadt
Telefon +49 6151 155-146 | presse@igd.fraunhofer.de | www.igd.fraunhofer.de