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Press release

Technische Universität Kaiserslautern
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11/02/2021
http://idw-online.de/en/news778541

Research projects, Transfer of Science or Research
Information technology, Medicine, Sport science
transregional, national

Medica 2021: Artificial intelligence method will provide personalised diagnosis of back problems

Back problems are generally regarded as a widespread disease with many sufferers struggling with pain. A team of researchers from TU Kaiserslautern (TUK), the University Medical Centre in Mainz and several companies is working on a method that will enable more efficient monitoring of malpositions and strains on the back. Artificial intelligence (AI) methods are also being used to help analyse the spine individually. The researchers will be presenting their project at the Medica medical technology trade fair held from 15 to 18 November at the Rhineland-Palatinate research stand (hall 3, stand E80).

Whether at work or in private life, sitting too much at the computer, too little movement, is a common phenomenon, especially in corona times. The consequence that follows: Many people have back problems. Yet there are many proven preventive measures, such as courses in back exercises or relaxation methods, which are usually also offered and reimbursed by health insurance companies.

“But all this is of little use if the cause of the pain is not clearly defined,” says Carlo Dindorf, a scientist in the Department of Sports Science at TU Kaiserslautern. This is precisely what the TUK team is working on together with Jürgen Konradi and the research team of the Interprofessional Study Centre of Motion Research at the University Medical Center of the Johannes Gutenberg University in Mainz, the medical technology company DIERS International GmbH and other project partners.

The interdisciplinary team is relying on a diagnostic technique that is already well-tested and widespread in practice. “We scan the back with a projector and a camera unit,” says Dindorf. This involves projecting a grid of light onto the back. Using so-called raster stereography, an individual model of the spine can thus be generated. A new aspect of the method is the use of AI and machine learning methods. “Our system learns with the help of the data obtained,” explains Dindorf. “The more spines are analysed, the better the system and thus our understanding of the spine improves.”

This knowledge can help medicine in the future, for example, to better detect malpositions and to provide personalised diagnoses that enable individualised therapy. But the technology is also of interest for professional and amateur sports as well as for basic research in general. The result is a much more differentiated picture and better insight into the function of the spine.

Offene Digitalisierungsallianz Pfalz (Open Digitalisation Alliance Palatinate) is also involved in the project. “Together with Offene Digitalisierungsallianz Pfalz, we are working on transferring our findings into practice in collaboration with other researchers, with stakeholders from the health sector and with companies in the region,” says Professor Dr Michael Fröhlich, spokesperson for the Health Innovation Area and head of the Department of Sports Science with a focus on exercise and training science at TUK. “We are getting closer step by step to realising the goal of a more precise, individually targeted medicine that can make its contribution to back health,” Fröhlich continues.

The project team will present its work at Medica.

Offene Digitalisierungsallianz Pfalz
Offene Digitalisierungsallianz Pfalz is a joint project of Kaiserslautern University of Applied Sciences, Technische Universität Kaiserslautern and the Fraunhofer Institute for Industrial Mathematics (ITWM). The project enhances the transfer of ideas, knowledge and technology with industry and society and is based on a cooperation strategy of the two universities. Offene Digitalisierungsallianz Pfalz is funded by the Federal Ministry of Education and Research within the framework of the federal-state initiative "Innovative Hochschule".

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Klaus Dosch, Department of Technology and Innovation, is organizing the presentation of the researchers of the TU Kaiserslautern at the Medica. He is the contact partner for companies and, among other things, establishes contacts to science.
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The new procedure is intended to detect the causes of back problems more efficiently. Credit: Interprofessionelles Studienzentrum für Bewegungsforschung (SZB)
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