

New at UDE: Jianxu Chen Biomedical Image Analysis with AI

High-performance microscopes provide high-resolution insights into tissues and cells. Artificial intelligence helps to analyse the vast amounts of complex image data. Dr Jianxu Chen, newly appointed Professor of AI for Biomedical Analytics at the Faculty of Medicine at the University of Duisburg-Essen (UDE), is conducting research in this field at the Leibniz-Institut für Analytische Wissenschaften – ISAS – e. V. With this appointment, UDE and ISAS are continuing their successful collaboration; the professorship is awarded according to the Jülich model.

“Machine learning algorithms can analyse thousands of microscope images within a matter of minutes and identify information that remains hidden from the human eye and brain,” explains Prof. Dr Jianxu Chen. The challenge lies in comprehensively analysing the enormous volumes of complex image data. These are often three-dimensional, captured across multiple image channels and sometimes generated over extended periods of time. “The key is being able to identify relevant patterns, changes, or correlations within them – such as minimal differences between healthy and diseased cells.”

This is where Chen’s research comes in. Together with his team, the computer scientist develops tailor-made AI software – always based on specific biomedical questions. To this end, Chen collaborates closely with research groups at Essen University Hospital, the UDE, and ISAS. The 37-year-old sees his research as a bridge between biomedicine and computer vision: “In practice, we achieve the best results when we can incorporate AI methods even before the imaging is planned.” This would allow for extracting the maximum amount of information from the data.

Chen studied mathematics (2007-2011) at the University of Science and Technology of China. In 2017, he earned his Ph.D. in Computer Science and Engineering from the University of Notre Dame (USA). For four years, he conducted research at the Allen Institute for Cell Science in Seattle, where he led the research and development unit focused on machine learning in the analysis of cell images. In 2021, Chen moved to Dortmund to join ISAS and take over as the Head of the AMBIOM – Analysis of Microscopic BIOMedical Images junior research group. He has received several national and international grants for his research, including various awards from the German Research Foundation (Deutsche Forschungsgemeinschaft), the Federal Ministry of Research, Technology and Space (Bundesministerium für Forschung, Technologie und Raumfahrt) and the Chan Zuckerberg Initiative (USA).

About ISAS

The Leibniz-Institut für Analytische Wissenschaften – ISAS – e.V. develops powerful analytical methods for health research. Through its innovations, it contributes to improving the prevention, early diagnosis, and treatment of conditions such as cardiovascular diseases, autoimmune diseases, and cancer. The goal is to advance personalised therapy. To this end, ISAS combines knowledge from biology, chemistry, medicine, pharmacology, physics, and computer science. The institute works closely with universities in Germany and abroad, for example through joint appointments.

Note to editors:

A photo of Prof. Dr Jianxu Chen (photo credit: ISAS) for reporting on his appointment is available at the following link: <https://www.isas.de/en/press/archive/professur-chen>.

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