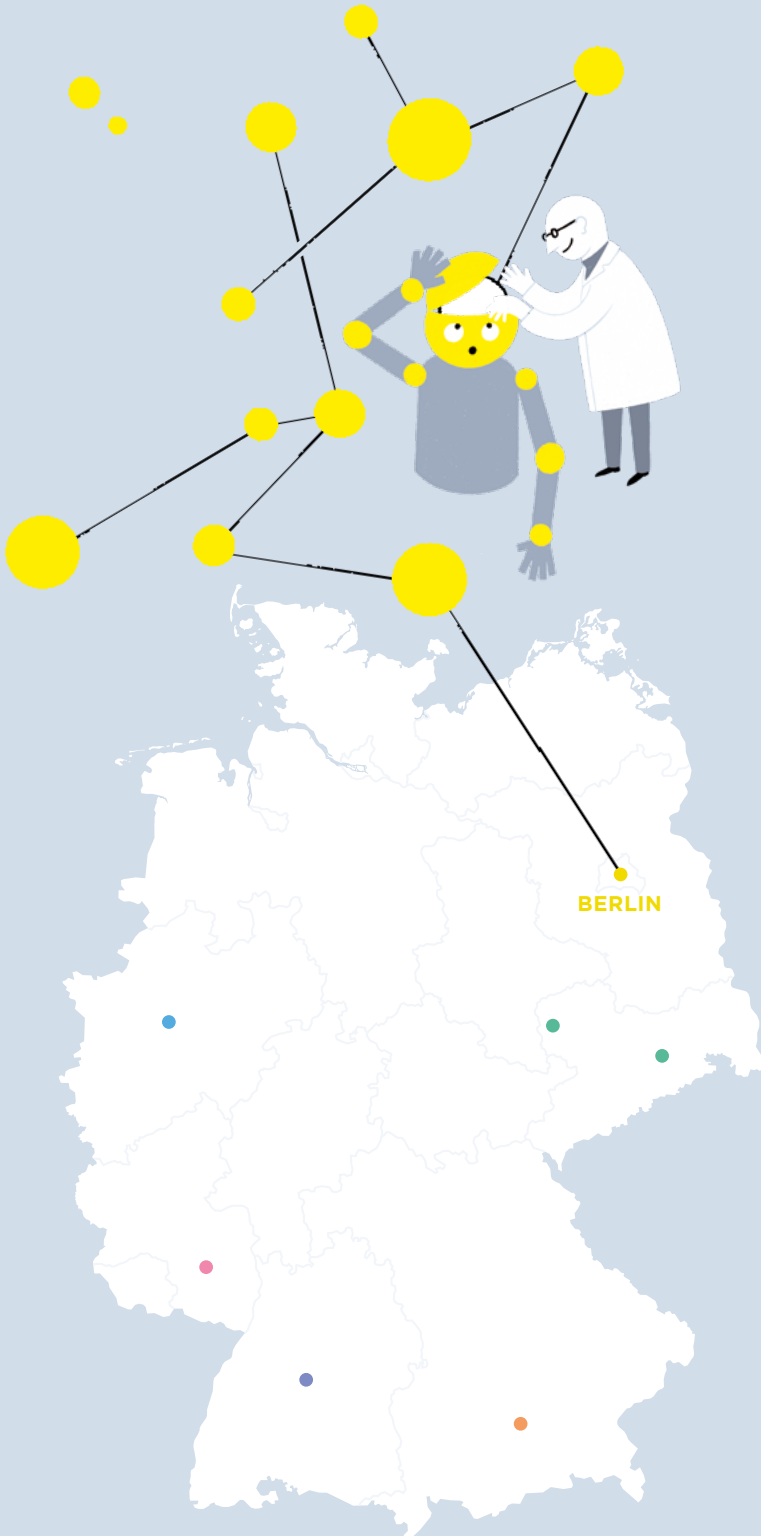


# SELECTED AI-HOTSPOTS IN GERMANY: AN OVERVIEW



## BERLIN

### HOTSPOT OF AI RESEARCH



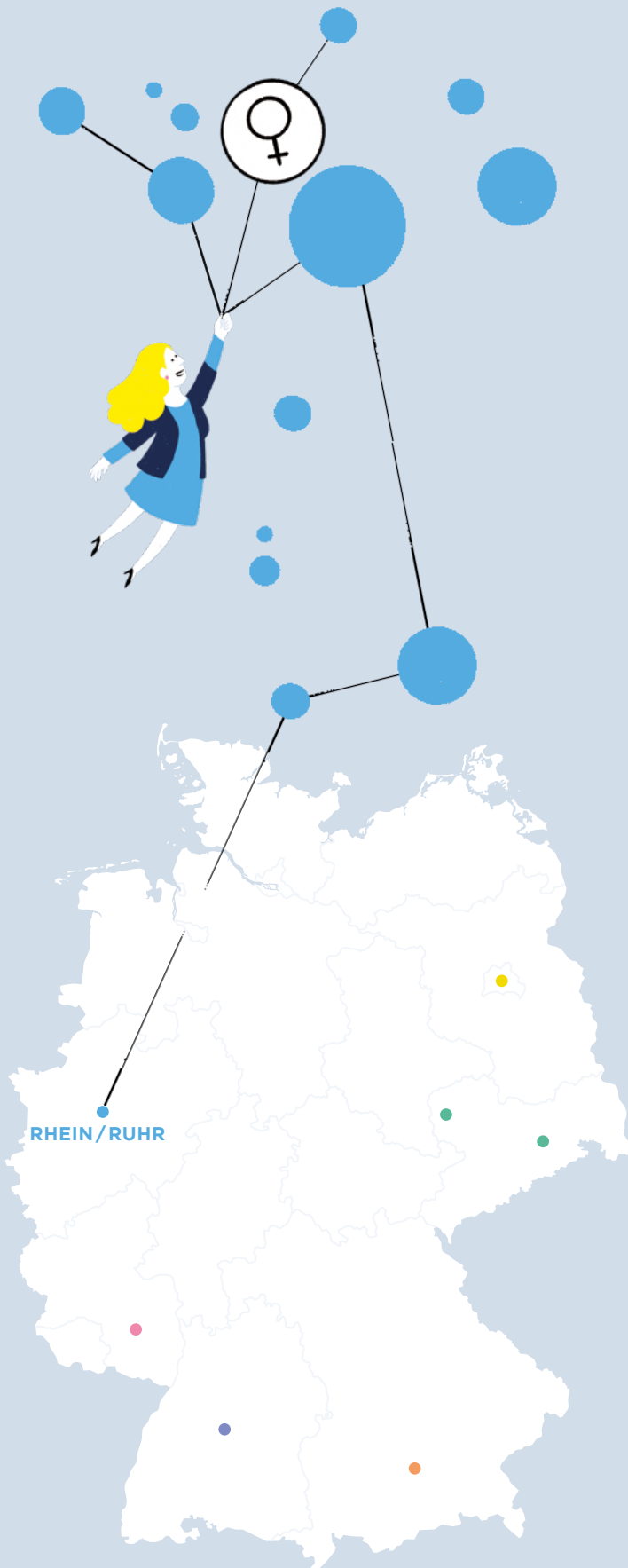
The Berlin region is an AI hotspot. According to a study conducted by the Technologiestiftung Berlin, some 60 professors currently conduct research on various aspects of artificial intelligence at universities and non-university research institutions. One of the region's academic highlights is the "Science of Intelligence" cluster of excellence. "We come from different disciplines and want to understand what intelligence is," says **Oliver Brock**, professor of robotics at TU Berlin and spokesman for the cluster. The special thing about it is that the insights gained are immediately implemented, for example in extremely versatile robotic hands based on the human model. "Robots are embodied intelligence and thus a core element of AI," says Brock. Now, many national and international AI companies have also established themselves in the region, including market giants like Google. And fifty percent of German AI start-ups have settled here, according to the Platform #AI-Berlin.

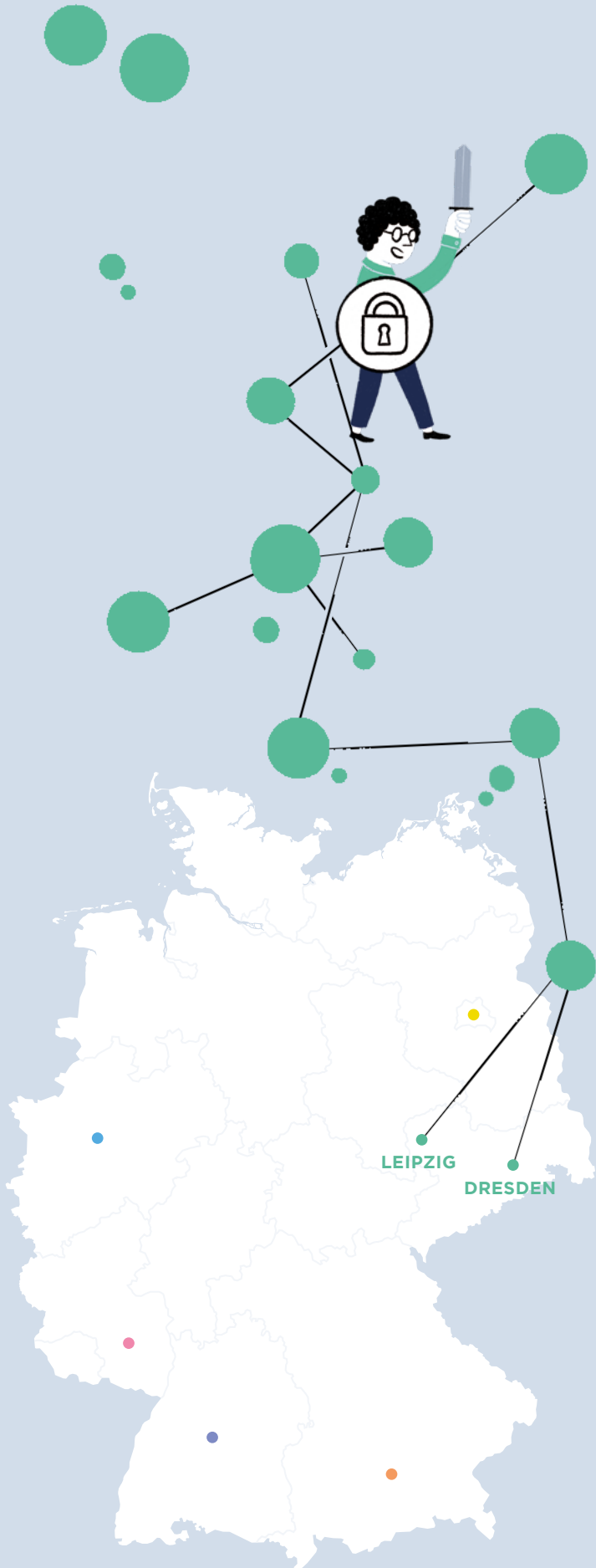
RHEIN/RUHR

DORTMUND COORDINATES AI CENTRES



In Dortmund, many of the threads of the German AI scene are woven together. It is from here that the computer scientist, **Katharina Morik**, coordinates the six centres of excellence in artificial intelligence and organises AI cooperation with France. In Dortmund itself, the TU professor is in charge of the Competence Center Machine Learning Rhine-Ruhr that is operated by the universities of Dortmund and Bonn together with two Fraunhofer institutes (the Fraunhofer Institute for Intelligent Analysis and Information Systems IAIS, St Augustin, and the Fraunhofer Institute for Material Flow and Logistics IML, Dortmund). In addition to basic research and transfer activities, the pioneer of machine learning feels very strongly about promoting young scientists. She believes, for example, that young women have enormous potential. “At present, only about 20 percent of AI specialists are female, which is a real shame.” It is an ideal research area, she notes, for women who are passionate about a better future for humans and nature. Katharina Morik’s vision of the future of AI in Germany is permanently funded, strong centres of excellence radiating out and actively pursuing exchange, especially within Europe and with Australia: “There they prefer our third path for dealing with artificial intelligence.”





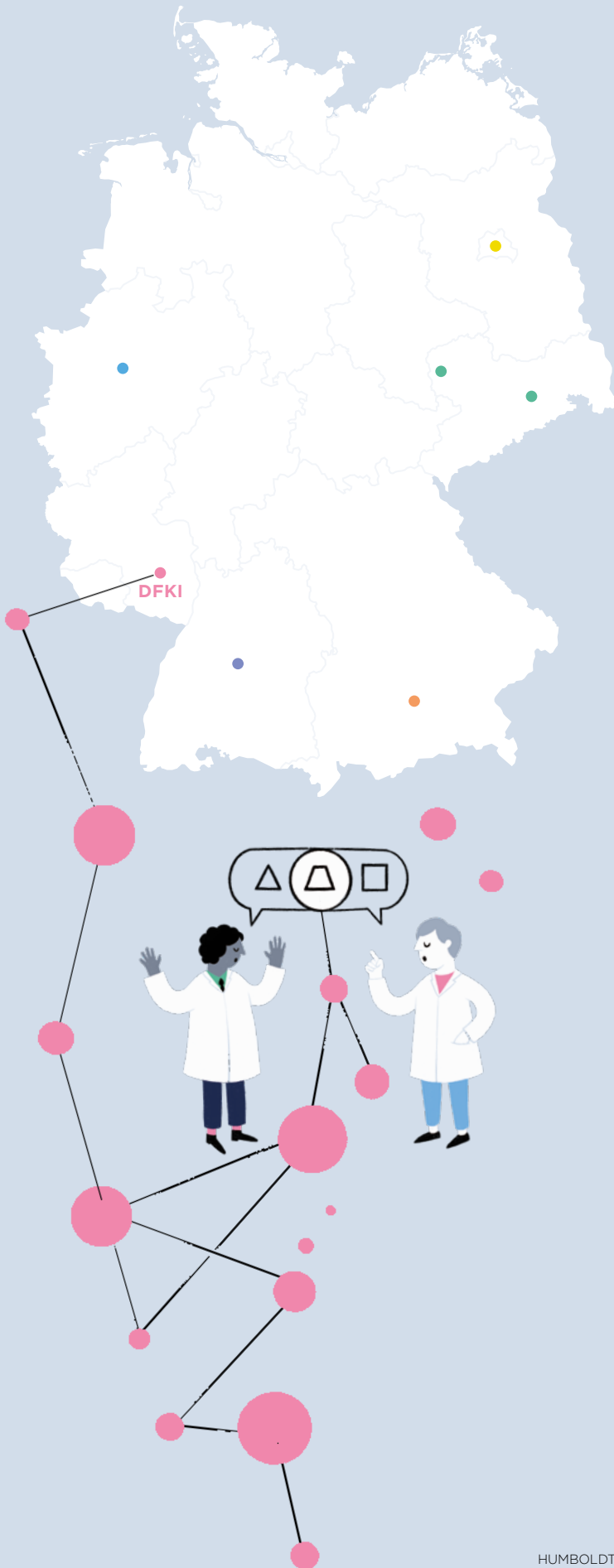
## DRESDEN/LEIPZIG

# AI TO COMBAT HACKERS



“The euphoria about AI in this part of the country is impressive,” says **Erhard**

**Rahm**, professor of computer science at the University of Leipzig. Together with colleagues, he founded the Center for Scalable Analytics and Artificial Intelligence (ScaDS.AI Dresden/Leipzig) which focusses on developing machine learning methods for handling Big Data as well as trustworthy AI methods for the fair and protected use of sensitive data. From the very beginning they always consider practical applications, Erhard Rahm explains, looking at improving tumour diagnosis, for instance, or defence against cyber-attacks. A new graduate school with sites in Leipzig and Dresden shall train the young experts, who are so desperately needed both inside and outside academia, as well as building a bridge to business with an AI service centre. “The German AI centres of excellence are the seeds that urgently needed to be sown,” says Erhard Rahm and adds, “What we now need is permanent funding and new AI professorships so that great things may grow.”



## DFKI, GERMAN RESEARCH CENTER FOR ARTIFICIAL INTELLIGENCE

### APPLICATIONS FOR INDUSTRY AND SMES



The German Research Center for Artificial Intelligence, founded as a public/private body in Kaiserslautern and Saarbrücken in 1988, brings together large corporations from all over the world, medium-sized enterprises and research institutions. The centre now employs more than a thousand staff who work at five different sites to develop AI solutions for various sectors – from the automotive industry via agriculture and shipping through to trade. “Many innovations have their origins here, such as the principles for the first versions of the globally used translation programme, Google Translate,” says

**Wolfgang Wahlster**, professor of computer science and founding director of DFKI. According to Wahlster, AI research in Germany has a 70-year tradition and is still two or three years ahead of other countries when it comes to applications in manufacturing industries. Wahlster: “If that’s what you’re interested in – the keyword here is Industry 4.0 – Germany is the place to be.”

TÜBINGEN

IN SWABIA'S CYBER VALLEY

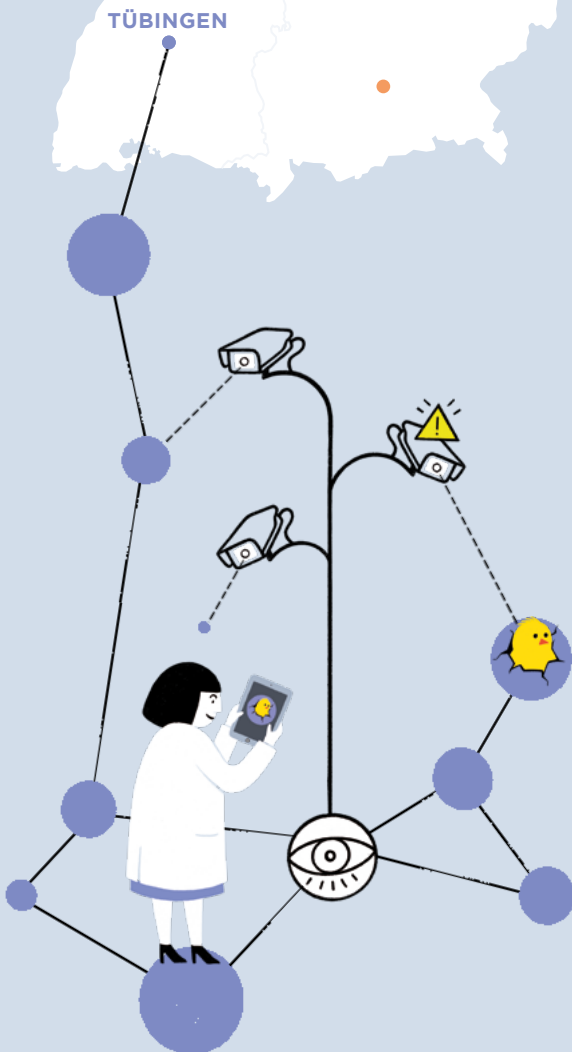
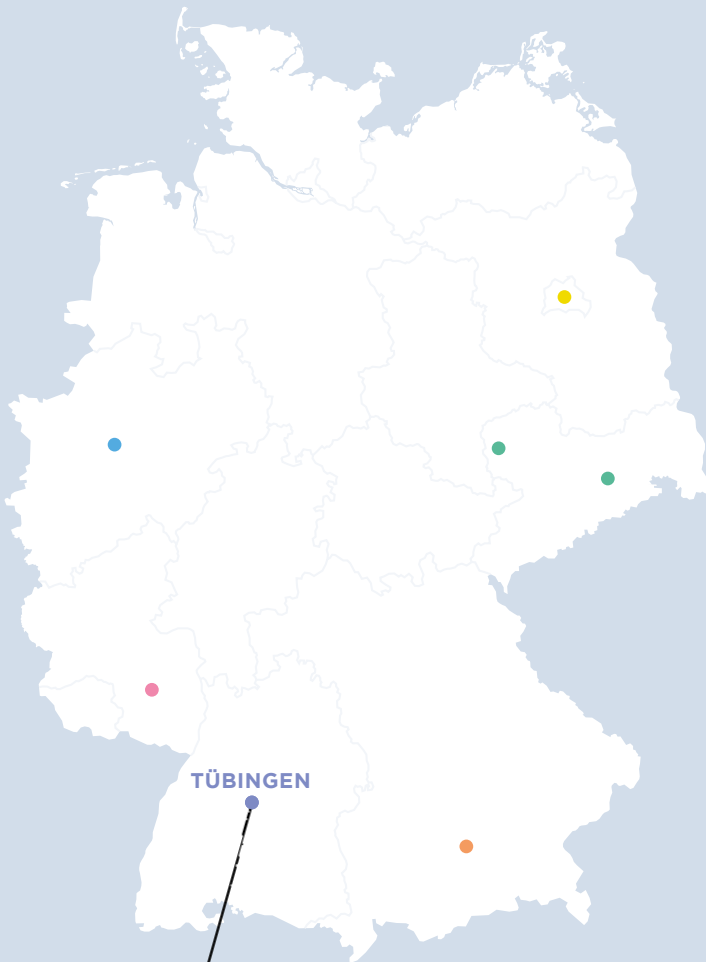


In Cyber Valley, between Stuttgart and Tübingen, a major AI research alliance is emerging, combining academia and business. The neuroscience fields, which want to link the new Tübingen AI Center with AI research, are one of the main drivers. "It's a pulsating research environment," says

**Peter Dayan**, who became the first Humboldt Professor for Artificial Intelligence at the University of Tübingen and director of the Max Planck Institute for Biological Cybernetics at the beginning of 2020. A theoretical neuroscientist, he investigates how people manage to make good decisions in an uncertain world and how these processes can be transferred to artificial systems.



**Jessica Heesen**, philosopher at the International Center for Ethics in the Sciences and Humanities (IZEW) at the University of Tübingen, would like ethical reflection to be an integral part of AI projects like this from the word go. The head of the Tübingen Research Focus "Media Ethics and Information Technology" argues for value-based AI development that monitors the origin of data, communicates the goals of algorithms and focusses on the societal significance of its applications. "Integrated research can make this work well, but only if technology and ethics cooperate on a level playing field."



MUNICH

# MACHINE LEARNING: TURNING AI INTO A HELPER



Machines that find good solutions of their own accord – this is the common objective of researchers at the AI centre of excellence, Munich Center for Machine Learning (MCML). They all have backgrounds in data science, computer science and statistics and want to propel the practical application of AI, as well as further basic research. Like **Daniel Rückert**. At Imperial College London, the German computer scientist developed algorithms that can crucially improve medical imaging. Using his calculation rules, tumours and other anomalies in body tissue can be discovered more easily and correlated with a clinical picture, for example. “AI enables us to visualise things that the human eye can’t detect,” says Daniel Rückert who has been awarded a Humboldt Professorship for Artificial Intelligence and moving to Technical University of Munich. The fact that Munich is an up-and-coming hotspot for AI is a strong argument in favour of the location, according to Rückert, whose eyes light up at the future prospect of using data from imaging examinations, lab tests and genetic analyses to draw up a complete image of a patient.

