

WHEN THE HUMAN MIND REACHES ITS LIMITS

2020

PROF. DR.

THOMAS BERGER

The agricultural scientist wants to bring together collective and artificial intelligence in such a way that complex relationships can be better predicted.



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To preserve the diversity of plants and animals, you have to think beyond the boundaries of individual fields, says Thomas Berger. As the problem is becoming increasingly complex, he is trying to use distributed artificial intelligence to better predict the diverse interactions.

The world is complicated. Solving one problem sometimes creates a new one, as the interrelationships are complex - often too complex to fully understand and set a sensible course to steer. For example, there are various environmental programs to promote biodiversity in arable farming. Farmers receive subsidies if they set up flower strips and leave land fallow. However, insects are not deterred by field boundaries; they also fly into neighboring fields. Biodiversity can therefore only be promoted effectively if one thinks bigger and creates habitats for plants and animals at the landscape level. This is exactly what Thomas Berger wants to make possible. He is trying to find ways in which people can work together better and more effectively in an increasingly complex world. "We can no longer solve the big problems because we don't understand them," he says, "which is why we need artificial intelligence as well as collective human intelligence."

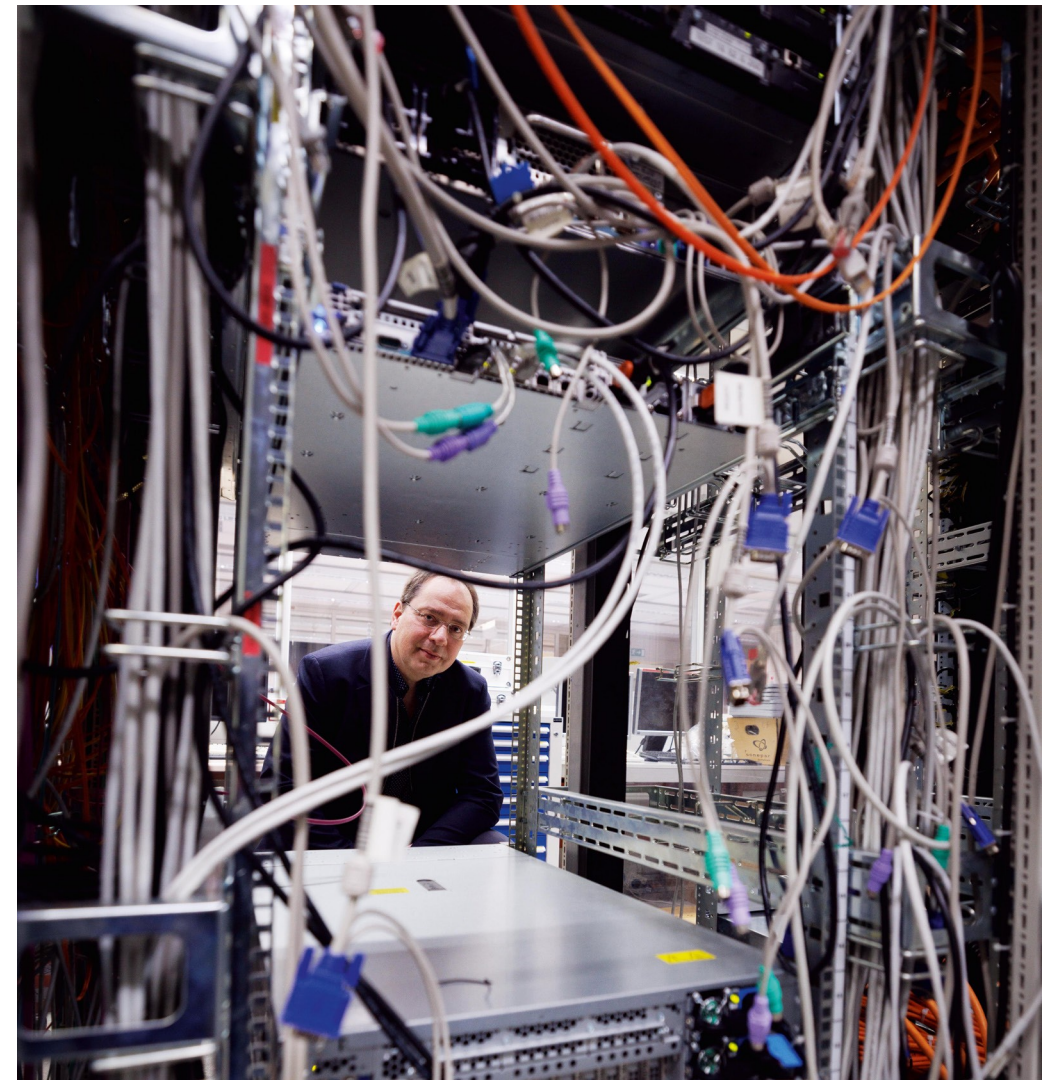
The agricultural scientist has been working with computer simulation models and supercomputers for many years. His vision is to bring together collective human and artificial intelligence in such a way that interactions can be better predicted despite complex interrelationships. Thomas Berger is using the funding from the Gips Schüle Foundation to prepare an application for a collaborative research center of the 'Deutsche Forschungsgemeinschaft'. Using biodiversity as an example, interdependent data and processes are to be captured on a digital platform and evaluated using artificial intelligence.

Thomas Berger believes that this will also enable collaboration and coordination in agriculture, ecology and politics. "Spatial interactions are still ignored in current thinking and policy." The digital platform he envisions could also provide valuable assistance in other areas in the future, such as regional recycling and waste management. Thomas Berger is convinced: "The problem solver of the future is when collective human and artificial intelligence come together."

Prof. Dr. Thomas Berger: Further development of the university's focus on bioeconomy and digital transformation



How can people coordinate better their land use? Thomas Berger designs scenarios for land use. He uses supercomputers to investigate their effects. But sometimes it also helps to visualize complex processes as clearly as possible.



Thomas Berger works with supercomputers to model the complex issues of the future.

PROFESSIONAL SIMULATOR: THOMAS BERGER

Thomas Berger may not come from the countryside, but he is a trained farmer. He studied agricultural sciences in Göttingen and, after completing his doctorate in Bonn, worked at the Center for Development Research (ZEF) leading a junior research group. He came to Hohenheim in 2004, initially as a visiting professor, and then became Professor of Land Use Economics in 2007.

Thomas Berger's research focuses on computer simulation models, which he already used in his diploma thesis to make complex issues more transparent. A milestone in his career was an interdisciplinary research project at the CGIAR International Agricultural Research Centers, in which a complex model system was developed to improve water use in Chile and Ghana. "We're doing science outside the ivory tower," says Thomas Berger. Together with his colleagues, he fuses comprehensive data that are scattered across many sources so that the interactions between the various agricultural activities can be calculated using computer simulations - and the effects on the environment can be better predicted.

GIGANTIC COMPUTING POWER

Today, the computing power in Thomas Berger's simulation experiments is

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higher than in his doctoral thesis.