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# STRUCTURES JOUR FIXE

**HELMUT LINDE**

Merck KGaA (Darmstadt, Germany)

“The future of Artificial Intelligence”

**13 December 2019 11:30 AM**

Room 106, Philosophenweg 12  
Contact: [office@structures.uni-heidelberg.de](mailto:office@structures.uni-heidelberg.de)



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## ABSTRACT

How will the next generation of Artificial Intelligence (AI) look like? Comparing today's AI algorithms with biological intelligence, one of the most remarkable differences is the ability of the human brain to somehow understand the 'essence' of things: Even a small child can easily recognize a cat after having seen only a few examples. We recognize a song even if played on different instruments or in a different key. And we recognize a story independent of whether we see it as a movie, hear it as an audio play or read it in a book.

In other words: Brains are able to create invariant representations of real-world entities - and today's algorithms are not.

I will argue that invariant representations are the key to general AI and that the brain can serve as an inspiration for the next generation of machine learning algorithms. Even though today there is very limited understanding of how the brain works conceptually, i.e. what algorithm it implements, I'll explain why there is hope that we can reverse-engineer the brain and that we can implement its most important algorithmic components in a computer. I'll explain why a highly interdisciplinary approach is needed from neuroscience, computer science, mathematics and physics to make progress in this important question.

## SPEAKER

Helmut Linde is the Global Head of Data Science & Analytics at Merck KGaA (Darmstadt, Germany). He is responsible to drive innovation in the field of advanced analytics and artificial intelligence and to ensure that the company leverages the potential of these modern technologies. He leads an organization of expert data scientists and analysts who support all Merck businesses in advanced analytics projects. Before joining Merck, Helmut has held various leadership roles at the software company SAP in the area of data science, overseeing the development and implementation of customer-specific forecasting and optimization solutions. Helmut has an academic research background in mathematical physics.

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