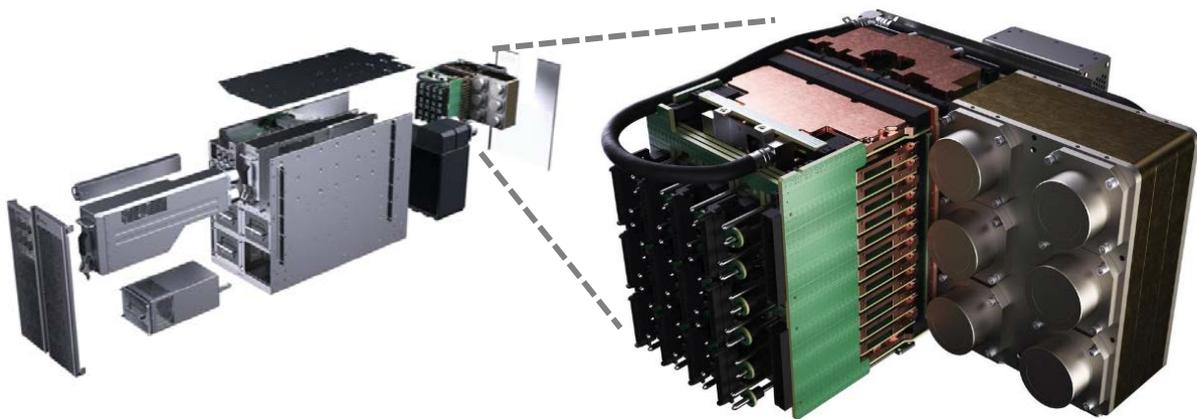


## Einladung zum 238. Institutskolloquium

Thema: **The Battle for Machine Learning Hardware**  
Vortragender: **Dr. Ir. Patrick Groeneveld, Cerebras Systems Inc., Los Altos, CA, USA**  
Leitung: **Prof. Dr.-Ing. habil. Jens Lienig**  
Zeit / Ort: **23. April 2021, 14 Uhr**  
**<https://global.gotomeeting.com/join/319779157>**

The extreme compute requirements of Machine Learning (ML) drives an entirely new generation of hardware. The very compute-intensive ML training is generally done in data centers using re-purposed GPUs. This provides cost-efficient floating-point compute hardware that interfaces with the well-known TensorFlow ML platform. To run on a GPU, however, the training data and weights needs to be segmented to fit the limited on-chip memory and bandwidth. Cerebras takes a radically different approach with a massive 22 x 22 cm monolithic chip that contains over 400,000 powerful compute cores with 1.2 Trillion (with a T) transistors. This massive Wafer Scale Engine (WSE) allows the entire ML model, including all weights, to remain stationary in hardware while only the training data is streamed in at very high speed. The result is a dramatic speedup of the training process.

In this 45-minutes presentation we will address how the ML kernels are synthesized, placed and routed on the WSE compute fabric. In more detail we will discuss the unique interconnect properties of the compute fabric, and the EDA-inspired solutions to efficiently map the compute kernels.



### About Patrick Groeneveld, PhD

Patrick currently works at Cerebras Systems, a machine learning hardware startup that makes the world's first monolithic supercomputer. Before that he worked for many years in the EDA industry. He was Chief Technologist at Magma Design Automation where he was part of the team that developed a groundbreaking RTL-to-GDS2 synthesis product. Patrick was as also a Full Professor of Electrical Engineering at Eindhoven University. He is a lecturer in the EE department at Stanford University and serves as finance chair in the Executive Committee of the Design Automation Conference. Patrick received his MSc and PhD degrees from Delft University of Technology in the Netherlands.