



# PPCES: Machine and Deep Learning

Focus and Agenda



DAS KOMPETENZNETZWERK FÜR HOCHLEISTUNGSRECHNEN.

- **Content that is not covered in this workshop!**
  - In-depth mathematical background of Machine Learning (ML) and Deep Learning (DL)
  - Advanced features and fine tuning of frameworks (see further links)
  - Unfortunately no time to cover all types such as Reinforcement Learning, LLM, ...
- **Content covered in this workshop!**
  - **General introduction into ML / DL**
    - Supervised vs unsupervised learning
    - Techniques: classification / regression / clustering / pre-processing
    - What is the appropriate choice for my task?
  - **Operation and execution (on CLAIX)**
    - Overview of available hardware and software for ML / DL
    - How to run regular or distributed workloads using frameworks such as scikit-learn and PyTorch?
    - Identifying resource utilization on CLAIX
  - **Hands-on exercises (Labs)**

Zeit	Thema	Berichtende/r
09:00 – 10:30	Introduction to AI, Machine and Preprocessing Techniques – Part 1	Jannis Klinkenberg (RWTH)
10:30 – 11:00	Break	
11:00 – 12:30	Introduction to AI, Machine and Preprocessing Techniques – Part 2 Execution Options for ML / DL Software Lab: Machine Learning with scikit-learn	Jannis Klinkenberg (RWTH)
12:30 – 14:00	Lunch Break	
14:00 – 14:45	Introduction to Deep Learning + Example	Jannis Klinkenberg (RWTH)
14:45 – 15:30	Introduction to Distributed Deep Learning + Example	Jannis Klinkenberg (RWTH)
15:30 – 16:00	Break	
16:00 – 17:00	Lab: Deep Learning with PyTorch	Jannis Klinkenberg (RWTH)

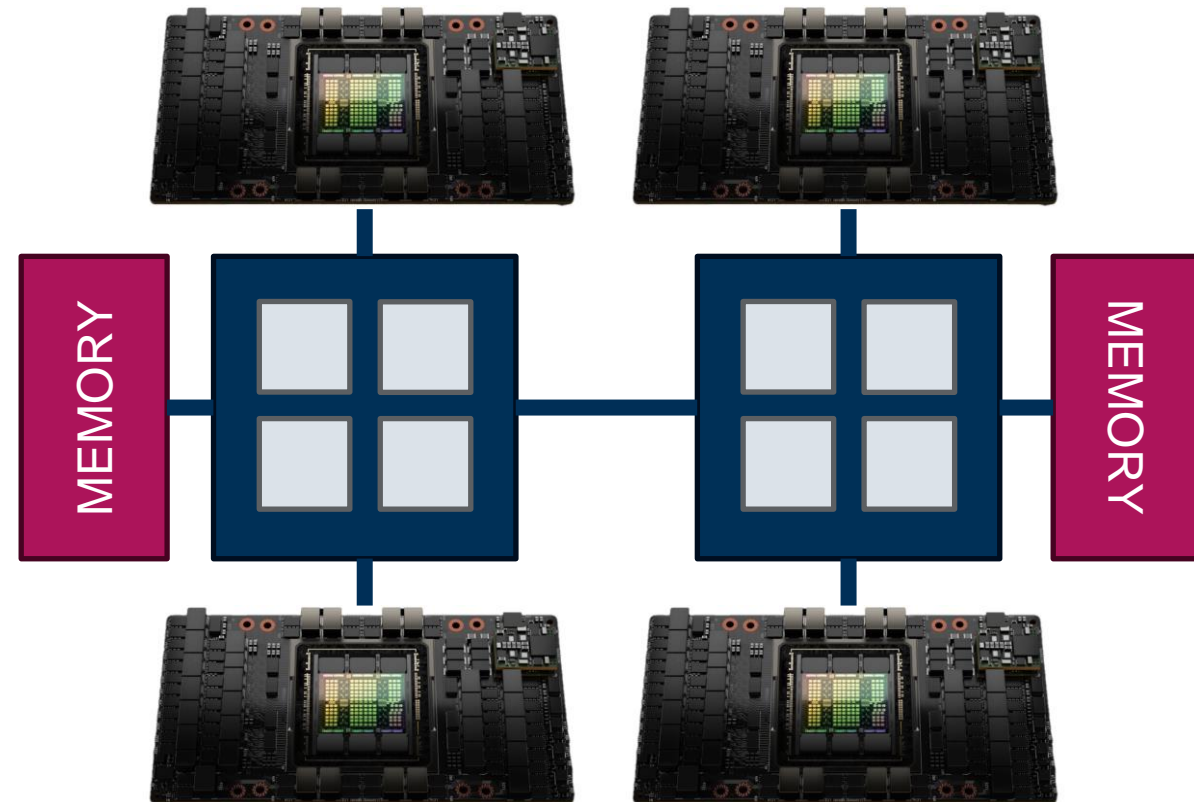
## Acknowledgements / Contributors:

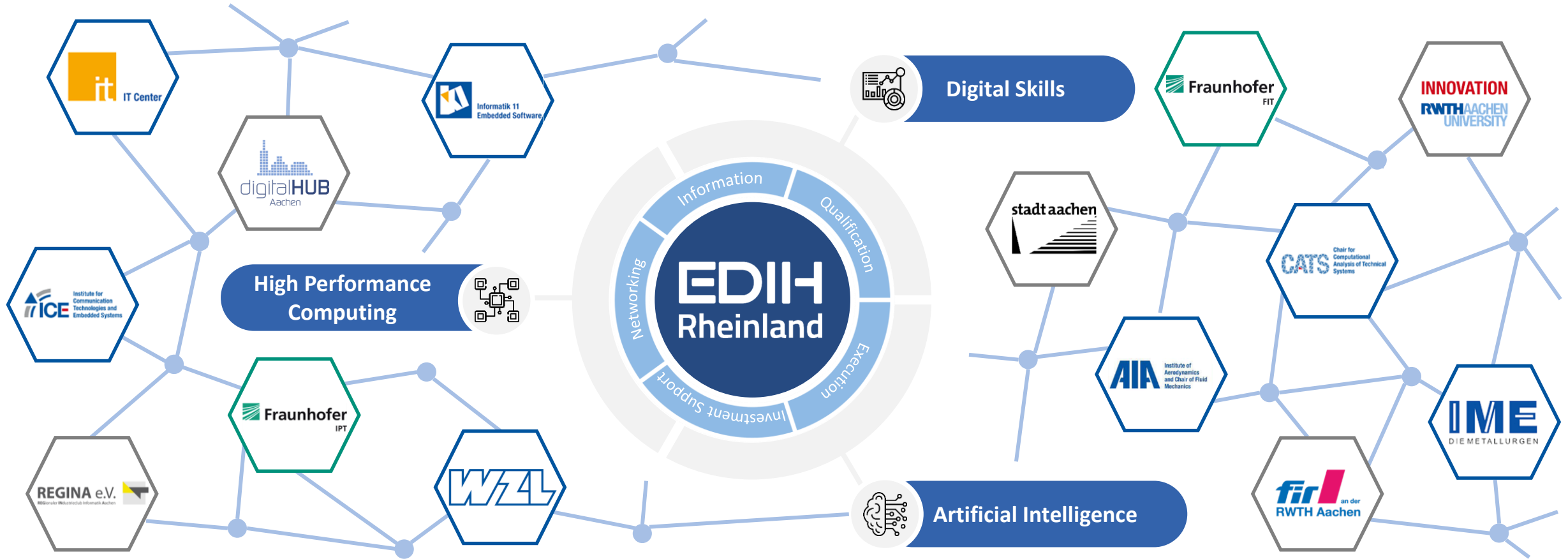
- Georg Zitzlsberger, NVIDIA (formerly IT4I Supercomputing Center, Ostrava)
- Dominik Viehhauser and Radita Liem, IT Center RWTH Aachen University

# What hardware are we using today?

## – CLAIX 2023 (ML Segment)

- 52 compute nodes, each comprising
  - 2x Intel Sapphire Rapids
  - 2x 48 cores @ 2.1 GHz
  - 512 GB main memory
- 4x NVIDIA H100 (Hopper)
- 96 GB HBM2e
- Infiniband NDR network





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