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NATIONALES HOCHLEISTUNGS RECHNEN

EDIH Rheinland

WEST AI KI-Servicezentrum

PPCES: Machine and Deep Learning

Focus and Agenda

DAS KOMPETENZNETZWERK FÜR HOCHLEISTUNGSRECHNEN.

Focus: What to expect?

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- **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 using frameworks (see further links)
  - Unfortunately no time to cover all types of ML / DL such as Reinforcement Learning, LLMs, …
- **Content covered in this workshop!**
  - General introduction into ML / DL
    - Supervised vs unsupervised learning; Techniques: classification / regression / clustering / pre-processing
    - Conceptual side but also examples with different frameworks
    - What is the appropiate 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)

Agenda – Friday, March 20

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Zeit	Thema	Berichtende/r
09:00 – 10:30	▪ Introduction to AI, Machine and Preprocessing Techniques – Part 1	Jannis Klinkenberg (RWTH)
10:30 – 11:00	Coffee 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 + Examples	Jannis Klinkenberg (RWTH)
14:45 – 15:30	▪ Introduction to Distributed Deep Learning + Examples	Jannis Klinkenberg (RWTH)
15:30 – 16:00	Coffee 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?

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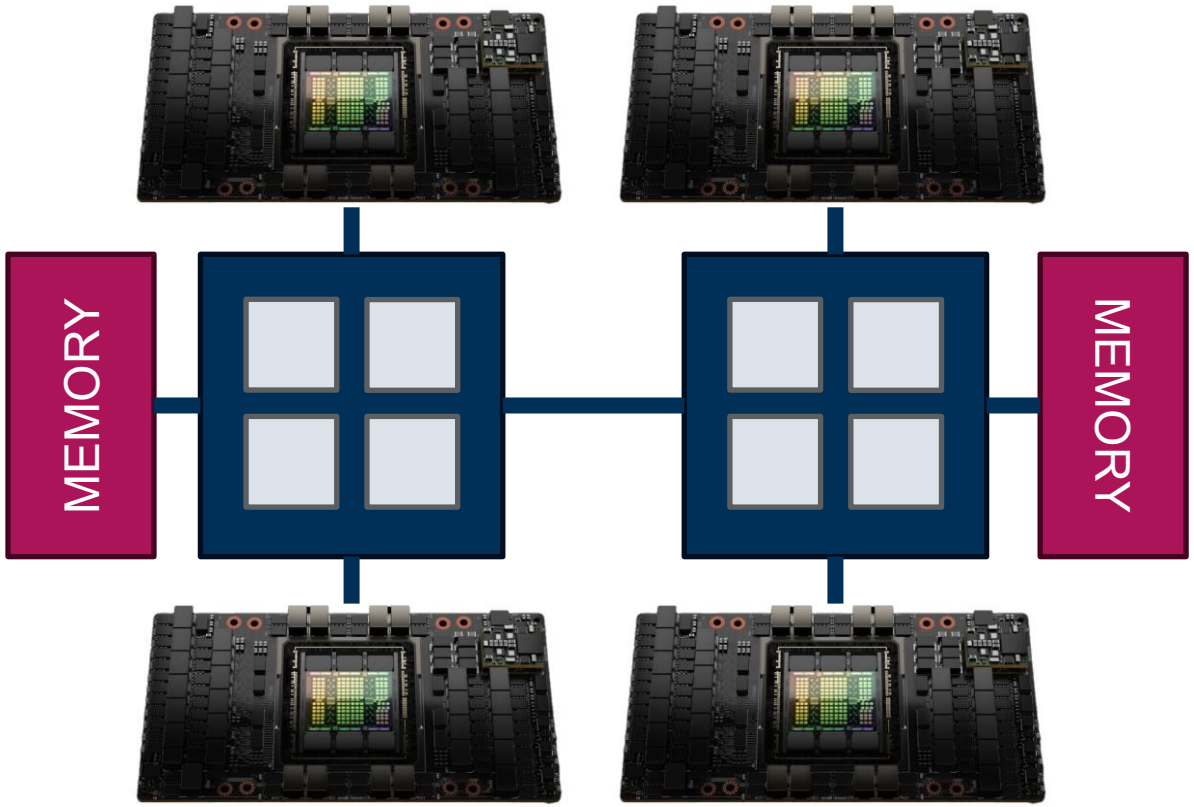
- **CLAIX 2023 (ML Segment)**
  - 52 compute nodes, each comprising
    - 2x Intel Sapphire Rapids
    - 2x 48 cores @ 2.1 GHz
    - 512 GB main memory
    - 4x NVIDIA H100 (Hopper)
    - 94 GB HBM2e
    - Infiniband NDR network



Heterogenes Netzwerk für die digitale Transformation

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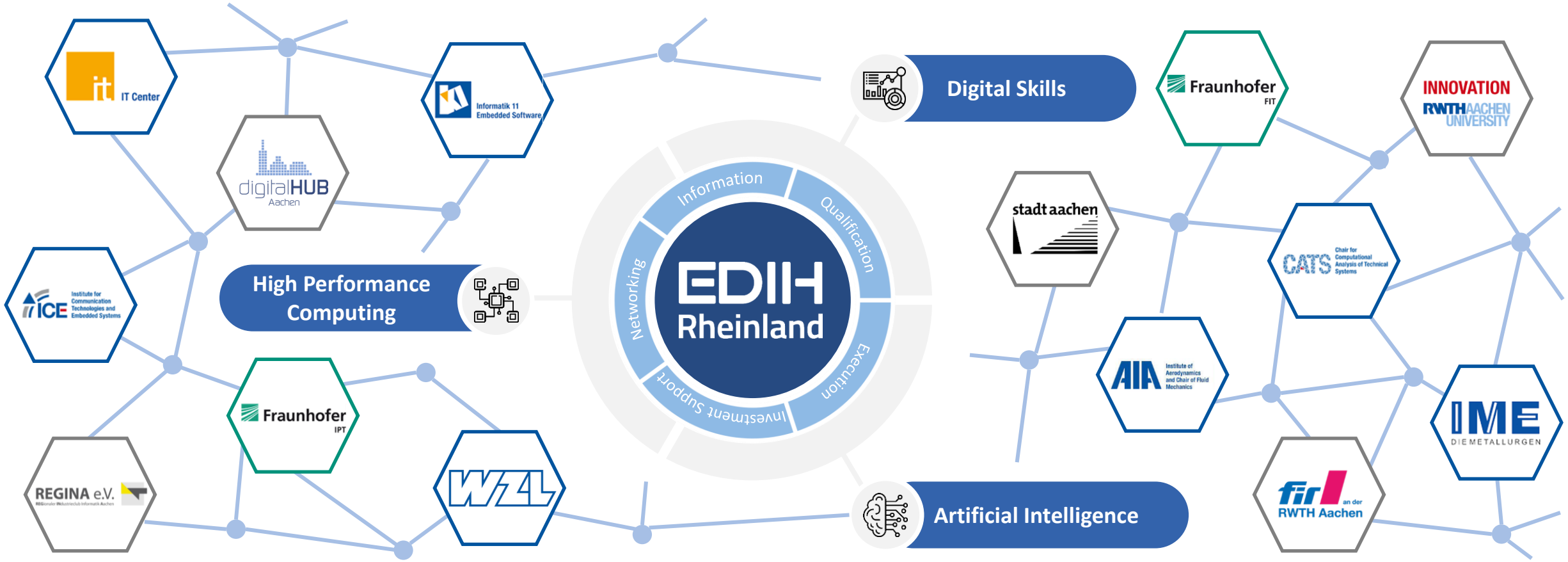

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