

On the Convergence of HPC and AI

Russian Supercomputing Days, September 21, 2020, Moscow, Russia

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Roadmap of the Talk

About HPC

Where do we stand and where are we headed?



Applications

Which applications will we target and which will benefit?



Technologies & Convergence

Which new technologies do we see and how do they converge?



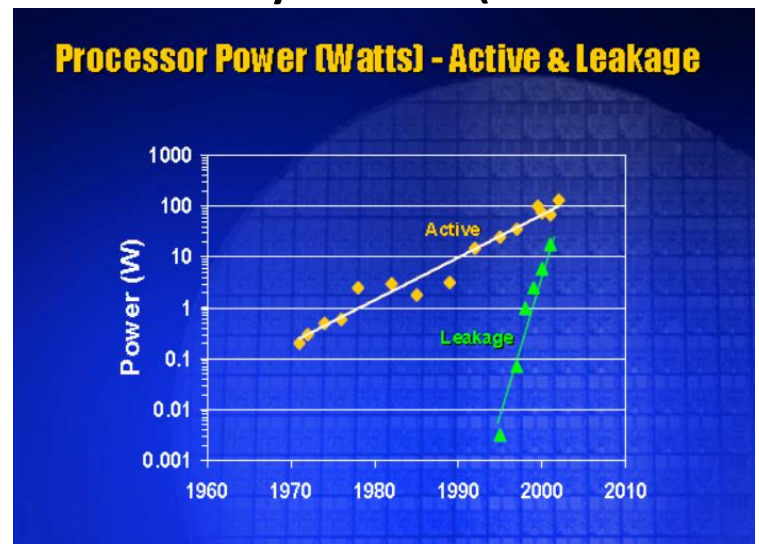
Conclusions

What do we learn and how do we react?

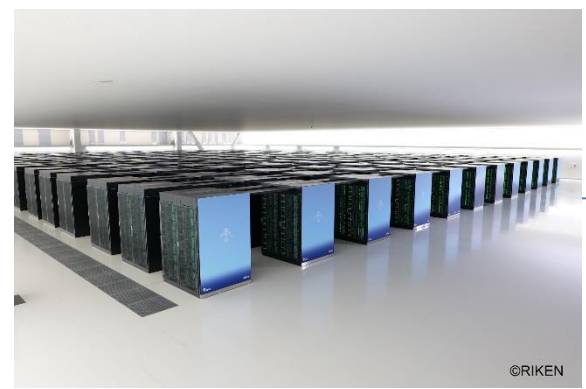
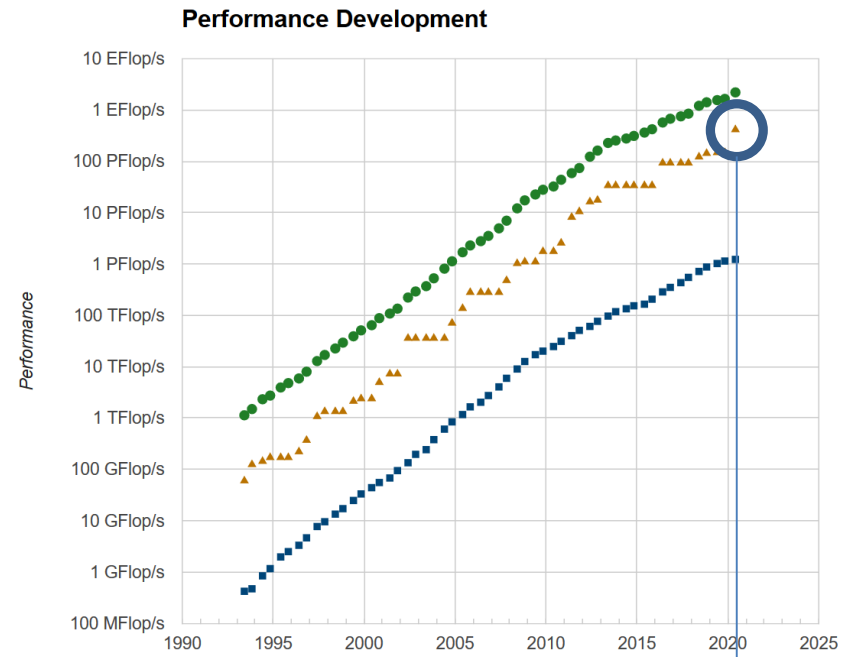


High Performance Computing

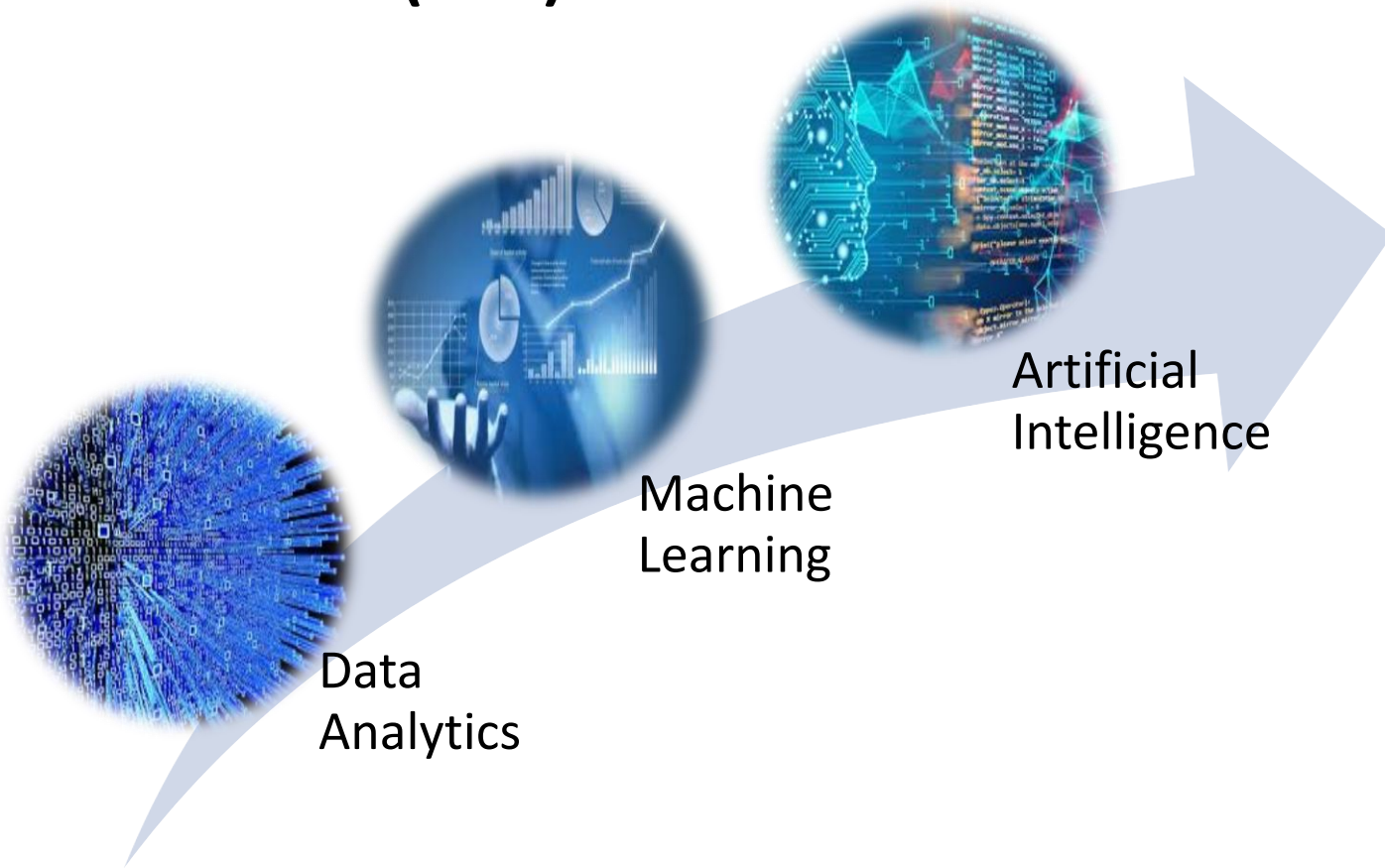
- Growing Peak Speed
- Since 2008 flattening curve
- Issue is Moore's law
- Currently 5nm (most recent)



Gordon Moore, ISSCC 2003



Data to Solution (D2S)





CONVERGENCE OF METHODS

Convergence

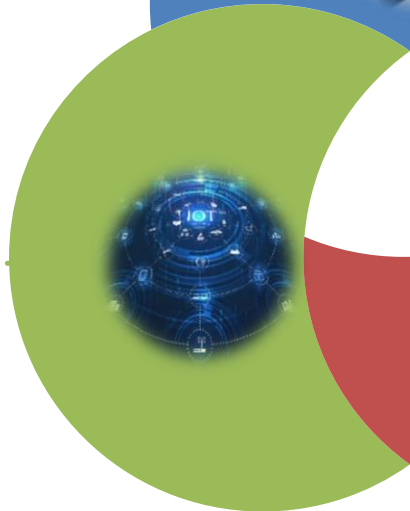
High Performance Computing

Provide high level of performance at all levels



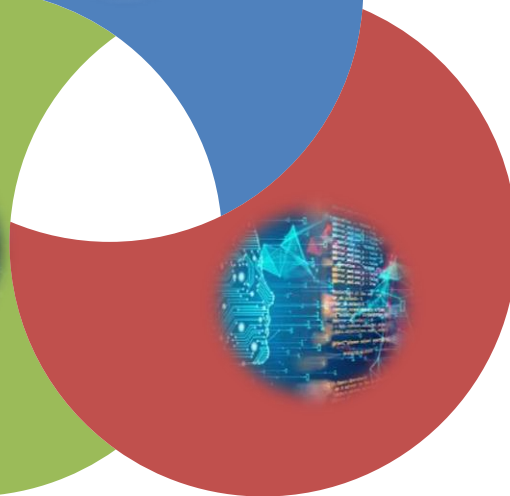
Internet of Things

Connect everything in an intelligent way



Artificial Intelligence

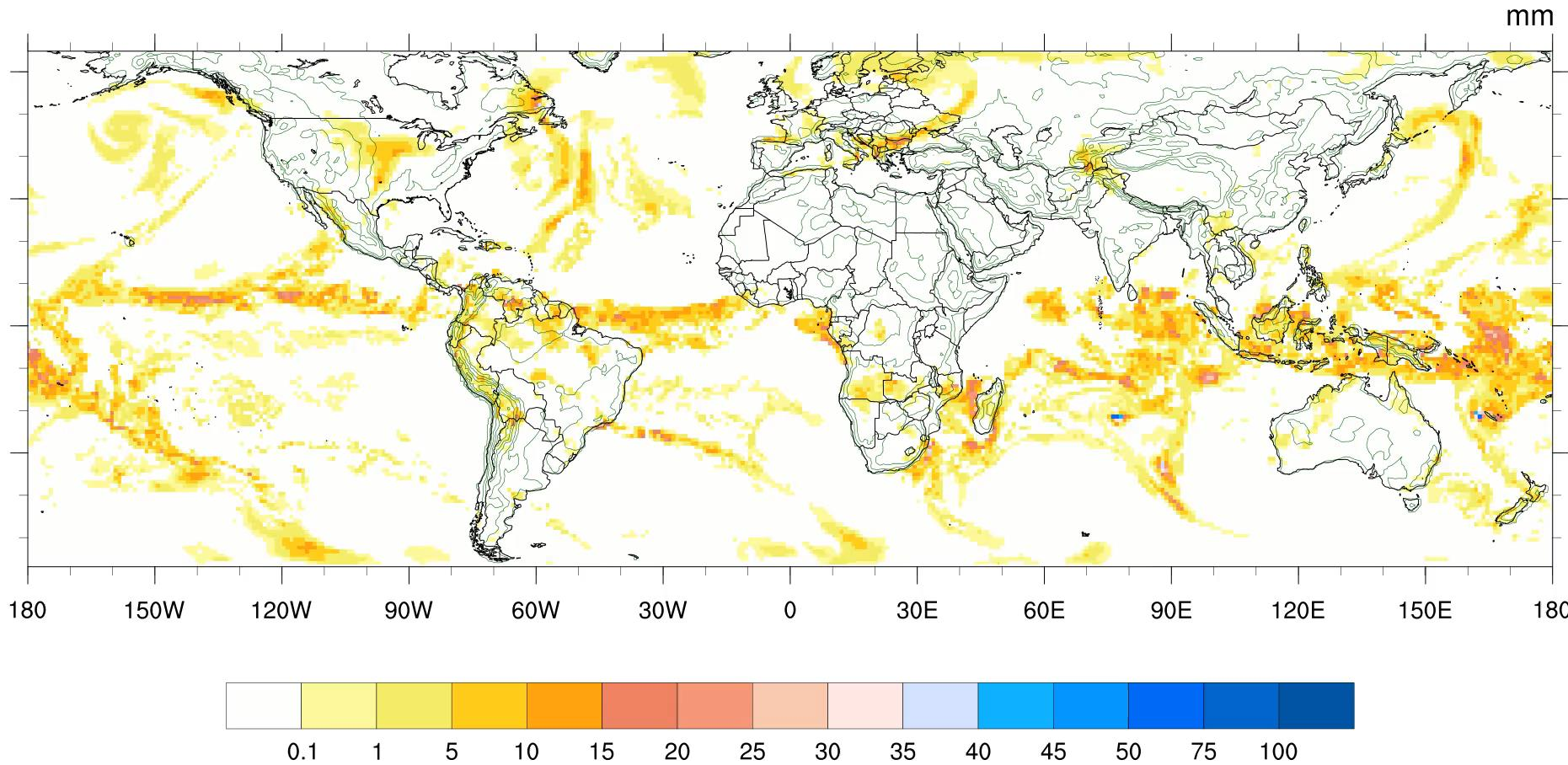
Extract knowledge from data and prepare intelligent decisions





APPLICATIONS

6h precipitation until 2015-02-01_06:00:00



V. Wulfmeyer, T. Schwitalla (Uni Hohenheim)

Pandemic



Source: <https://www.welt.de/gesundheits/article122874241/Forscher-entschuesseln-den-Pandemien-Algorithmus.html>



Source: <https://www.computerworld.ch/technik/ki/fraunhofer-arbeitet-an-tool-fake-news-abwehr-1676121.html>

Smart Citizens for Smart Cities

- Quality of Life
- Decision Making
- Security of Supply
- Mobility
- Work
- Health
- Education
- Entertainment
- ...



Quelle: <https://www.i-scoop.eu/smart-cities-smart-city/>

Conclusions

- Finding
 - HCP is loosing momentum
 - Various technologies come up
 - Technologies converge
- Challenges
 - New challenges for the community as a whole
 - New skills required
 - New research questions lay ahead

Thanks & Questions

