CERN openlab

Workshop Welcome

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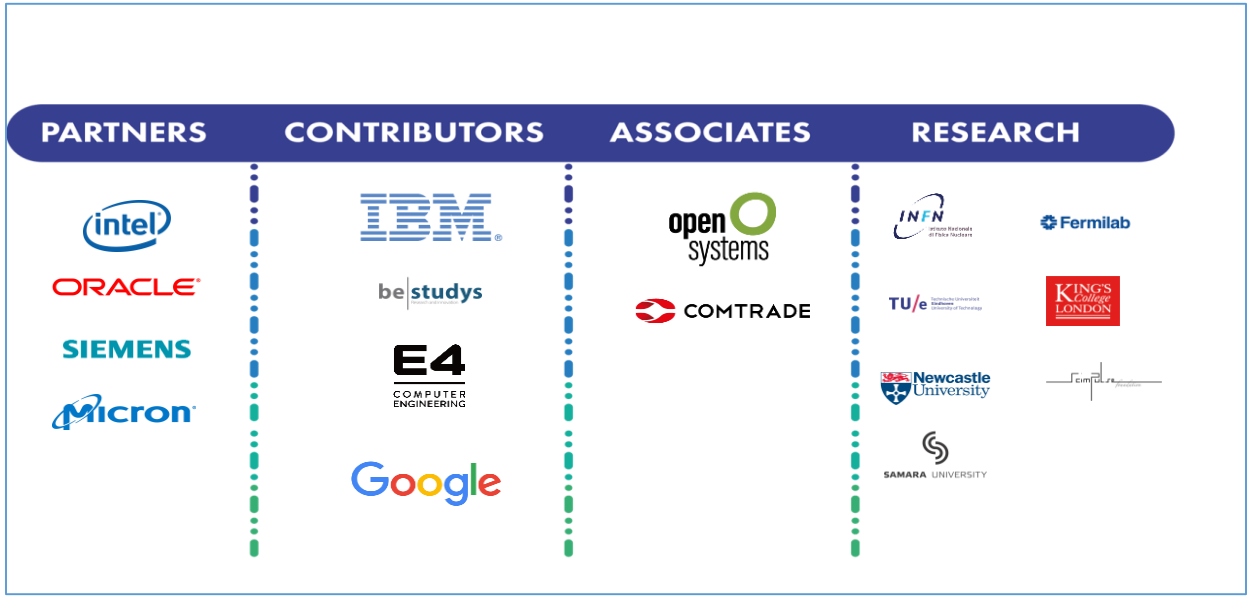
CERN, 22 January 2020

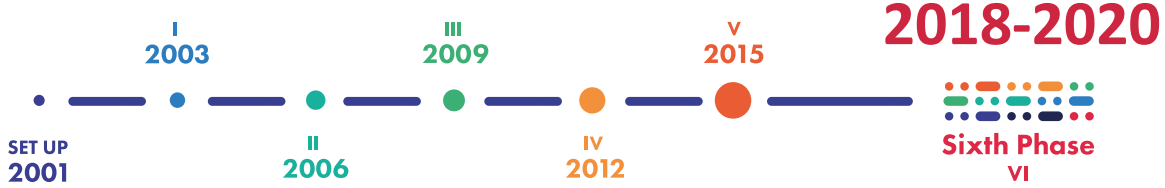
Workshop Goals

Welcome to the annual Technical Workshop of CERN openlab!

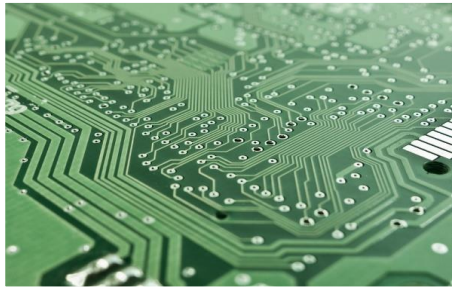
- Today and tomorrow we will review the **current projects** and **discuss ideas** for 2020
- Present **results** and ongoing **investigations** of the many **innovative ideas** and solutions in preparation for LHC **Run3 and Run4**
- Exchange ideas with our **industry members** and gain insights on some of the the most advanced technologies
  - Talks by our industry partners



The CERN openlab Phase VI

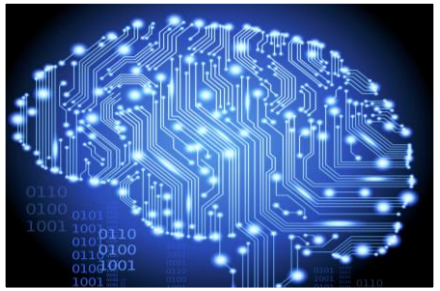


Increase **performance** using **heterogeneous architectures** (CPUs, FPGAs, GPUs, ..)

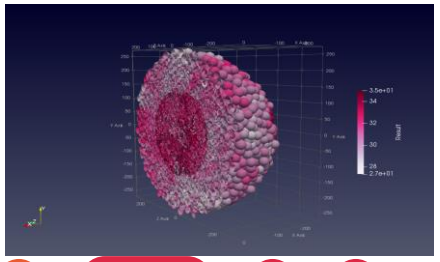


Scale out capacity of processing and storage with Clouds, HPC and new technologies

Change the computing paradigms with new technologies like **Machine Learning, Deep Learning, Advanced Data Analytics, Quantum Computing**



Share solutions with other **Sciences**



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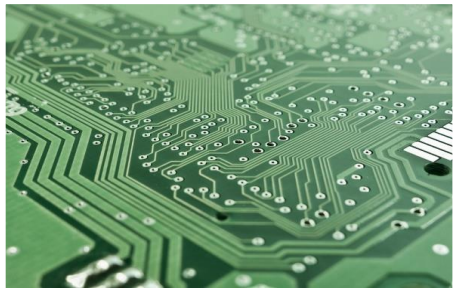
Workshop Themes

Theme 1: Exploring Heterogeneous architectures

Theme 1: **Exploring Heterogeneous architectures** (CPUs, FPGAs, GPUs)

- Data Acquisition and Data Classification
- Data Reconstruction algorithms
- Use of Heterogeneous Architectures in modular HPC
  - Prototyping Modular Architectures: DEEP-EST
- HEP workflows as benchmarks of computing architectures
- Neuromorphic Computing

Theme 1: Exploring Heterogenous Architectures



Workshop Themes

Theme 2: Utilizing HPC, Clouds and enabling technologies

Theme 2: Utilizing HPC and Clouds

- Unified Programming Interfaces/portability libraries
- HEP Workflows on Kubernetes
- Cloud solutions

Theme 2: Utilizing HPC, Clouds and enabling technologies

Theme 2 Database and Storage Solutions

- Database technologies
- EOS Productization
- DNA Storage

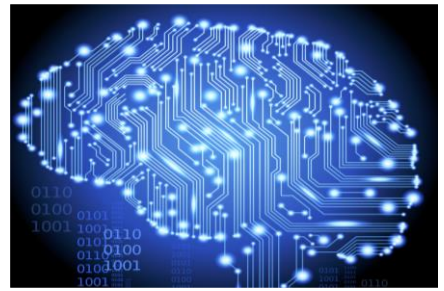
Workshop Themes

Theme 3: Changing Paradigms

ML, DL and Data Analytics

- LHC Industrial Control systems
- Data Simulation
- Data Reconstruction
- Data Analysis

Theme 3: Changing Paradigms
ML, DL and Data Analytics



Quantum Computing

- Quantum GANs
- Quantum SVM
- Quantum Graph for tracking
- Event Classification in Quantum ML
- NP-hard combinatorial problems

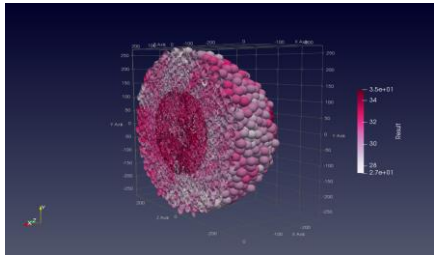
Theme 3: Changing Paradigms
Quantum Computing

Workshop Themes

Theme 4: Sharing Solutions with other Sciences

- CERN Knowledge Transfer and Medical Applications
- Biodynamo
- LivingLab
- SmartLinac
- DL on wearable devices
- Deep Learning in UNOSAT

Theme 4: Sharing solutions with other Sciences



Networking

The CERN openlab Technical Workshop is intended also to foster **networking and collaboration**

- Coffee and lunch breaks are also poster sessions
- Networking Cocktail this afternoon at the end of the sessions

LET’S GET STARTED!