



# VERSATILE INTEGRATED ACCELERATOR-BASED HETEROGENEOUS DATA CENTRES

[www.vineyard-h2020.eu](http://www.vineyard-h2020.eu)

## VINEYARD

VINEYARD Project is coming to an end after three successful years (2016-2019) of working towards accelerating cloud computing in green datacentres, seamlessly.

This final brochure of the project aims at presenting some of the main achievements of the project.

### Novel energy efficient computing engines

- New dataflow engine for Maxeler (DFE)  
3x higher compute performance and 2x lower energy than previous generation DFE

- New FPGA-based servers from Bull  
Low latency interconnect Up to 10x speedup compared to contemporary processor Energy efficient

### High-level programming framework

- Allows end-users to seamlessly use these accelerators in heterogeneous computing systems by employing typical data-centre programming frameworks (i.e. Spark).

- Allow virtualisation and resource management of the accelerator resources through the open-source Vinetalk interface

### Accelstore: Open-source repository for cloud accelerators

- VINEYARD has developed an open-source repository that can be used to host IP cores for hardware accelerators targeting data centre and HPC applications



Access hardware accelerators for several widely platforms

[www.accel-store.com](http://www.accel-store.com)

VINEYARD has developed the first open-source repository that can be used to host IP cores for hardware accelerators targeting data center and HPC applications. It hosts hardware accelerators for:

### Accelerated Cloud applications

Transparent use of FPGAs and GPUs in distributed computing systems through ready-to-use APIs for Spark Efficient resource allocation and virtualization of accelerators through Mesos and VineTalk Seamless integration with Accelerator's store (e.g. Amazon AWS EC2 F1).



### Speedup applications and reduce energy consumption

#### 01 Neurocomputing

Up to 40x speedup

#### 02 Machine Learning

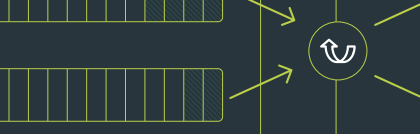
Up to 4x speedup for Logistic regression and K-means

#### 03 Financial Applications

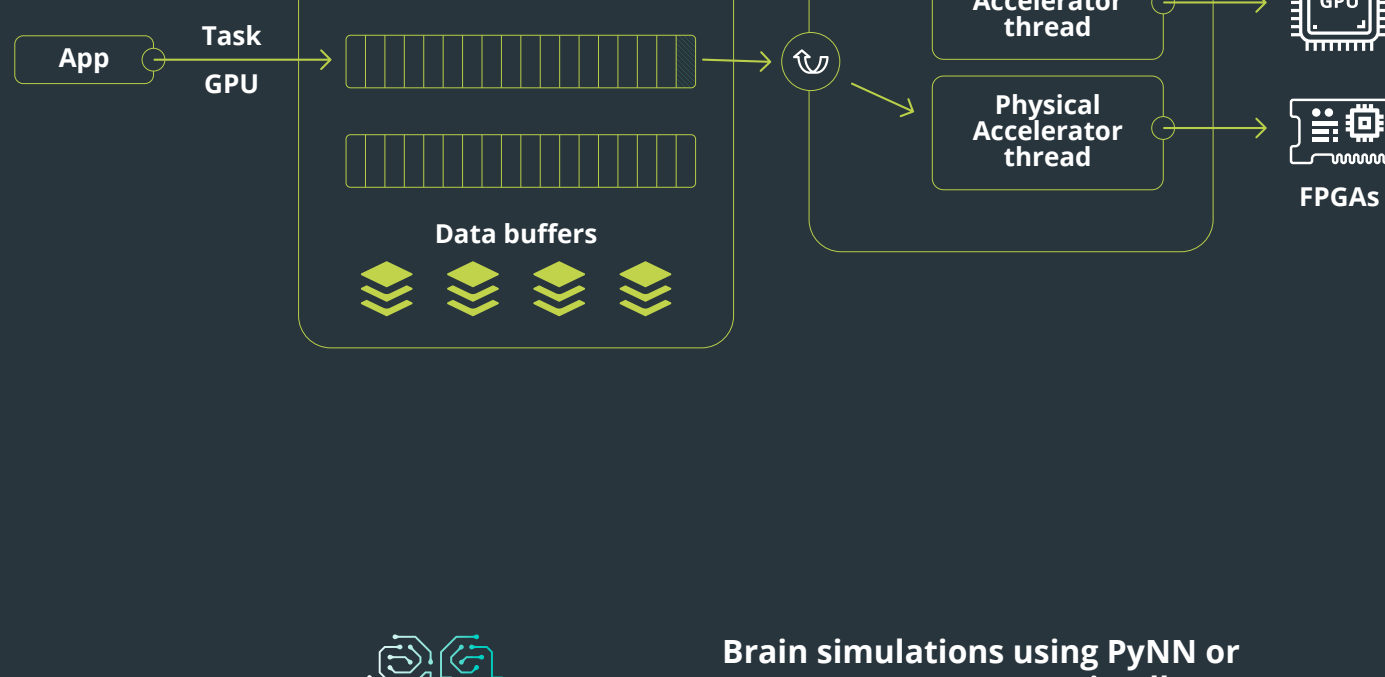
Up to 12x speedup for Risk valuation

#### 04 Data Processing

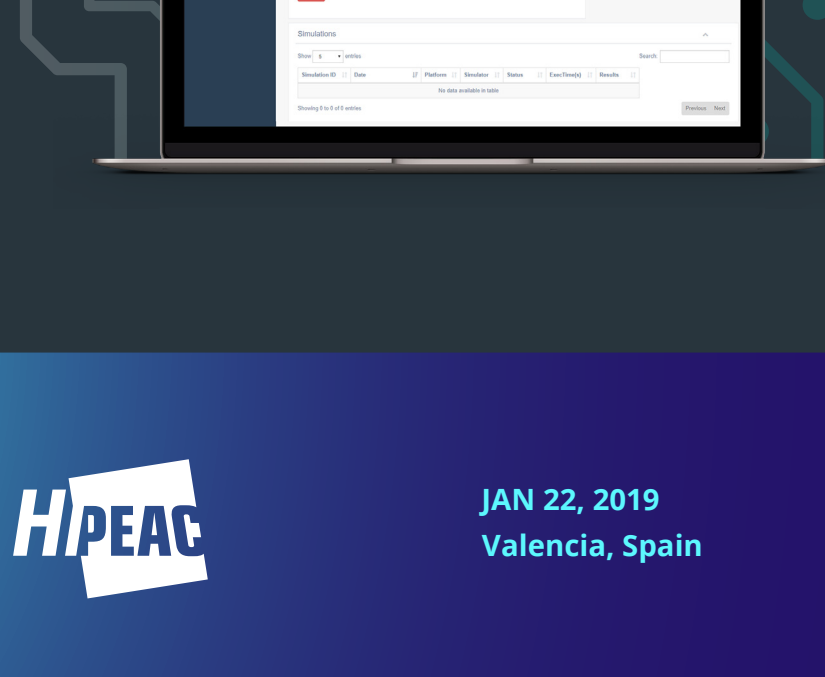
Up to 8x speedup for Filtering, Sorting, Hashing



Simplifying Software Access and Sharing of FPGAs in Datacenters



Brain simulations using PyNN or NeuroML (front-end) & optimally selected heterogeneous accelerators (back-end), transparent use of accelerators



Join as at #HIPEAC2019 where we will have our final workshop to present the results of the Project on the 22nd of January, in Valencia, Spain. VINEYARD will also have a booth on HIPEAC from the 21st to the 23rd, meet us there!

Learn more about VINEYARD's Accel Cloud Workshop [here](#).

[www.vineyard-h2020.eu](http://www.vineyard-h2020.eu)

[www.accel-store.com](http://www.accel-store.com)

[github.com/vineyardh2020](https://github.com/vineyardh2020)

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