

## Category: International scientific projects

**Title:** Designing and Enabling E-infrastructures for intensive Processing in a Hybrid DataCloud (DEEP-HybridDataCloud)

**Title (SK):** Návrh a sprístupnenie e-infraštruktúr pre intenzívne spracovanie v hybridnom dátovom cloude

**Researchers from II SAS:** Ladislav Hluchý, Viet Tran, Martin Šeleng, Martin Bobák, Giang Nguyen, Štefan Dlugolinský, a Ondrej Habala.

**Project type and number:** Horizon 2020 - 777435

**Total funding:** 2 988 750.00 EUR

**Project coordinator:** Agencia Estatal Consejo Superior de Investigaciones Cientificas

**Local coordinator:** Ladislav Hluchý

**Local funding:** 271 250.00 EUR

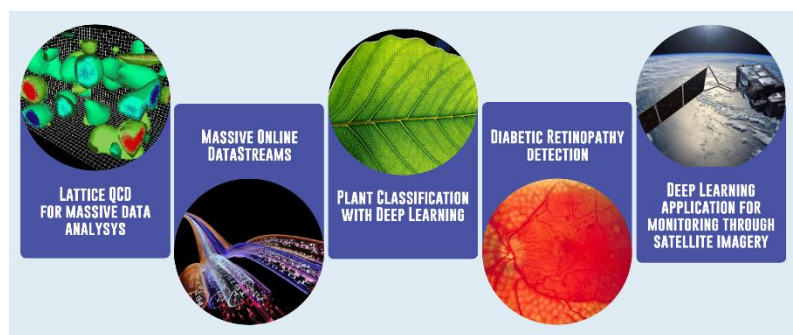
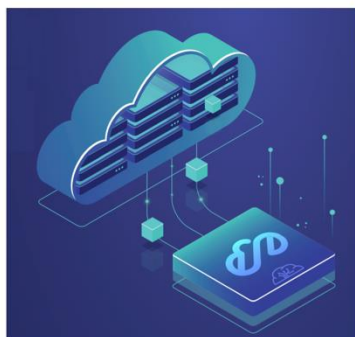
**Duration:** 1.11.2017 / 30.4.2020

**Partners:** total 8 – Czech republic: 1, Germany: 2, Spain: 2, Italy: 1, Poland: 1, Portugal: 1

### Annotation:

The main objective of DEEP-Hybrid-DataCloud project is support intensive computing techniques that require specialized HPC hardware, like GPUs or low latency interconnects, to explore very large datasets. A platform “DEEP as a Service” was developed which is consisted as set of building blocks that enable the easy development of applications requiring these techniques: deep learning using neural networks, parallel post-processing of very large data, and analysis of massive online data streams.

IISAS is the leader of WP4 that deals with the integration of high-performance computing resources and accelerators to the cloud computing resources of the project. This WP will provide a higher performance capacity by relying on real (non virtualized) hardware, as high-end public cloud platforms are providing recently. A uniform access to accelerators was developed in WP4 for different cloud platforms including Openstack, Mesos, Kubernetes and also for HPC. IISAS also involves in WP6 for development of “DEEP as a Service” platform and “Marketplace” service, and in WP2 with MODS (Massive Online Data Stream) use case. Development and deployment of use cases are assisted by CI/CD approach (Continuous Integration/Continuous Delivery) with high level of automation. Two CC papers were published in the project, others are in reviewing.



**Main scientometric outcomes:**

1. NGUYEN, Giang - DLUGOLINSKÝ, Štefan - BOBÁK, Martin - TRAN, Dinh Viet - LÓPEZ GARCÍA, Álvaro - HEREDIA, Ignacio - MALÍK, Peter - HLUCHÝ, Ladislav. Machine learning and deep learning frameworks and libraries for large-scale data mining: a survey. In Artificial Intelligence Review, 2019, vol. 52, no. 1, p. 77-124. (5.095 - IF2018). ISSN 0269-2821. Type: **ADCA**
2. A.S. Alic, M. Antonacci, M. Caballer, I. Campos, A. Costantini, M. David, Š. Dlugolinský, G. Donvito, C. Duma, J. Gomes, M. Hardt, I. Heredia, L. Hluchy, K. Ito, V. Kozlov, L. Lloret, A. Lopez Garcia, J. Marco, L. Matyska, G. Molto, G. Nguyen, P. Orviz, M. Plociennik, Z. Sustr, V. Tran, P. Wolniewicz, W. zu Castell. DEEP: Hybrid approach for Deep Learning. ISC High Performance - The largest event in Europe for High Performance Computing, Networking and Storage with Machine Learning topics. Frankfurt, Germany. 6.2019. Type: **AFK**