PROJECTS

RP1: Advanced computing and big data: algorithms, tools, services

RP2: Mesh algorithms and software tools for large-scale simulation of high-tech materials and processes

RP3: Efficient methods and algorithms for Monte Carlo simulations, sensitivity analysis and stochastic optimization

RP4: Language and content technologies for big data solutions

RP5: Variational and statistical methods for digital science and engineering

RP6: ICT approaches to modeling and simulation of dynamic processes in industry with web-based applications, new services and products

RP7: Development and application of mathematical models and numerical methods for transport and coupled processes associated with mechatronics and biomedical applications

RP8: Advanced computing in analysis of the climate changes impact

RP9: Mathematical modeling and advanced computing in drug design and bioinformatics

RP10: Future web and wireless technologies, data analysis and modeling with applications

RP11: Conceptual modeling and simulation of smart ecosystems

The research projects will use substantially the new infrastructure.

EXPECTED RESULTS

- The CoE will establish Bulgaria as a regional leader in Informatics and ICT enabling leading multi-disciplinary teams of scientists to utilize state-of-the-art HPC resources, storage systems and 3D digitization tools for innovative research with high-tech and socio-economic impact.

- The CoE will integrate the Data Center - as a storage and processing environment; the HPC Complex - as an environment for solving problems with high computational complexity; as well as a team that has the capacity to consult, participate, train, assist with work within the Data Center

- The synergy between supercomputer simulations, big data and artificial intelligence will create an advanced ICT environment for major technological breakthroughs.

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EUROPEAN UNION
EUROPEAN REGIONAL DEVELOPMENT FUND

ICT

OPERATIONAL PROGRAMME SCIENCE AND EDUCATION FOR SMART GROWTH

Project BG05M2OP001-1.0001-0003

CENTER OF EXCELLENCE IN INFORMATICS AND INFORMATION AND COMMUNICATION TECHNOLOGIES

FUNDING

- The project is funded trough the Operational Program “Science and Education for Smart Growth”.

- The total amount of the grant is BGN 29 355 861 (more than15 M euro): BGN 24 952 482 (85%) are provided by the European Regional Development Fund and BGN 4 403 379 (15%) are the national co-financing.

- More than 75% of the project's cost is allocated for building scientific infrastructure.

IMPLEMENTATION

- 03.08.2018 - 31.12.2023

PARTNERS

- Institute of Information and Communication Technologies – Bulgarian Academy of Sciences (Leading Organization)
- Institute of Mathematics and Informatics – Bulgarian Academy of Sciences
- Institute of Mechanics – Bulgarian Academy of Sciences
- National Institute of Geophysics, Geodesy and Geography – Bulgarian Academy of Sciences
- Plovdiv University „Paisii Hilendarski“
- Medical University – Sofia
- University of Library Studies and Information Technologies

ASSOCIATE ACADEMIC PARTNERS

- Institute of Statistics and Mathematical Methods in Economics – TU Wien (Austria)
- Fraunhofer Institute for Industrial Mathematics, Kaiserslautern (Germany)

ASSOCIATE INDUSTRIAL PARTNERS

- Ontotext
- Interconsult BG
- AMET
- TechnoLogica
- Biodit Global Technology
- Orak Engineering

GENERAL OVERVIEW

The main objective of the project is the establishment of a Center of Excellence (CoE), which integrates modern research infrastructure and teams of highly qualified scientists and specialists to conduct basic and applied research. The CoE activities are aligned with the IS3 of the Republic of Bulgaria 2014-2020.

PLANNED INFRASTRUCTURE

- Data Center capable of storing and processing more than 3 PB of data, in accordance with current reliability requirements for power failures, and maintenance organization for capacity expansion ensuring sustainable development.

- Supercomputer Complex based on the latest generation of technologies, with an emphasis on energy efficiency, peak performance over 1 PFLOP/s and 24x7 operating mode, enabling solution of wide range problems with high scientific and social impact.

- Laboratory for 3D Digitization and Microstructural Analysis, which includes industrial computed tomography, 3D laser scanning and dynamic process digitization equipment. The huge amount of data being produced will be stored and analyzed using the new capabilities of the Data Center and the Supercomputer Complex.

The new infrastructure will position the CoE a leader in the complex field of HPC, Grid and Cloud computing, and 3D Digitization.

NEW HPC SYSTEMS since 2019

40 servers Fujitsu Primergy RX 2540 M4 with a configuration:

NVIDIA Tesla V100 32GB
128 GB RAM
CPU 2x Intel Xeon Gold 5118
2.30GHz 24 core
2x800GB SSD
3*12TB HDD

NVIDIA Tesla V100 32GB

Double-Precision Performance:
7 TFLOPS
Single-Precision Performance:
14 TFLOPS
Tensor Performance (AI):
112 TFLOPS

“This is the world’s most advanced GPU ever built to accelerate AI, HPC, and graphics.”