EURO

Prof. DSci Ana Proykova– Training and Skills Development: Training for Large RIs

NCC Bulgaria and NCC UK: Collaboration and Twinning Activities
18-20 July 2022, Sofia, Bulgaria

Layout

1. LSRI in ENE, ENV, PSE, H&F, SCI, ICT (ESFRI classification)
2. Why are interesting for EuroCC NCC?
3. Goals of interaction EurocNCC BG - LSRI in the BG roadmap
4. Analysis
5. Ways forward – success stories
6. Twinning
7. Conclusions

What are the Large scale research infrastructures (LSRIs)?

A LSRI is highly demanding facility, in terms of knowledge, technology and financial resources needed for its construction, operation and investments.

Total financing cost at least 1000 000 (local currency)

At the national level they are funded through the BG roadmap on research infrastructures (the lately updated version 2021) – national budget voted by the council of ministers

Why are they interesting?

Serve the scientific communities - ENE, ENV, PSE, H&F, SCI, ICT

Pan-European:
EUROARGO, BBMRI, ACTRIS, CLA-DA, EuroBioImaging, … examples

National:
INFRAMAT, GIS, RINA, CoE & CoC (OP SESG 2014-2023)

GOALS

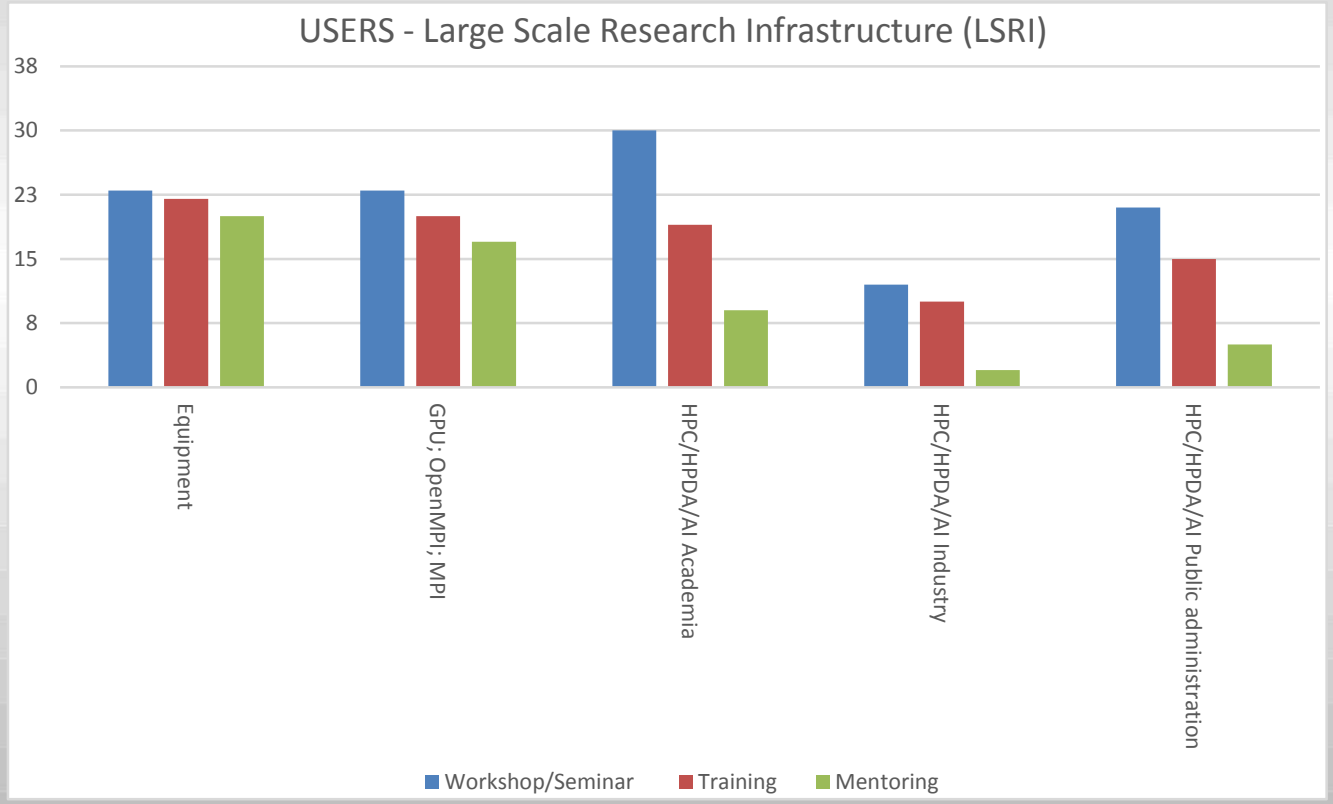
- understanding the compute, software and facilities requirements of the Large Scale Infrastructures in Bulgaria
- Discover the interest and readiness for HPC/HPDA/AI adoption
- Tailoring courses in HPC/HPDA/AI for training of researchers in different domains: ENE, ENV, PSE, H&F, SCI, ICT
- Skills at different levels (beginners & experts)

Action

Survey – two questionnaires:

providers of HPC/HPDA/AI services)
Users

Finding (users)
Clear distinction between larger scientific projects, distributed infrastructures, and huge physical installations has to be clearly made


USERS - Large Scale Research Infrastructure (LSRI)
38
30
23
15
8
0
Equipment
GPU; OpenMPI; MPI
HPC/HPDA/AI Academia
HPC/HPDA/AI Industry
HPC/HPDA/AI Public administration
Workshop/Seminar
Training
Mentoring

The needs of training identified:
ENE, ENV (advanced training in Big Data Analytics and Artificial Intelligence)
Health and Food (beginners in HPC/HPDA/AI)
SCI (both – beginners and advanced users in HPC/HPDA/AI)

Providers of the training:
CoE in ICT (pillars of EuroCC NCC BG)

EuroCC NCC BG

Q1 & Q2	Q3 & Q4	Q5 & Q6	Q7 & Q8
Master & PhD courses in HPC/HPDA/AI	Questionnaires analysis, actions	Training of ENV users	Exchange of materials with EuroCC BE (AI)
Hands-on materials for skill development in ENE & PSE –	Consultations for SME in auto-sector for AI usages towards SME meeting in Bourgas	Support of new comers (success story)	Science conference HPC/HPDA/AI in preparation for the autumn 2022

SUCCESS STORY IN TECHNOLOGY ADOPTION

COMPANY XY

1. FTS Group provides business software

THE PROBLEM

strive to be an early technology adopter, so that we can provide the best solutions for the success of our customers descriptive and predictive analyzes

SUCCESS STORY DETAILS
HPC hybrid cluster provider via Cloud
Domain:retail & transport

THE HPC PROBLEM DOMAIN: RETAIL COMPANY

By implementing several AI algorithms for analysis and predictions of the component delivery using the HPC cluster allowed the company to use very large datasets. The large amount of data (Big Data) ensured the speed up of achieving a reliable solution for predictions of component delivery in time. The use of high-performance computing (HPC) enables grocery stores to quickly track inventory, manage warehouses and orders, and keep an eye out for deals that will attract customers..

THE SOLUTION

The availability of pre-defined retail and transportation decisions makes the solution based on the AI controlled convergence of component delivery, useful for other companies than FTS. The current implementation of the solution allows the FTS company to enter a new market niche in the field of business analyzes and predictions both on the Bulgarian and international market.

THE BENEFITS

The FTS was recognized by the Technomarket as a reliable partner in the retail market due to the successful cooperation with the EuroCC NCC BG team. Another benefit is that the innovative solution for both retail and transport companies helped them to receive significant market advantage, to increase their opportunities to attract of foreign customers for the period of one year only. More is expected for the next year.

SUCCESS STORY IN AUTOMOTIVE INDUSTRIAL DOMAIN

COMPANY XY

1. Software Company LTD

THE PROBLEM

Implement a low-cost, low-latency, high accuracy gesture recognition solution that can be deployed on different edge platforms such as the NVIDIA Jetson Nano

SUCCESS STORY DETAILS
HPC provider:HPC Cloud
Domain Expert:Robotics
Country: Bulgaria
Link:

THE HPC PROBLEM DOMAIN

Using a HPC machine also allowed the team to work with much larger datasets that a regular workstation computer would not even be able to load into memory. The final output of this process is an optimised model running inside a NVIDIA docker container that can be directly deployed to an NVIDIA Jetson Nano and can make use of the Jetson Nano's onboard GPGPU processor.

THE SOLUTION

Using novel approaches to the problem: EAVISE - the final implementation is based. As a result, a small footprint neural network was created, which consists of CNN and a multi-stage TCN that allows to work with low-resolution images taken by cheap thermal cameras. This solution was implemented inside the BonsAPPs AIAsset framework, as part of the BonsAPPs challenge. This framework abstracts away the hardware platform on which the AI app runs on allowing us to focus on the AI app instead of hardware specifics.

THE BENEFITS

The Software Company Ltd. was recognized by the BONSAPPS as a reliable partner due to support by our team, resulted in a solution of an important problem using cutting-edge scientific research: implementing HPC technology to improve both the development process and the quality of the final AI application.

EURO

Twinning with other EuroNCC:

Teaching materials – available on demand (English/Bulgarian)

Intensive courses in MPI, Python, Intro to HPC for pedestrians

Train-the trainers course (s) – the role of champion (s)

Participation in thematic seminars, organized by EuroCC & CASTIEL

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