Towards a vibrant European network of AI excellence centres

ICT-48-2020 – RIA

Call Outline

- **Two actions**: RIA and CSA. RIA targeted here
- **Submission date**: 13 November 2019
- **Main Challenges and Goals**:
  - To ensure European strategic autonomy in AI
  - Up to 4 CoE funded, ~12M EUR each
  - CoE = a network of competences and resources becoming a shared facility for user applications and a high-visibility virtual laboratory
  - Each network should be driven by leading figures in AI from major excellent research centers
  - Strong industrial participation and relevance
  - Strong focus on education and competence building
  - Focus on development of AI technologies, but with solid, multidisciplinary, application-driven objectives
  - Great interest in trustable, explainable AI (validation, bias reduction) and privacy-preserving methods
Main Motivations for CERN

- Organize, structure and fund the ongoing research in AI, currently happening (often at best effort) in many different places (IT, EP, Exp., EN, BE, etc.)

- Ensure the development of a sustainable network of skills and resources to support the evolving HEP experiments computing models

- Put scientific research case at the core of the proposal at the same level as mainstream industrial or societal use cases
Possible Structure (1)

- **Apps**
  - Scientific Research (HEP, Astro)

- **Access**
  - User interfaces, APIs, workflow management, etc. (REANA, SWAN, etc.)

- **Algorithm**
  - ML/DL, Explainable AI, GANs, image analysis, sensors, etc.

- **Resources**
  - Computing (HPC centres, cloud resources) and Data (e.g. Copernicus, many community-specific data sources)

**External**
- Internal CERN/HEP
- Internal non-CERN/HEP
Suggestions for possible members?

Hub and spokes structure

The spokes should be regional mini-hubs and provide clusters of resources+research +applications and access to local competence and users networks
Education

- The call has a strong focus on education and competence building
- Capitalize on existing CERN programmes (CERN openlab, CSC, DOCT programmes, etc.)
- Priority on joint academia/industry programmes (ITN-style)
- Possibility of setting up visiting scientists/experts programmes in collaboration with leading universities
Ongoing Discussions at CERN

- **IT**: CERN openlab, the Data Analytics team in DB, REANA, resource monitoring, etc.
- **HEP Experiments (LHC and non-LHC)**
  - Interest in developing and validating efficient methods for different workloads (DAQ, Reco, data reduction, analysis, simulation, ML/DL applies everywhere) and building expertise in new platforms
- **SFT**
  - Interest in further developing MI/DL competences and tools (Root, SWAN)
- **BE, EN**
  - tools and algorithms for data reduction, anomaly detection, edge /IoT applications, robotics
- **KT**
  - Currently developing a concept for a CoE in AI at CERN. However, the meaning they give to this is a place at CERN where external companies can get consultancy. It could become (one of) the interface to the network of industrial applications
  - KT/MA has contacts with the medical community (apps, expertise, data)
Ongoing Discussions outside CERN

- A few HPC centres: FZJ, CINECA, BSC, CSCS
- Cloud providers (T-Systems, Google, Amazon, Microsoft, etc.)
- Technology providers (Intel, Nvidia, Google, etc.)
- Universities: many contacts in Italy, France, Germany, Ireland, SEE, still to be structured in a logical cross-complementary form
- Non-HEP applications: contacts with communities in medical research, automotive, food & agriculture, finance, but someone else should lead this part
  - This must have a strong industrial relevance