ICT PHD

Research project for a PhD curriculum in ICT – Computer Engineering and Science

Tutor:
Giacomo Cabri

Co-Tutor:
Luca Bedogni

Proposed Title of the research:
Smart AI for a Sustainble Industry 4.0 Transition

Keywords – (5)
Distributed Systems, Machine Learning, Industry 4.0, Anomaly detection, Predictive maintenance

Research objectives: – (max 10 rows)
The research aims at proposing novel and innovative techniques for sustainable smart AI algorithms for Industry 4.0. We focus on a distributed scenario in which nodes collaborate to achieve a desired objective, with a focus on computation offloading and on efficiency.
The research will also focus on the effectiveness and practical deployments of such algorithms in a real scenario.

Proposed research activity – (max 10 rows)
The research tackles different problems in IoT systems.
At first, it will focus on off the shelf algorithms and optimize them with respect to computational complexity. Here the main objective is to understand which parts of the algorithms can be offloaded to Edge nodes, regarding data which has to be analyzed and to the constraints of the system.
The research will also focus on the heterogeneity of the scenario, in the sense that the foreseen algorithms should be flexible enough to be deployed in different scenarios, adapting to a multitude of industrial machines, operating requirements and computational constraints.

Supporting research projects (and Department)
This project will be carried out at the Department of Physics, Informatics and Mathematics and will be supported by research funds provided by Prof. L. Bedogni.

Possible connections with research groups, companies, universities.
The research may involve the undergoing collaborations with research groups at:
- Bologna (Prof. Bononi)
- University of California, Irvine (Prof. Levorato)
- IMDEA Networks (Prof. Fiore)
- Univeristà la Sapienza Roma (prof. Mecella)
- GK Software, Germany