USEEU8 - Smart Industry 4.0 Systems

Mis à jour le 05-07-2024

Code : USEEU8

Unité spécifique de type cours

3 crédits

Responsabilité nationale : EPN05 - Informatique / Pedro BRACONNOT VELLOSO

Présentation

Prérequis

Computer networks, Introduction to Machine Learning, basic principles of security and linux.

Objectifs pédagogiques

The main goal of this course is to cover the main aspects related to Smart Industries 4.0 systems. Students will be capable of understanding the importance of AI to Industry 4.0 as well as the different kinds of applications. The course also presents security and sustainability issues concerning Smart Industry scenarios.

Programme

Contenu

The course is divided into two parts. In the first part, the students will learn all the theoretical aspects as described below. In the last past they will focus on practical aspects with directed studies on an Edge distributed platform with green nodes.

Topics:

Artificial intelligence

- The Role of Artificial Intelligence in Industry 4.0
- Machine learning, deep learning,
- Behavioral and generative Artificial Intelligence
- Big Data Analytics and Industry 4.0
- Some examples of AI for the Industry 4.0

Cloud services

- Cloud Networking and Computing for Industry 4.0
- Digital Twin for Industry 4.0
- Additive Manufacturing

Connected worker

- Human-Machine Collaboration in Industry 4.0
- Networks for connected workers
- The role of public and private 5G

Digital twin

- Digital twin potential
- Digital twin schemes
- Digital twin exemples

Edge

- Edge Computing and Edge Analytics in Industry 4.0
- Embedded Edge for the Industry 4.0
- Networks for the Edge

Extended reality

- Augmented Reality and Virtual Reality in Industrial Settings
- Metaverse for Industry 4.0
- 6G vision for Industry 4.0

Industrial IOT (IIOT)

- IoT Applications in Smart Manufacturing

- Robotics and Automation in Modern Factories
- Predictive Maintenance and Condition Monitoring

Security and sustainability

- Cybersecurity Challenges in the Era of Industry 4.0
- Blockchain Technology and Supply Chain Management
- Sustainable Practices in Industry 4.0

complementary content: Metaverse, blockchain.

Modalités de validation

- Contrôle continu
- Examen final

Description des modalités de validation

Lab reports.