Master IOT

Master Internet of Things

Program description

The Master Program Internet of Things (IoT) is a master program of the federal Université Bourgogne Franche-Comté (UBFC). It aims to train high-level specialists in the design, development and deployment of mobile and distributed solutions integrating connected objects. According to CAGR, the Internet of Things market will reach 560 billion dollars by 2022 and will grow by more than 20% per year. This market is currently $170 billion. From a technical point of view, IoT is at the intersection of network, cloud computing, big data, mobile development technologies and embedded distributed computing. Many practical applications exist ranging from monitoring wind turbines to voice assistants like Alexa and Google Home through autonomous vehicles. The IoT master program is an international master whose courses are all taught in English. A large number of Teaching Units (UE) are shared with UEs of the engineering cycle of the University of Technology of Belfort-Montbéliard (UTBM). The international dimension of the master allows to offer a wide range of experiences abroad for registered students (internships, semesters of studies…). This international openness is based on the many partners, both academic and industrial, of UBFC.

Keywords : Big data, Cloud Computing, IoT mobile applications, Machine learning, Security, Sensors and Sensor Networks, Indoor Localization.

Objectives

- Design, develop and deploy mobile and distributed applications and infrastructures
- Design prototypes and create mobile applications
- Design and build distributed and multi-core applications
- Design tools and deep-learning approaches for processing and analyzing Big data
- Use the main development environments: Android, J2E, and IOS
- Program modular robots for programmable material
- Consider security in connected object systems.

Course Description

The IoT master program will offer a whole set of courses (including a part shared with the UTBM engineers' courses) aimed at training high-level specialists in distributed computing, network technologies, big data, cloud computing, and development of mobile applications. The program also leaves an important place for complementary courses in management, entrepreneurship and French culture.

First Year

SEMESTER 1 FALL (OCTOBER – JANUARY)
Advanced algorithmic (Acquire skills on advanced algorithmic, Data structures, Routing algorithms, Geometric algorithms, Parallel algorithms, Algorithm analysis)

- Mobile development (Design, development and deployment of IOT and mobile applications)
- Infrastructure and routing for connected objects (Explore the architecture and key equipment for objects, communication and routing protocols for IOT)
- Data mining (basics of big data and machine learning tools)
- Team management and communication
- English.

SEMESTER 2 SPRING (FEBRUARY – JUNE)

- Radio networks (Acquire the skills on the technical and functional speci cations of the mobile networks GSM/GPRS/EDGE (2G), UMTS (3G) and LTE (4G))
- Positioning systems: techniques and applications (geographic information system, Indoor positioning systems, GPS positioning, …)
- Embedded systems (Understand the low level aspects necessary for the development of embedded computing, integration of software modules (operating systems, drivers))
- Cloud infrastructure and virtualization (cloud computing issues, cloud concepts and aspects of security, data protection, backup, elasticity, fault tolerance, deployment, virtualization) Foreign language
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- Mini project at the lab

Second Year

SEMESTER 3 FALL (OCTOBER – JANUARY)

You must choose 2 blocks among the 3:

Block 1

- Deep learning (DL) for IoT (general ideas behind DL, Design some DL architectures, link between data of IoT and
- DL) Security for connected objects

Block 2

- Mobility in smart cities (design mobility, dynamic, and location-based services)
- Modular robots programming and swarm robotics (introduction to distributed algorithmics dedicated for programming modular robots, MELD)

Block 3

- Agent-based Modeling and Simulation for IoT (computer simulation and agent based simulation, incomes and outcomes of a simulation scenario, etc)
- Perception and interactions for IoT (with GUI) (describe the different types of sensors, their behaviour and their limitations, design and develop algorithms for data processing, data analysis and data fusion)

Compulsory course

- Main Research Project
- Team Management and Innovation & Entrepreneurship

SEMESTER 4 SPRING (FEBRUARY – JUNE)

- Research Internship.

Scholarship program

Université Bourgogne Franche-Comté offers scholarships of excellence (up to 800 euros per month, up to 10 months) to high quality international students. As an international postgraduate you will have access to a wide range of funding programs (Grants from French embassies, AUF bursaries, etc.).

Student ProSle

- To be eligible, candidates need a Bachelor's Degree (minimum 3 years of higher education) in computer science or applied mathematics
- Certi ed B2 level in English.

For the Master 2 degree, the candidates need:

- A 4-year Bachelor's Degree in Computer Science or Applied
- Mathematics Certi ed B2 level in English

Contact:

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