Internship Proposal for MASTER 2

Topic	**Comparative study of EOS and IOTA blockchains int he context of Smart IoT for Mobility**
Level	Student in a MSc degree in Telecommunication or Electronic Engineering
Starting date	1st of March or 1st of April 2020
Duration	6 months
Team(s)	MCSOC
Keywords	Blockchain, hardware/software, low power
Supervisor(s)	François VERDIER (PR UNS)
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Training Place(s)	LEAT, Campus SophiaTech, Bâtiment Forum, 930 Route des Colles, 06903 Sophia Antipolis
Financial reward	Approximately 550€ / month
Funding	LEAT

Context	Smart Contracts is a new technology running on the blockchains. The blockchain technology is a new decentralized, visible and and secured digital register system allowing to send and save transactions. Once the transactions are recorded on the blockchain they cannot be modified anymore [1]. Today blockchain technology is one of the most secure technologies in the world. To have such a secure environment this technology has a very high energy consumption. The aim of the MCSOC team in the Smart IoT for Mobility project is to minimize the energy consumption so that this new technology can be available for IoT devices. Today, the Smart IoT for Mobility project focuses on the use case of Renault: in an accident, the vehicles send data to the blockchain and this data is processed by dedicated Smart Contracts. The trainee should study certain types of blockchain, and find limits of this technology in the deployment in blockchain network consisting of IoT devices. In the deployed blockchain network the trainee will also measure the consumption on IoT devices participating in this network.
Summary of the research proposal	♦ Theoretical study of different types of blockchains: • ***IOTA [2]:*** ➢ Deep study of the rules of consensus and the structure of the Tangle ➢ Study of the Qubic layer [3] that can realize Smart Contracts on IOTA • ***EOS [4]:*** ➢ Deep study of consensus rules and structure of this type of blockchain ➢ Study of Smart Contracts used by EOS (in C ++) ♦ Deployment of IOTA blockchain networks with a Qubic network on the one hand and EOS on the other hand. The network contains PCs, microPCs and microcontrollers (eg Raspberry Pi, i.MX 8M). Find limits and portability on IoT devices.

	♦ Study the interactions with Smart Contracts on these networks, create an application layer that calls, displays and communicates with specific Smart Contracts corresponding to the use case of Renault. ♦ IoT devices consumption measurement when the IoT device is a simple node and a "minor" of network. ♦ Deploying a system with sending only the hashes of the data within the blockchain transactions and, in parallel, this data would be sent within a decentralized database (for example as IPFS [5] suggests).
Required Skills	Microcontroller programming, C / C ++, (Python is an advantage), knowledge of microprocessor architectures, basic knowledge of architecture's consumption.
Suitable Skills	Linux, hardware layer, network communication.
References	[1] N. Massiera, "Projet Smart IoT for Mobility", Laboratoire LEAT - UMR CNRS 7248, 2017. [2] https://www.iota.org/ [3] https://qubic.iota.org/ [4] https://developers.eos.io/ [5] https://github.com/ipfs

This internship could eventually lead to a Phd thesis