



DOCTORATS  
INDUSTRIALS



# PROJECTE DE DOCTORAT INDUSTRIAL EXPEDIENT 2016 DI 059

## DADES DE L'EMPRESA I DE L'ENTORN ACADÈMIC

### **Títol del projecte**

Resource and Spectrum Sharing in 5G wireless networks

### **Empresa**

Iquadrat Informatica S.L

### **Responsable de l'empresa**

Elli Kartsakli

### **Universitat**

Universitat Politècnica de Catalunya

### **Director/a de tesi**

Christos Verikoukis Verikoukis

### **Treballador/a de l'empresa i doctorand/a**

Petros Karagiannidis

## BREU DESCRIPCIÓ DEL PROJECTE DE RECERCA

5G technology is currently under study and it defines and optimizes radically-changing architectures and technologies, leading to a wholesale re-thinking of cellular operational principles and architectures, network topologies, transmission technologies and methods to their analysis, design and optimization. According to the 5GPPP recently launched by the EC, 5G systems need to be capable of providing 1000 times higher capacity and a 90% reduction in energy consumption compared to today standards, in order to cope with the impressive increase of mobile data traffic and to reduce the ever increasing carbon emission footprint of mobile communications. There is also the possibility that 5G networks will enable digital sensing, communication and processing capabilities to be ubiquitously embedded into everyday objects, turning them into the Internet of Things (IoT) or Machine-to-Machine (M2M) systems.

The aim of the proposed research work is to exploit promising technologies, such as “multi-tenant networks”, “multi-tier user association”, “programmable protocols”, “Device-to-Device connectivity”, “network virtualization”, “resource and infrastructure sharing” and “edge-cloud capabilities” to provide new networking topologies in the context of the 5G paradigm. In particular, the specific objectives include:

- Investigation of architectures and mechanisms for efficient resource and spectrum sharing in dense 5G networks;



Generalitat de Catalunya  
Departament d'Empresa i Coneixement  
**Secretaria d'Universitats i Recerca**



Agència  
de Gestió  
d'Ajuts  
Universitaris  
i de Recerca



## EL PLA DE DOCTORATS INDUSTRIALS

- Investigation of multi-tenancy solutions considering both communication and edge-cloud techniques to improve the network utilization and capacity and support a higher amount of tenants;
- Investigation of novel congestion control mechanisms to handle traffic peaks in the networks and provide efficient network utilization

The candidate must have experience in wireless networking, specifically in network protocols. Applicants should also have a solid background in some of the following fields: wireless networking, game theory, stochastic processes, stochastic geometry etc. Knowledge on simulation environments such as MATLAB and C/C++ is required. Fluency in English (spoken and written), proactive communication skills and problem solving as part of a team are also essential characteristics for this position.