

# Communication framework for the electric vehicle: from the Battery Management System BMS to the grid



**NICOLAS BAUDIN**  
INTERNSHIPS IN FRANCE INITIATIVE

IMT Atlantique

<b>Name of the hosting institution in France</b>	IMT Atlantique
<b>Name of the host laboratory / research team</b>	IRISA / OCIF
<b>Address</b>	2, rue de la chataigneraie 35576 Cesson Sévigné
<b>Web site</b>	<a href="https://www.irisa.fr/fr/equipes/ocif">https://www.irisa.fr/fr/equipes/ocif</a>
<b>Name of the supervisor</b>	Nicolas Montavont
<b>Function</b>	Professor
<b>Email</b>	nicolas.montavont@imt-atlantique.fr
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## Internship offer

<b>Topic of the internship (title)</b>	Communication framework for the electric vehicle: from the Battery Management System BMS to the grid		
<b>Proposed dates of the internship</b>	<b>Start:</b> 2020-09-01	<b>End:</b> 2021-02-26	
<b>Scientific and academic objectives of the internship (detailed description of the internship content, work expected from the intern and expected outcomes):</b>	<p>This project aims at deploying a wireless environment for the electric vehicle in order to address the challenges of Battery Management System (BMS), the charging process (ISO 15118) and the interactions between the car and the grid. The development of electric vehicle is promising and contributes to the deep change of the mobility of persons. Electric vehicles however bring new challenges, the main one being the autonomy of the car. The battery technology, the charging system and the fluctuation of the energy availability require control functions (ie, balancing the load, charge management, reliability, security, etc.). These functions require a stable network that today is provided by a wired network. In this project, we propose to set up a wireless network to implement those functions. We will study quality of service at the MAC layer to provide different class of services, experiencing different delays and reliability. We will also study the performance of this network in a real environment, both on our local platform (an Open Source Vehicle), and in a real commercial car. The technology identified for this work is IEEE 802.15.4 with TSCH, RPL, WiFi (in its various versions), ISO 15118</p>		
<b>Name of industrial partner</b>	Renault		
<b>Role of the industrial partner in the internship project</b>	We are working together with the industrial partner (Renault). We currently have one common project with a PhD student working with us. In addition to developing together, Renault is also providing hardware and battery case for this internship.		
<b>Main contact at the French industrial partner</b>	Samuel Crégut		
<b>Email</b>	samuel.cregut@renault.com		
<b>Name of the Australian partner institution</b>	University of Technology Sydney		
<b>Name of lab/department/team involved in the Collaboration at the Australian partner institution</b>	School of Electrical and Data Engineering, FEIT		
<b>Main contact in the Australian partner institution</b>	Ren Ping Liu		
<b>Function</b>	Director of Cybersecurity Lab & Head of Discipline, Network and Cybersecurity		
<b>Email</b>	RenPing.Liu@uts.edu.au		
<b>Outside of this ongoing collaboration, will applications coming from students of other eligible Australian universities be considered by the hosting institution in France?</b>	Yes		

## Expected profile of applicant

<b>Level of study</b>	Undergraduate, postgraduate or Master
<b>Discipline</b>	Telecommunication, Networking, Electrical Engineering, Electronic
<b>Required qualities, knowledge and skills</b>	Self-motivated open-mind Skills: TCP/IP network principle, electronics, programming