Introductory lecture on Communication for ITS

9.5.2016, зала 326, 15-19 и 10.5.2016 зала 325 15-19

Car industry is evolving in a way to provide smarter and safer cars. Nowadays, embedded electronics provide users with a safer and more enjoyable traveling experience than ever before. An inescapable step in this evolution is the connection of vehicles to the Internet, which opens the way to an infinite number of enhancements. Basically, services related to Intelligent Transportation Systems (ITS) can be categorized into safety related and infotainment related services. Some of them use Internet-based communications while others rely on car-to-car communications mainly to provide safety-related services.

In this talk it will be explained how vehicles can take advantages from wireless communication technology diversity using IPv6 mobility protocols and standards to provide on-board applications with a full continuous IPv6 connectivity. Consequently, the Internet flexibility could simplify the development of various services (from security to infotainment). The ITS communication architecture designed at ISO and ETSI is described and a focus is made on the support of multiple heterogeneous communication interfaces.

We will also survey car to car communication technologies and how multi-hop communications have been introduced in the architecture for safety (real time) related services. A focus will be made on how security and privacy can be ensured in such vehicular networks.

Public : M1/M2/PhD with basic knowledge on security, and IP-based networking.

8 hours

Advanced seminar on Opportunistic Networking for ITS

11.05.2016 г., зала 501, 09:00-11:00

After a brief review of the work done in standardization bodies and in the academic world, this talk will show how such communication capabilities and architecture could be used for several use cases. It will continue, giving some insights of what a "full-featured" heterogeneous networks and mobility management framework for ITS could/should be.

Few promising future works will be sketched-up. They are related to the way the IP-based architecture may integrate other communication paradigms (DTN, Geo-routing) in order to meet safety-related application requirements or to alleviate constraints (performance, bandwidth, …) on on-road communication infrastructure.

Public : M2/PhD/Researchers with skills on networking, and IP communication architecture

2 hours with questions

Seminar on Innovation for smarter cities

11.05.2016 г., зала 501, 11:00-13:00

The market of Smart Cities is still young but it is already a huge market which attract number of companies and researchers. It also multi-fold as the words “smart city” gather multiple meanings. In this talk we will give an overview of the multiple reality that could fit in smart city. Will see the fundamental differences between the top-down and the bottom-up approches in this context and how local authorities begin to understand the necessity to involve citizen in a bottom-up approches from the very beginning of the project. Any way they still have the essential role to establish the condition of the “spontaneous” participation of a variety of people.

To create favourable conditions local authorities have a lot of lever in the ICT domain : Living Labs, Open Data, and LabFab. What is a LabFab? How it can be used in a city to involve citizen in the evolution of the city toward a smarter city ? The successful experience of the city of Rennes will be described and we will exchange on the conditions to make such a Lab Fab useful for student in the university context. And how it could become a tools to establish strong relationship between student population and the inhabitants of the city.

Public : M1/M2/PhD/Teachers (everybody) interested

2 hours

Seminar on Cooperative autonomous vehicle

12.05.2016 г., зала 514, 16:00-18:00

With a lot of public announcement from automaker, tear-one manufacturers, and even new comers in the car industry, autonomous vehicle are now in the sunlight. But far before Google, a lot of works has been done in recent years in automotive industry as well as in academic research centers. However, due to the lack of a definition of what is an autonomous vehicle it remains still difficult to see how these vehicle will interact with their environment (eg. road, smart city, houses, grid, …). Such autonomous vehicle could strongly impact the organisation of the transportation in our cities.

From augmented perception to fully cooperative unmanned vehicle, the autonomie cover various realities in terms of interaction the vehicle rely on. The extended perception rely on communication with the vehicle and roadside equipments in the surrounding. This help the driving system to build and maintain an accurate view of the environment. But at this first stage the vehicle only use its own perception to make its decisions. At a second stage, it will take benefits of car to car communications to have a better view of its environment.

The cooperative autonomy does not try to reproduce the human behavior, it strongly rely on communication between vehicles and/or with the infrastructure to make decision and to acquire information on the environment. Part of the decision could be centralized (almost everything for an automatic metro) or coordinated by a roadside component. The decision making could even be fully distributed but this put high constraints on the communications.

It is interesting to see behind the scene what are the scientific advances and remaining challenges will have to face to have fully cooperative autonomous vehicle.

Public : everybody, à large part will present the context and the main trends

2 hours