Personal Information

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Studies

Title of degree	Study Period	Location
Higher Education Diploma in Telecommunications specialized in Telematics	09/2009–07/2014	E.T.S.I.T University of Valladolid
Master of Telecommunication Engineer	09/2014–06/2016	E.T.S.I.T University of Valladolid

Diploma Thesis

Company	Title	Abstract
E.T.S.I.T University of Valladolid	Degree project: System M2M for telemetry and geolocation of vehicles with Raspberry PI	A "Machine to Machine" (M2M) system was fully developed using a Raspberry Pi as a central embedded device. The device picks up location information from GPS, collects telemetry and diagnostic data from CAN bus of the vehicle and sends it through GPRS cellular network to a remote server. Additionally, a website server was programmed where users can access the collected data. To sum up, users can track the vehicle in the Internet or by using SMS.
E.T.S.I.T University of Valladolid - Telemotive AG, Böblingen (Germany)	Master Final Project: "802.11p standard and V2X applications on commercial Wi-Fi cards"	Project focused on the use of the wireless 802.11p standard for its use in a vehicle Datalogger. The project was developed on Linux environment using conventional Wi-Fi wireless cards, and tested so that it could be used in a professional BluePirat datalogger from Telemotive A.G. The main difference between this project and other commercial projects is its approach to implement the access layer using a conventional and low cost Wi-Fi wireless card, whereas most of the commercial projects adopt a proprietary approach. Finally, the project included all the necessary tests to ensure that it could be commercialize. Some of the tests were carried out with a real ITS device provided by the Car2Road consortium to check the interoperability of this project with a real infrastructure.

Professional Experience

Company/ University	Location	Period	Description
Telemotive AG	Böblingen (Germany)	01/09/2016–31/12/2016	▪ Final Project: 802.11p standard and V2X applications on commercial Wi-Fi cards. ▪ Internship, Software development: Deployment, data logging, testing and validation, especially for an industrial commercial product, the BluePiraT2. ▪ Focus: Linux, drivers, Wireshark, 802.11p, C/C++, sockets, TCP/IP. ▪ Sector: Automotive, V2X, connected car.

Languages

Language	Understanding	Speaking	Reading	Writing	Certificates
Spanish	Mother tongue	Mother tongue	Mother tongue	Mother tongue	
English	B2	B2	B2	B2	
German	A2	A2	A2	A2	

Extra-Curricular Activities

Date	Activitiy	Location
02/2014–07/2014	**Aula Mercedes-Benz**: Telematics systems in vehicles with CANoe as tool and CAPL as programming language	E.T.S.I.T University of Valladolid
2015	**Nacional competition**: "Life GreenTIC 2015" competition. The reduction of the carbon trace was the aim of the context in which I won with Blueberry Car Connect	E.T.S.I.T University of Valladolid
2014 - 2015	**International competition**: Formula Student competition - Junior software engineer.	E.T.S.I.T University of Valladolid
2015 - 2016	**International competition**: Formula Student competition - Software Team Leader	E.T.S.I.T University of Valladolid

System M2M for telemetry and geolocation of vehicles with Raspberry PI

The following picture shows how the developed system works. The M2M device can set the accurate time and location for vehicle telemetry, and shares the information in the Internet. User can know the status of its vehicle at any time using a graphical user interface.

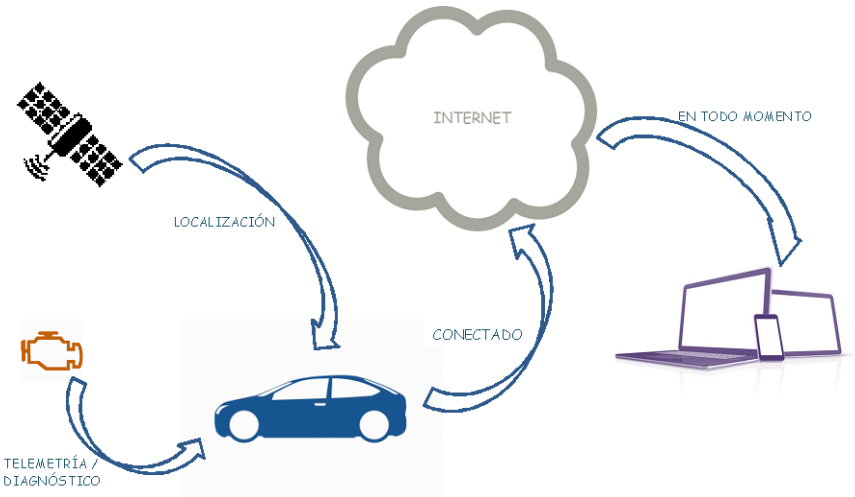

Figure 1. Infrastructure

The Raspberry Pi was chosen as the embedded device, because it meets with all the requirements and has a lower price. Moreover, it supports every communication needed, such as Bluetooth, Wi-Fi, GSM, GPRS and GPS.

Figure 2. Embedded device

The following picture shows how the data was represented in a user-friendly interface sharing statistics, which also check any vehicle malfunction instantaneously. In the example shown, shows the speed and rpm, as well as an estimation of the drive quality, in order to promote the eco-driving. Moreover, the system provides the vehicle failures, and a specific trouble definition to the user.

Figure 3. Vehicle status

Additionally, the localization information is shown in a map, as it can be seen in the following picture. A SMS notification feature was provided in order to know at any time where the car is placed

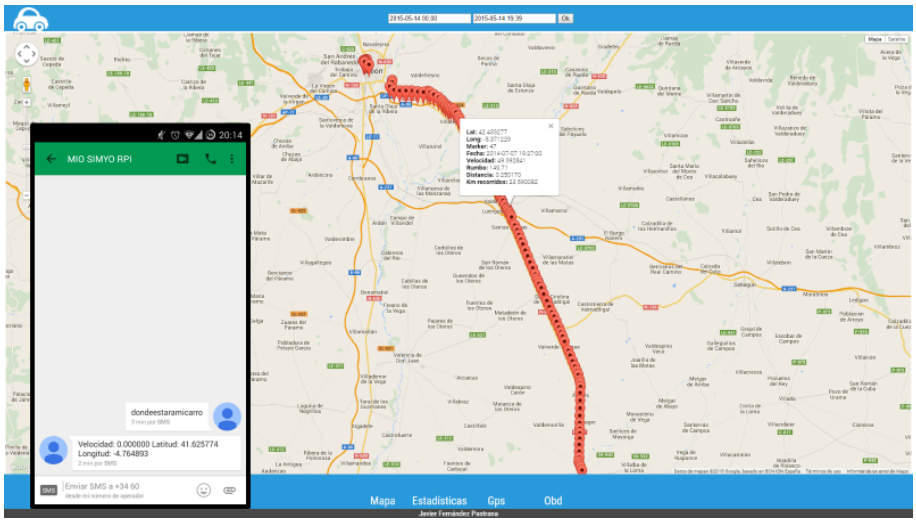

Figure 4. Localisation information

802.11p standard and V2X applications on commercial Wi-Fi cards

The main target of this project was to deploy the 802.11p standard using commercial Wi-Fi cards. Although the project was mainly oriented to European Union standards, nonetheless US and EU standards share the physical layer. As it can be shown in the following picture, 802.11p implements part of the physical layer, as 3G, GSNN or sensors.

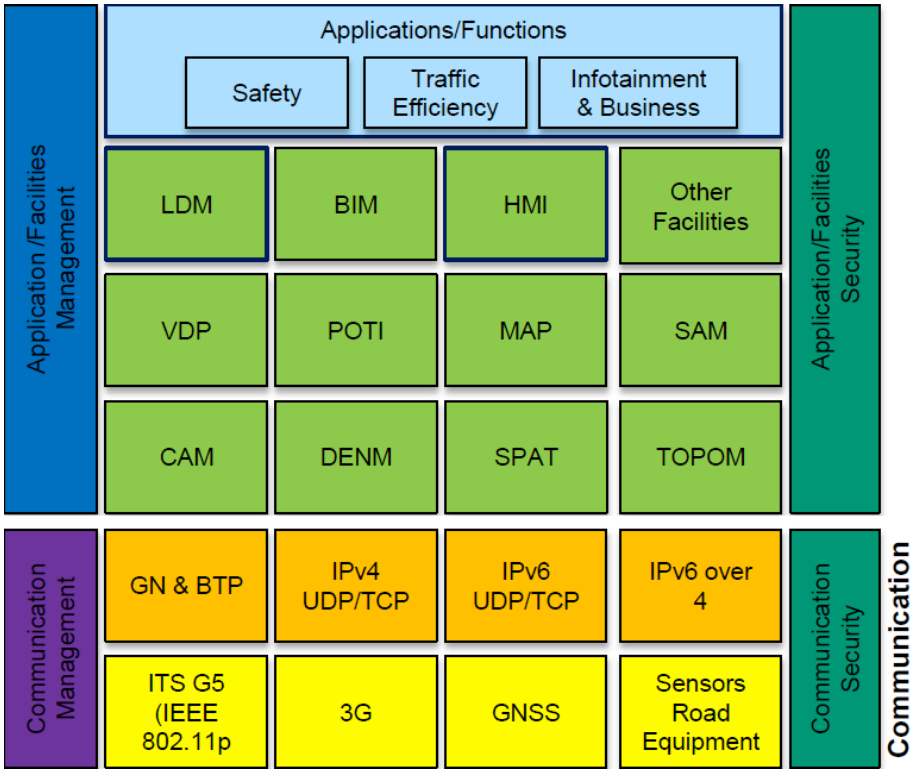

Figure 5. ETSI ITS G5 stack

Upper layers of the ITS stack were also implemented to test and validate the correct behaviour of the system. For the 802.11p deployment a BluePiraT2 from Telemotive AG was used. Moreover, to test the upper layers of the standard, a Road Side Unit designed by Car2Road was also used. The project could prove that it is possible to integrate this protocol in the commercial product BluePiraT2, allowing it to log in the future this type of communications

Figure 6. BluePiraT2

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