Import – Summary

High performance accelerated applications, which function at today's FPGAs, are an increasing power in sectors that range from telecommunications and image processing to biomedical and scientific computing. The present document imports us in new dynamic techniques which, in combination with the use of ImpulseC language, offer us the creation of such applications, their control and the automatic production of hardware code, which of course is compatible with any FPGA platform.

The design of such hardware/ software systems which are developed with ImpulseC bridge the chronic gap between the growth of "conventional" software and the methods and philosophies of digital designs in FPGAs. The software programmers will learn to examine FPGAs as "a programming calculating source", achieving their apparent performance, because of their capability to execute a part of their code on hardware. On the other side, hardware programmers will dominate in techniques which perfectly complete their existing experience in HDL languages, allowing them to search new alternative design solutions and to create new system prototypes in a shorter time. Both of these teams will learn how to configure C language so that they can support the hardware/ software co-design and improve their syntax, their repair methods and their control.

More concretely, at this particular work the aim was the study, the design and the high level simulation of a part of the IEEE 802.11 wireless access protocol. Our prospective was the development of the protocol's transmission system (transmitter). The design of this particular subsystem is done using the ImpulseC language, which allows the automatic production of hardware code using FPGAs.

The methodology that we followed for the implementation of this project is the following:

- Search and pumping of required information from existing researches and publications.

- Installation and configuration of essential tools, as:

  - the environment of ImpulseC.

  - the environment of Xilinx ISE Ver. 11.

- Analysis and study of the already existing ISE module.

- Study of the IEEE 802.11 protocol's operation.

- Design of the IEEE 802.11 protocol's transmission system with the ImpulseC language.

- Implementation of the IEEE 802.11 protocol's transmission system in the Xilinx Spartan- 3A board.