During semester 4, between January and April 2017, we, Simon METAYER & Alexis BIZON, made a technical IT project in the GEII (Genie Electrique et Informatique Industriel) department of Nantes's IUT in France. We were under the supervision of Mr Patrice GRAZIOTIN, IUT's teacher.

The aim of the project was to create from scratch a guitar tuner. It might seem easy, but it required a big software development with hard mathematics inside and a complex hardware structure to rightly acquire the guitar signal. The first task was to choose a microprocessor to process the signal quickly enough. Then, we studied the music theory, indeed, notes can be calculated with mathematics formulas from the main frequency of "pure" signal; for example, just a single note of an instrument like a guitar. After that, we programmed a first software to analyse and tune a frequency. Then we developed and manufacture a printed circuit that can be plug to the microprocessor we choose before. This card is able to power supply, from a simple 9-volt battery, the whole circuits. This card can also receive an instrument signal trough a microphone or a connector and process it to receive the right signal form. To finish we programmed a complete software solution wo work for all sounds a human can hear.

This project was challenging but at the same time interesting because of a strength association of soft and hardware at the same time. This long a complex project was for us an opportunity to improve our project management skills. In term of progress our project works but is not completely done; it misses a few hours to adjust parameters in our program to have a truthful instrument tuner solution.

Key words:

Accordeur de guitare Guitar tuner

Traitement du signal Signal processing

Micro-processeur Microprocessor

Frequence Frequency

logiciel Software

materiel Hardware

Source d’alimentation Power supply