Ultrasonic camera acquisition system

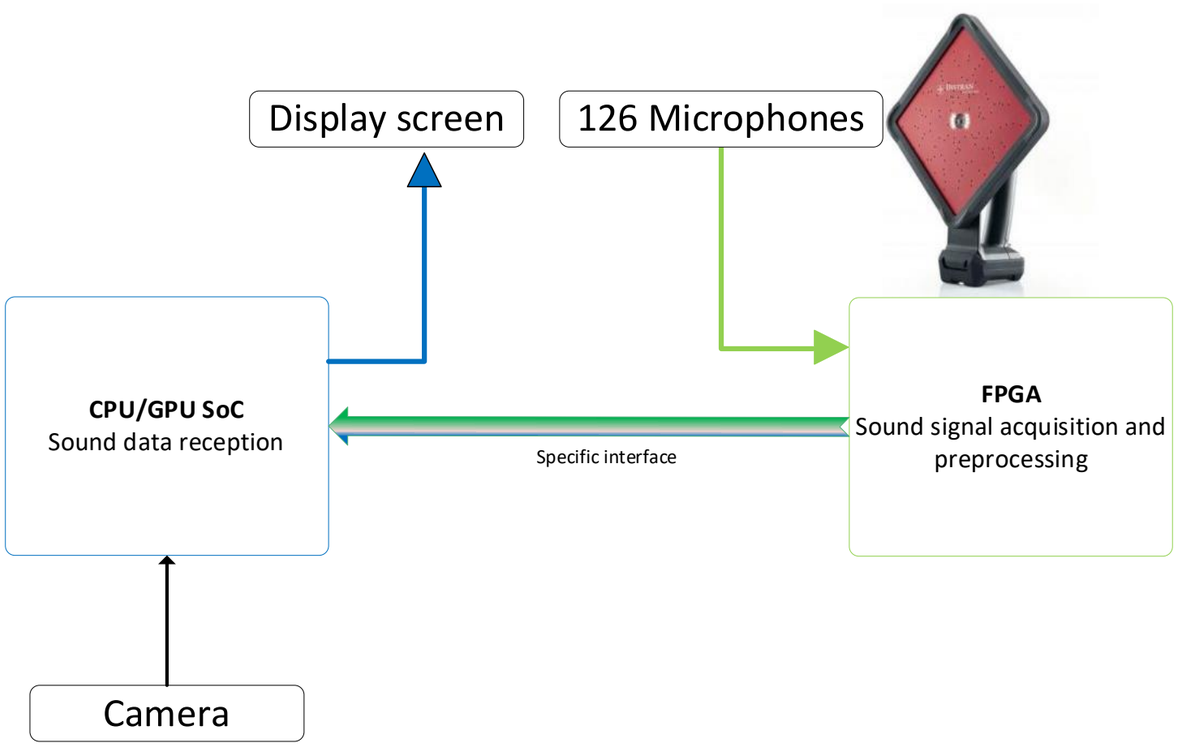
Autors : AMOIN – DAVID – FERRO – PIROLA

CONTEXT AND GOAL

Distran is a startup founded in 2013. It develops and markets ultrasonic camera : each of the 126 microphones of the camera receives sound with an offset of a fraction of a millisecond. Algorithms in the camera are able to rebuild the position of the ultrasound source. This embedded camera is used to find more efficiently and easily gas leaks.

The goal of this project is to migrate the system to a new architecture to improve performances and use new technologies . This new architecture will consist of two electronic cards : an FPGA and a CPU/GPU SoC.

METHODS AND DEVELOPMENTS



This project is composed of an EIS part and an IRC part. Indeed, it as been divided into two parts :

- At first, the design does the acquisition of the microphones, filters and sends data with the FPGA.
- Then, it receives the data on the SoC, does some process and merges the two video streams.

We had weekly meeting with Distran's team. In each meeting, we did an update on the progress of the project, we discussed on the technical issues and determined the goals for the next week.

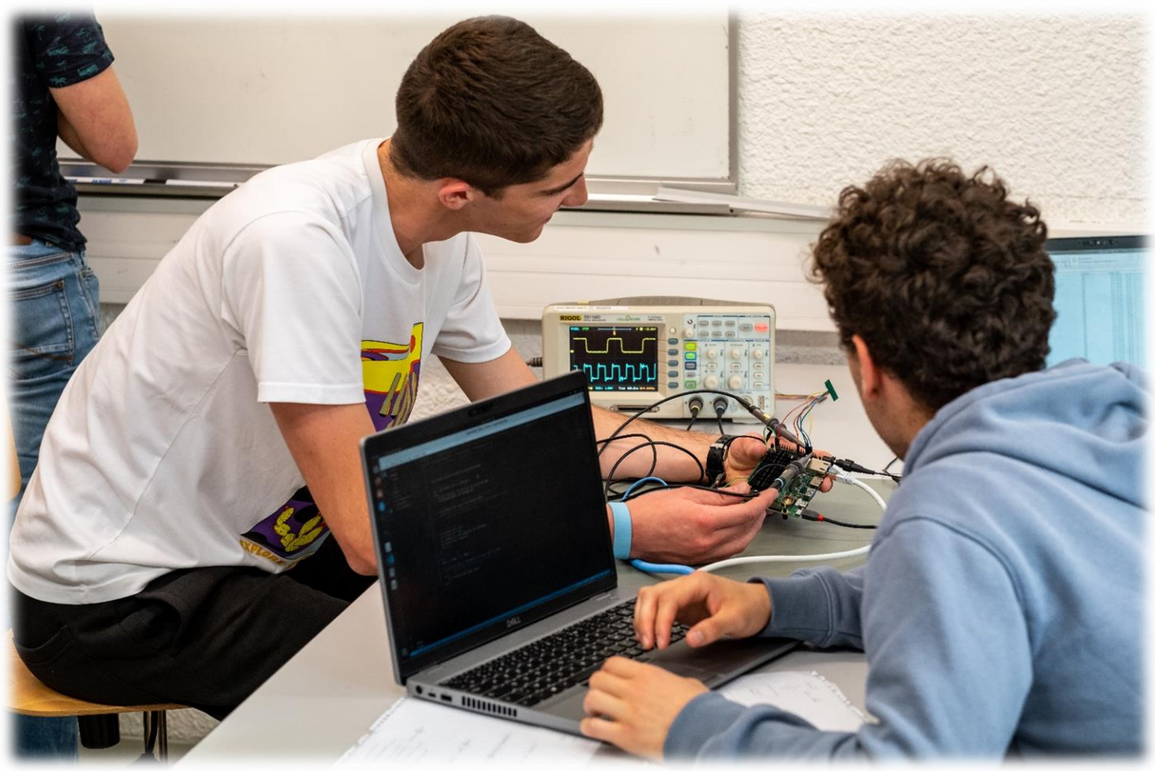
RESULTS AND CONCLUSION

On the FPGA part :

- The FPGA is able to receive the signal of 128 microphones.
- It applies a filter on this data.
- Finally it sends audio stream to the CPU/GPU SoC.

On the CPU/GPU SoC part :

- The server is functional and receives all data without any loss (principal goal).
- All the data is made available for the GPU and a first process is apply.



KEYWORDS : FPGA **design – UDP transfer – Real time software – Embedded System**