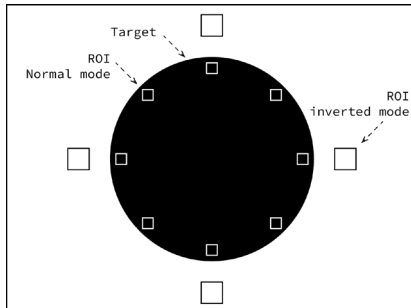


## Video processing on SoC



Graduate

Fracheboud Loïc



### Objectives

The goal of this project was to perform real-time video processing tasks on a Zynq SoC with a dedicated development environment embedded in a virtual machine.

### Methods | Experiences | Results

Eye tracking is a wide and emergent technology used in many fields such as medicine or marketing.

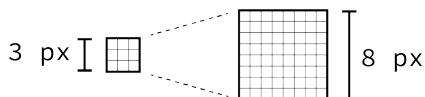
Traditionally, eye tracking technologies are typically based on direction, amplitude and location of the sight.

In this work, the movement was defined by tracking the limit between the white part of an eye (sclera) and the dark part, the iris. Those two elements benefits from the high colour contrast existing between them.

Practically, groups of pixels were defined in a target and their median value was monitored. As soon as this median value changed, a flag was raised to indicate a potential movement.

Difficulties of the project resided in the speed available in the system as all data must be received and processed in the small timeframe imposed by the high-speed camera.

To reach this objective, a real-time video processing was designed and destined to be embedded on a Zynq FPGA. The system has been then tested with several test benches and results showed that its tracking was efficient in several different conditions.



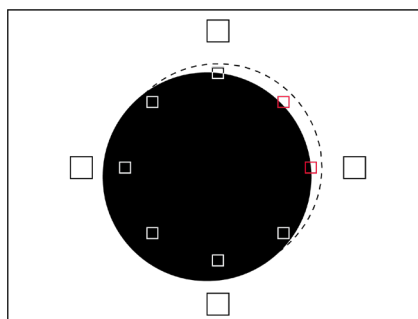
Bachelor's Thesis  
| 2019 |



Degree programme  
*Systems Engineering*

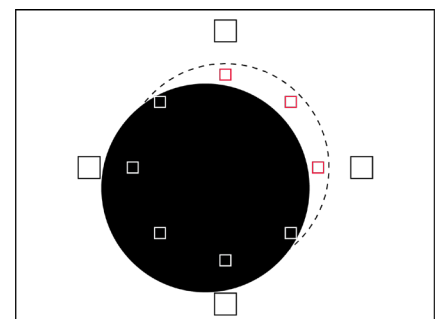
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The eye (schematized as the black dot) can move slightly within a certain tolerance range without trigger a response.

Activated sensor are marked in red.



If the eye moves beyond the tolerance range, a response is triggered and a movement is detected.