

Absolute Local Positioning System

Eurobot 2012



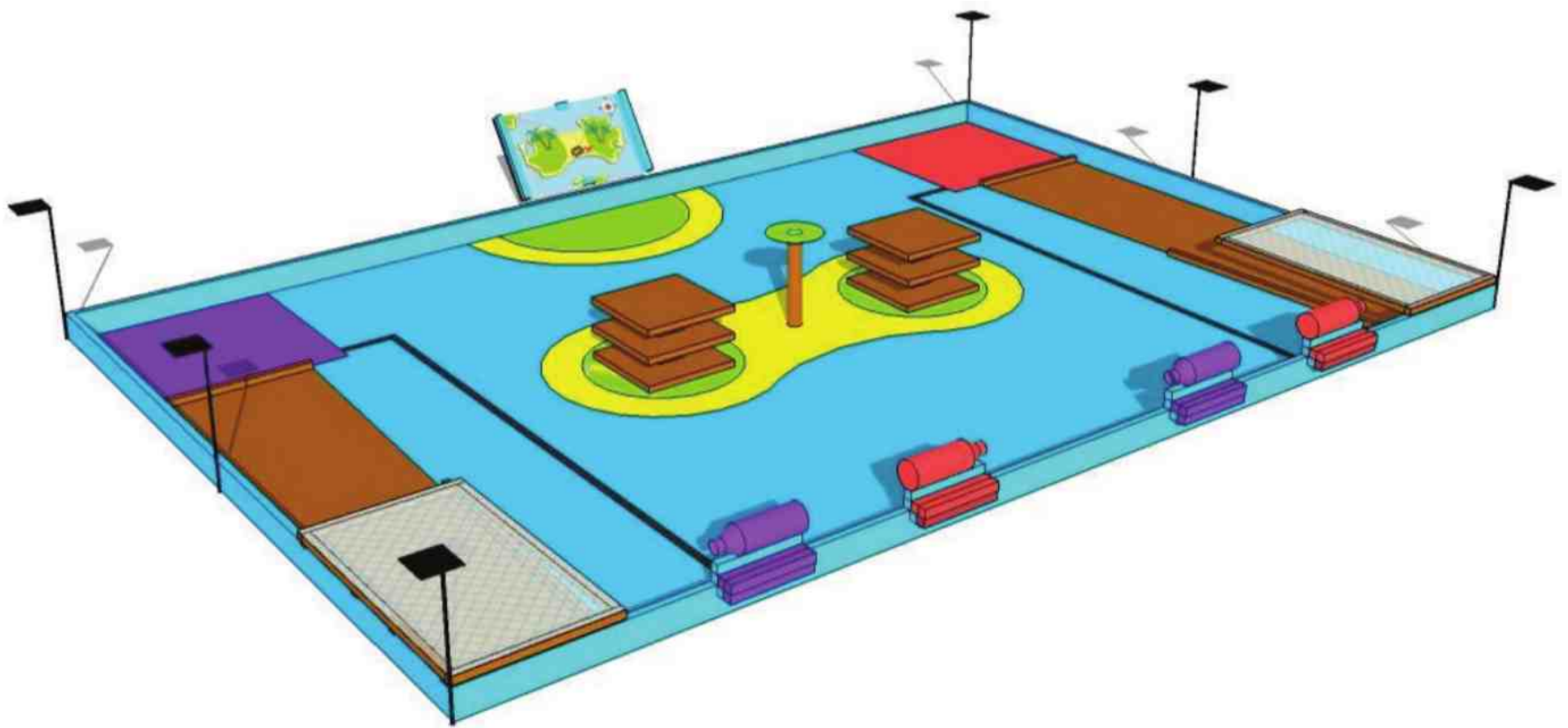
Prof. Michael Ansorge
Prof. Wolfram Luithardt

Michaël
Defferrard

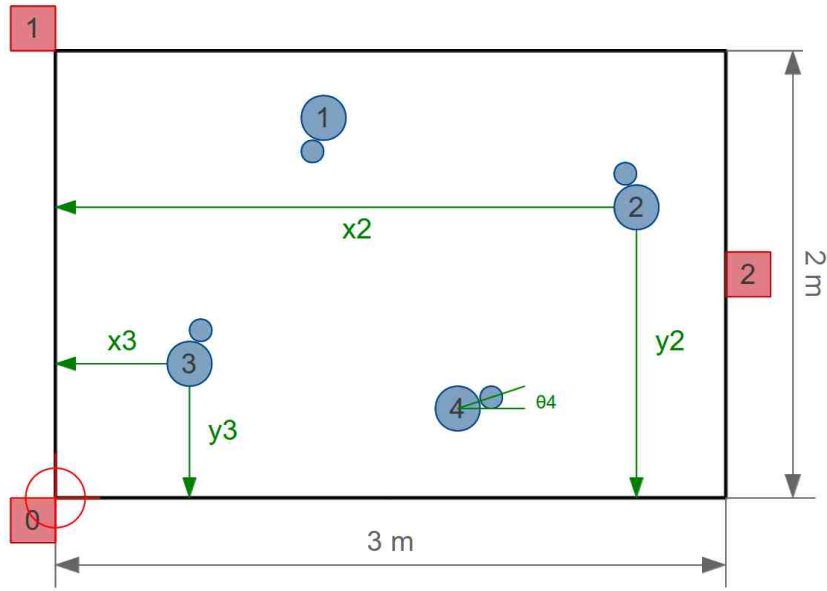
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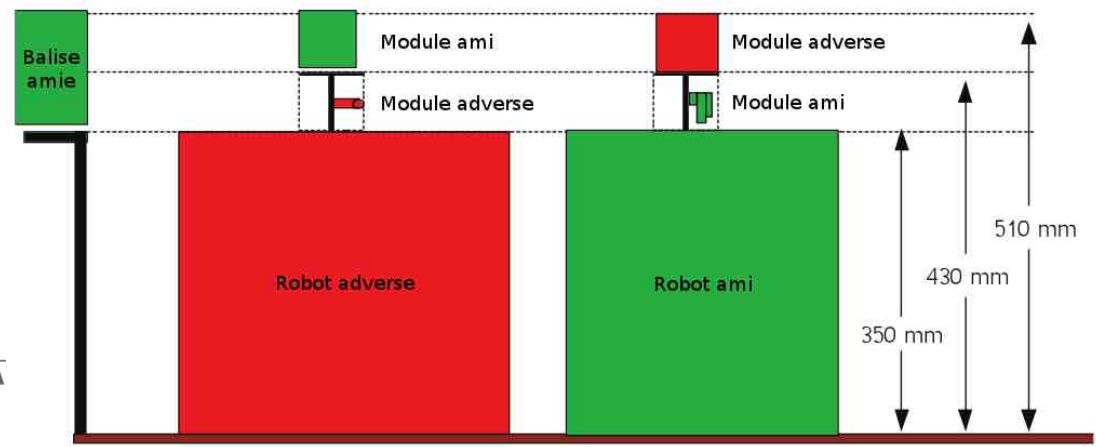
Eurobot 2012



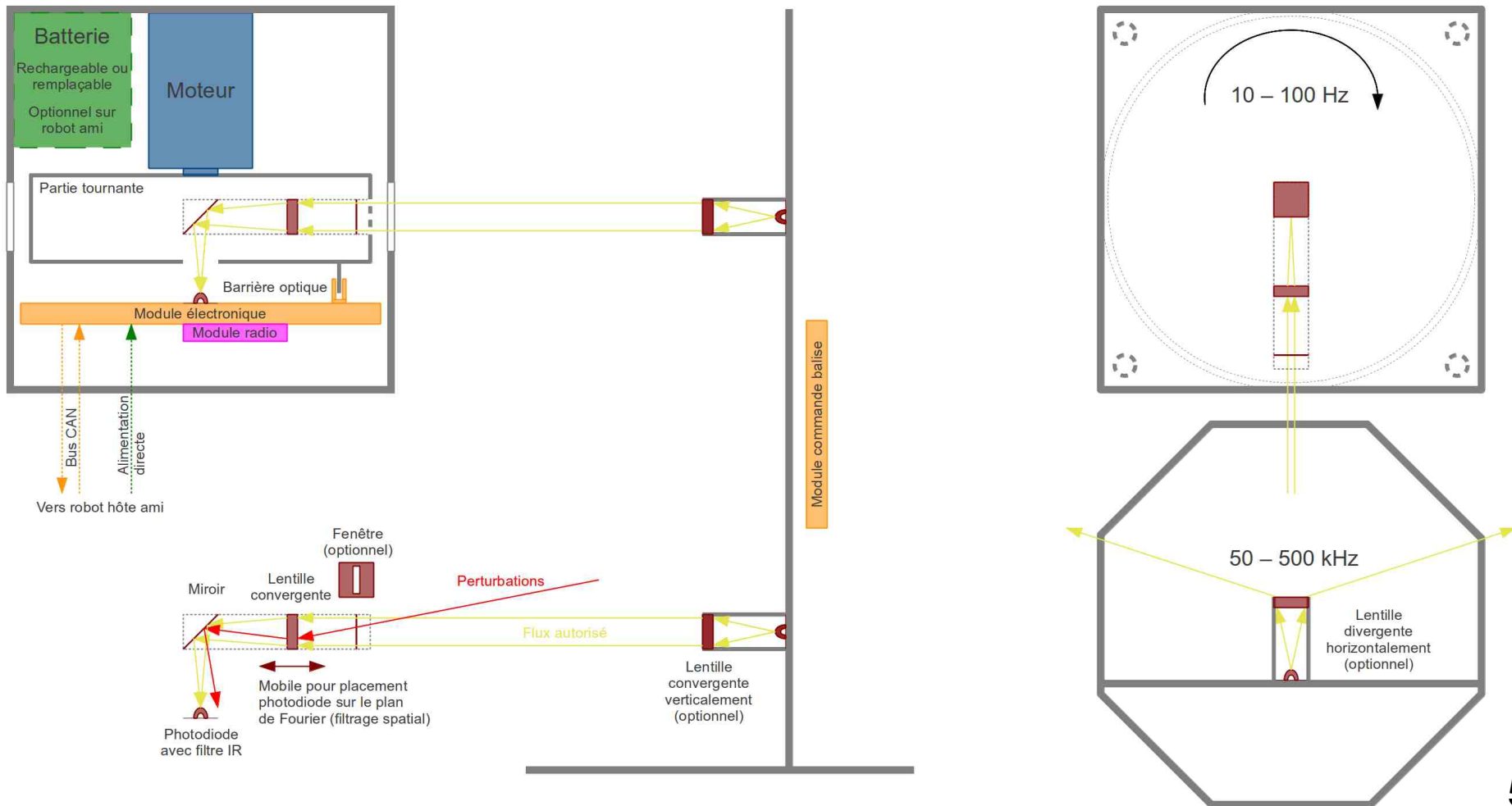
Positionnement



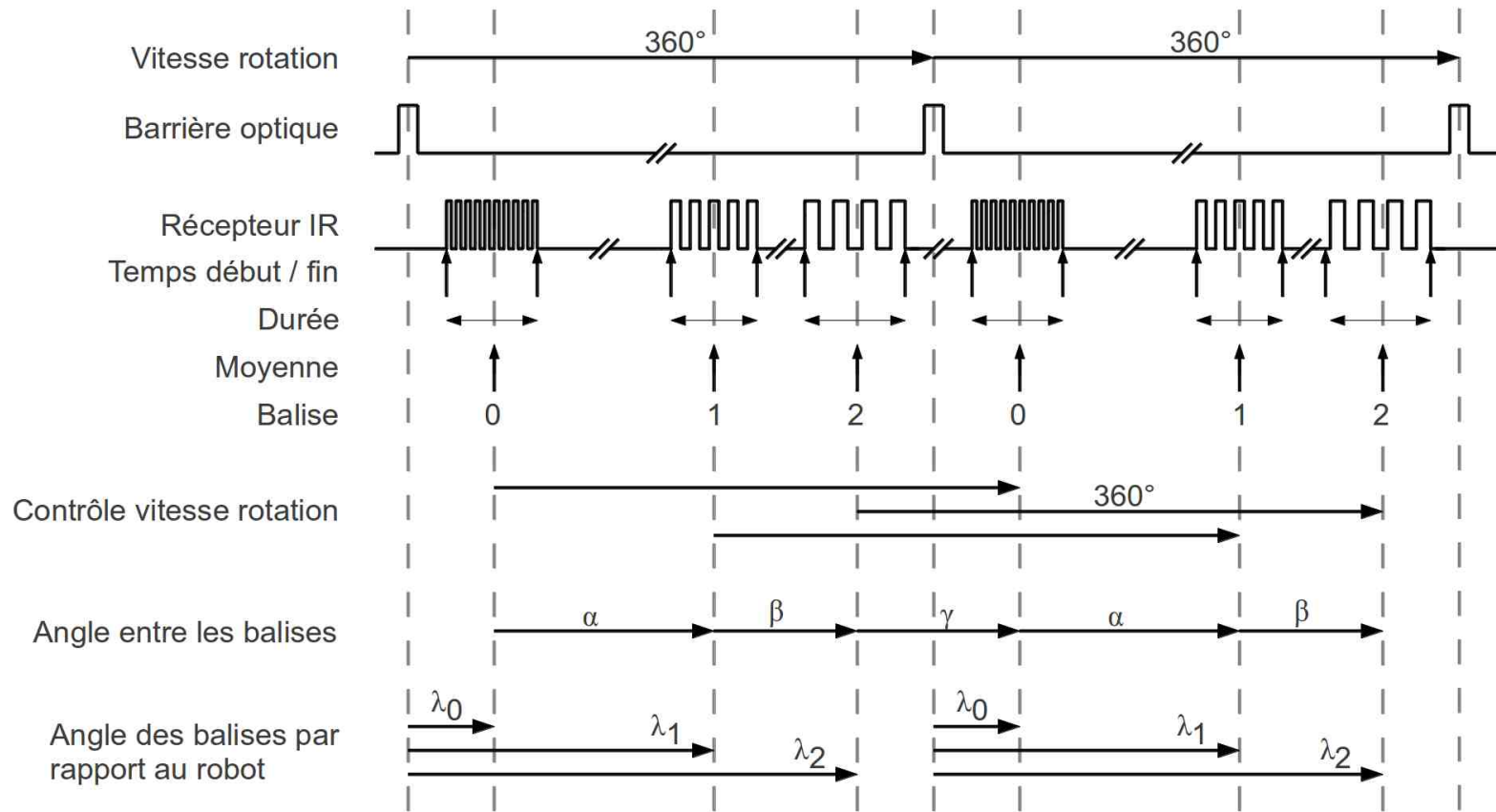
 balise  robot



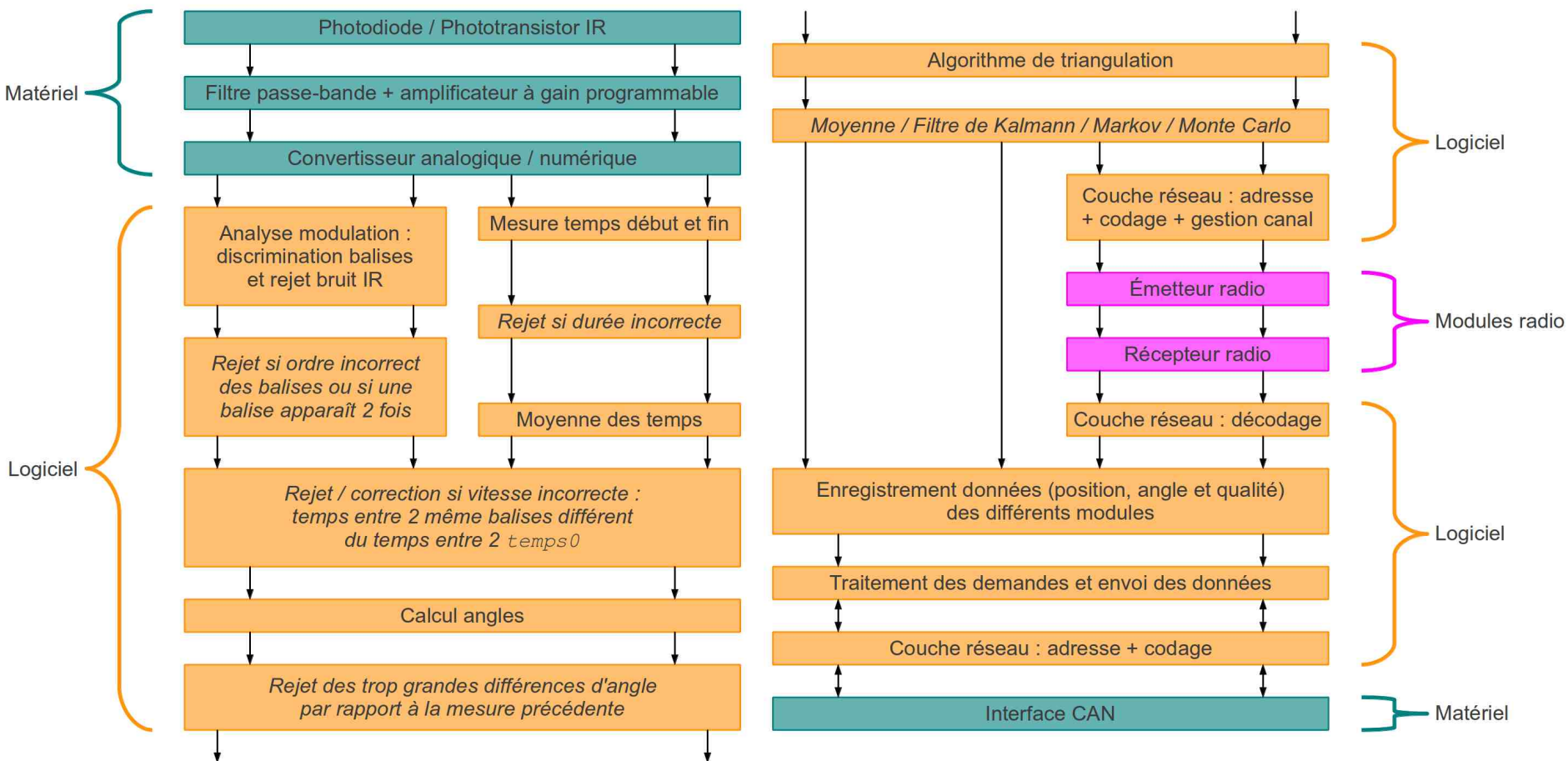
Concept



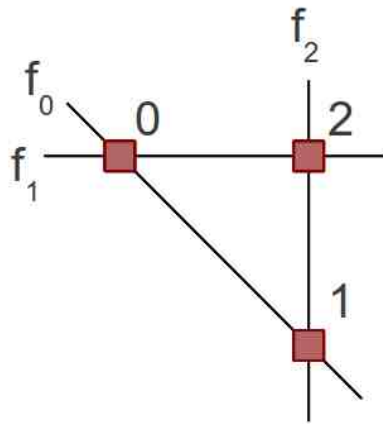
Concept



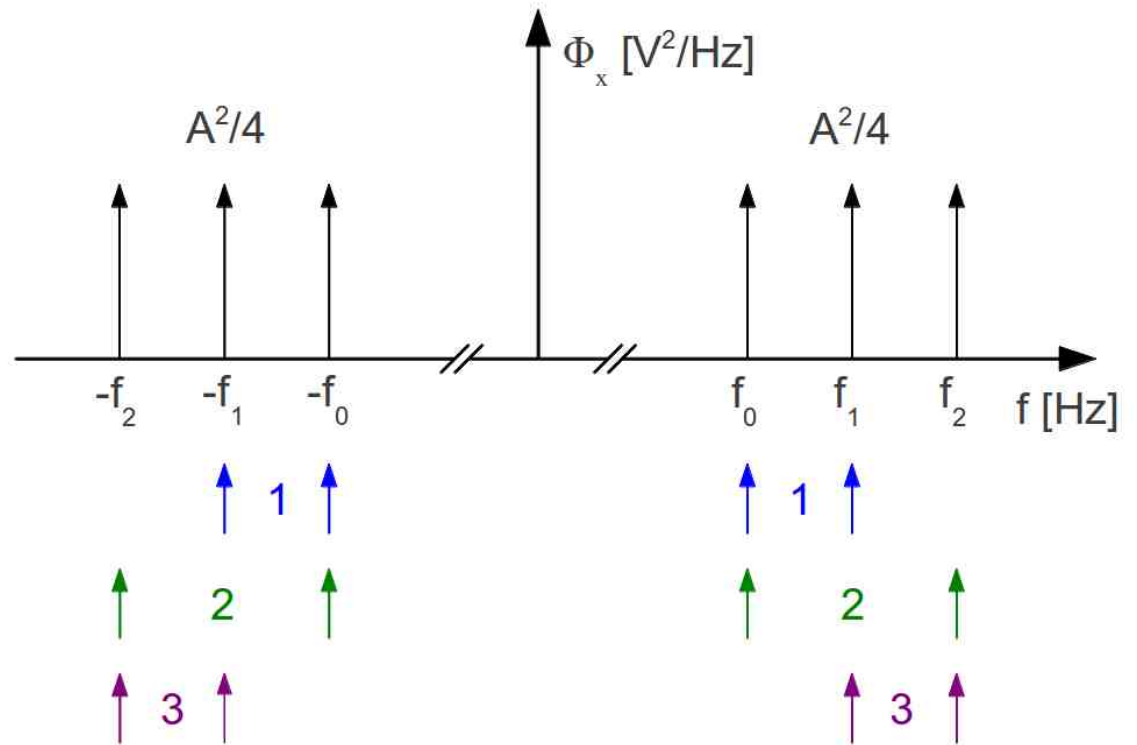
Concept



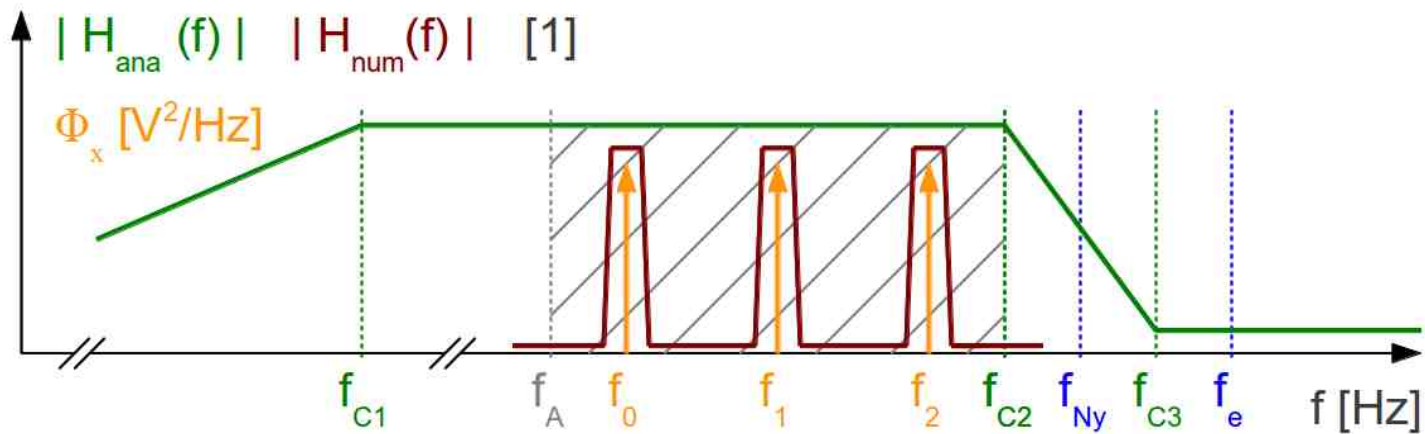
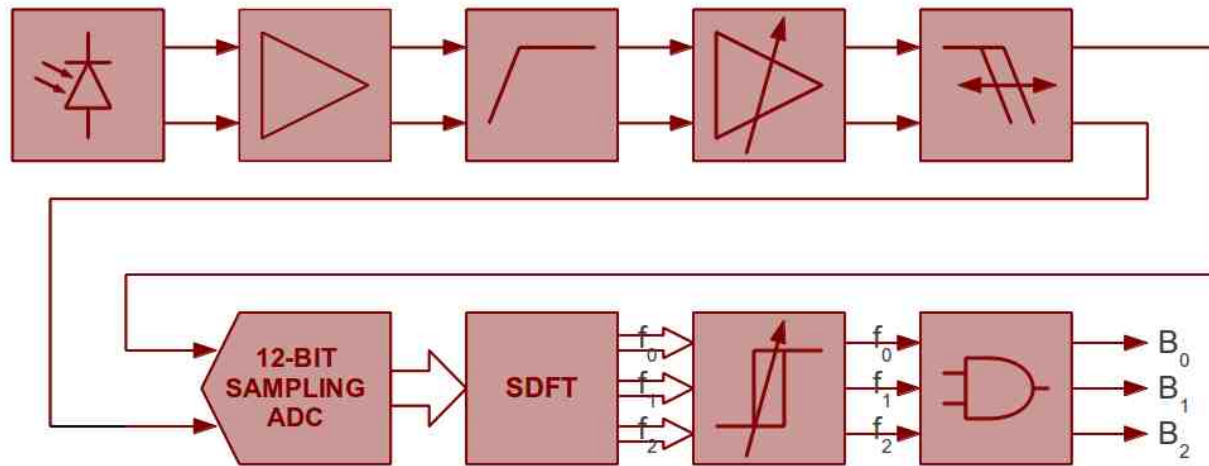
Signaux



DTMF
Dual Tone Frequency Modulation

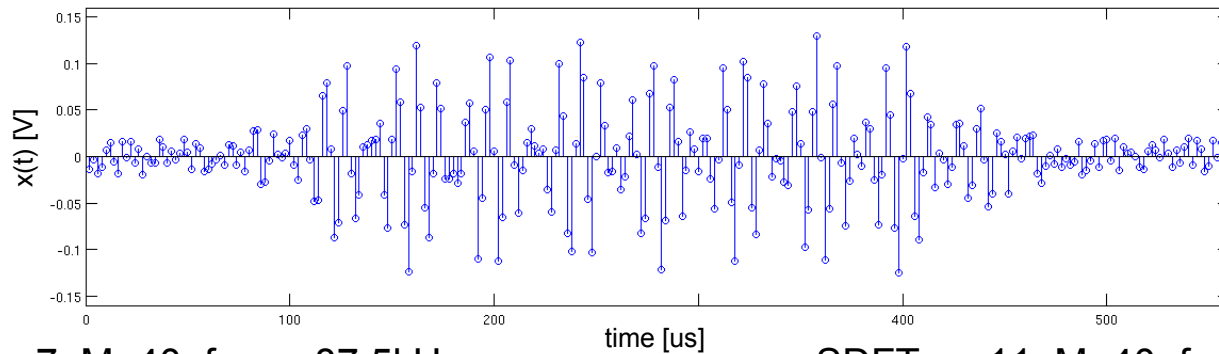


Traitement du signal

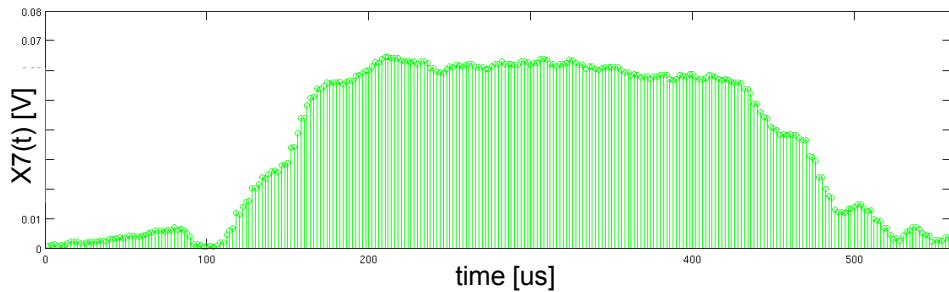


Simulations numériques

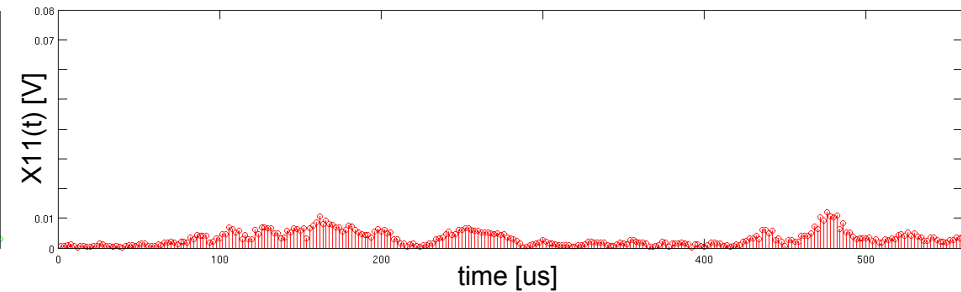
Time plot, $f_e=500\text{kHz}$, $N=280$ samples



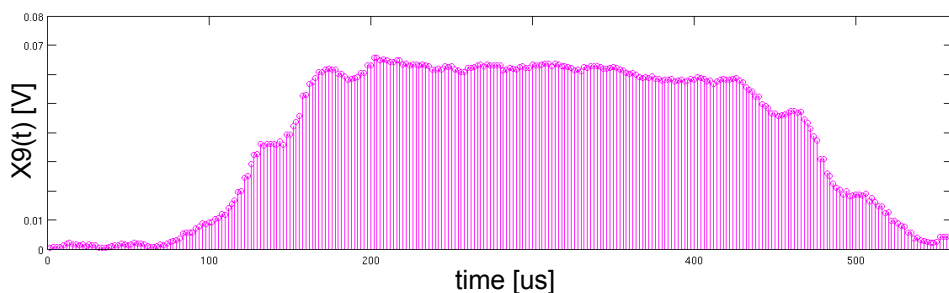
SDFT $m=7$, $M=40$, $f_{mes}=87.5\text{kHz}$



SDFT $m=11$, $M=40$, $f_{mes}=137.5\text{kHz}$



SDFT $m=9$, $M=40$, $f_{mes}=112.5\text{kHz}$

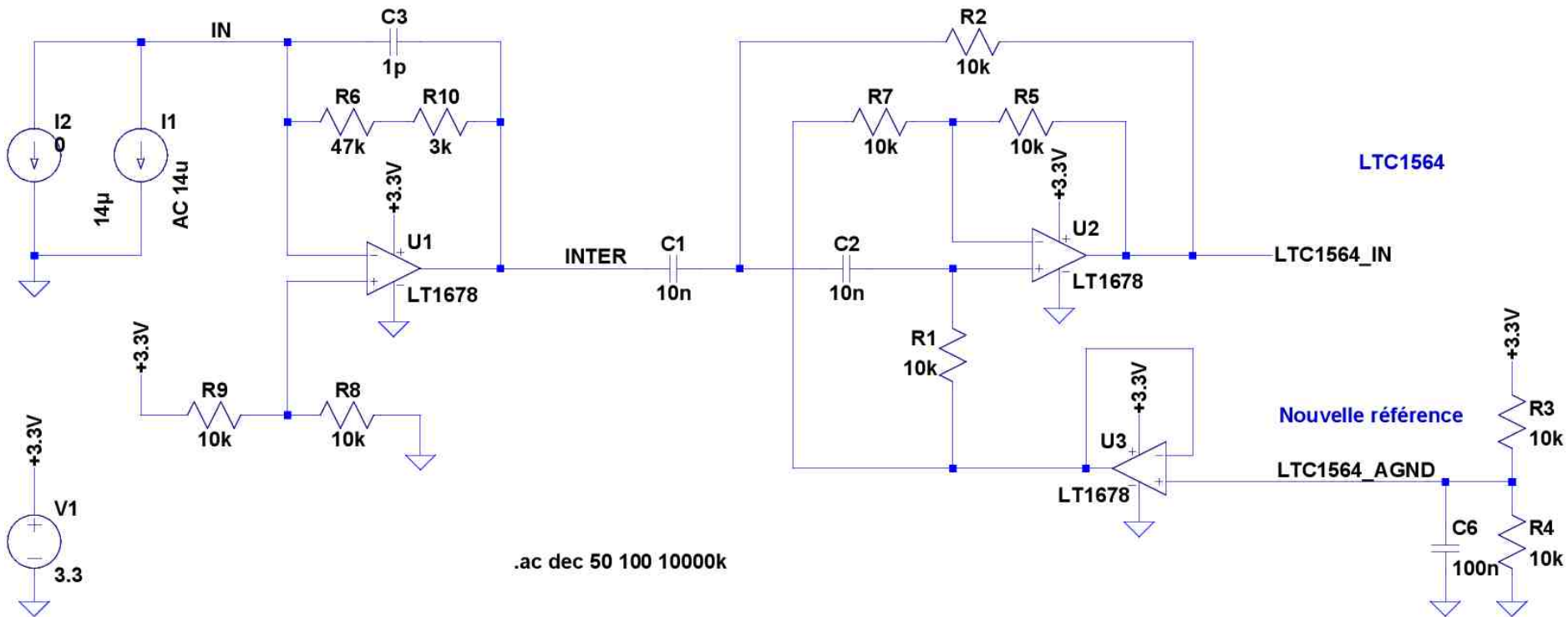


Traitement analogique

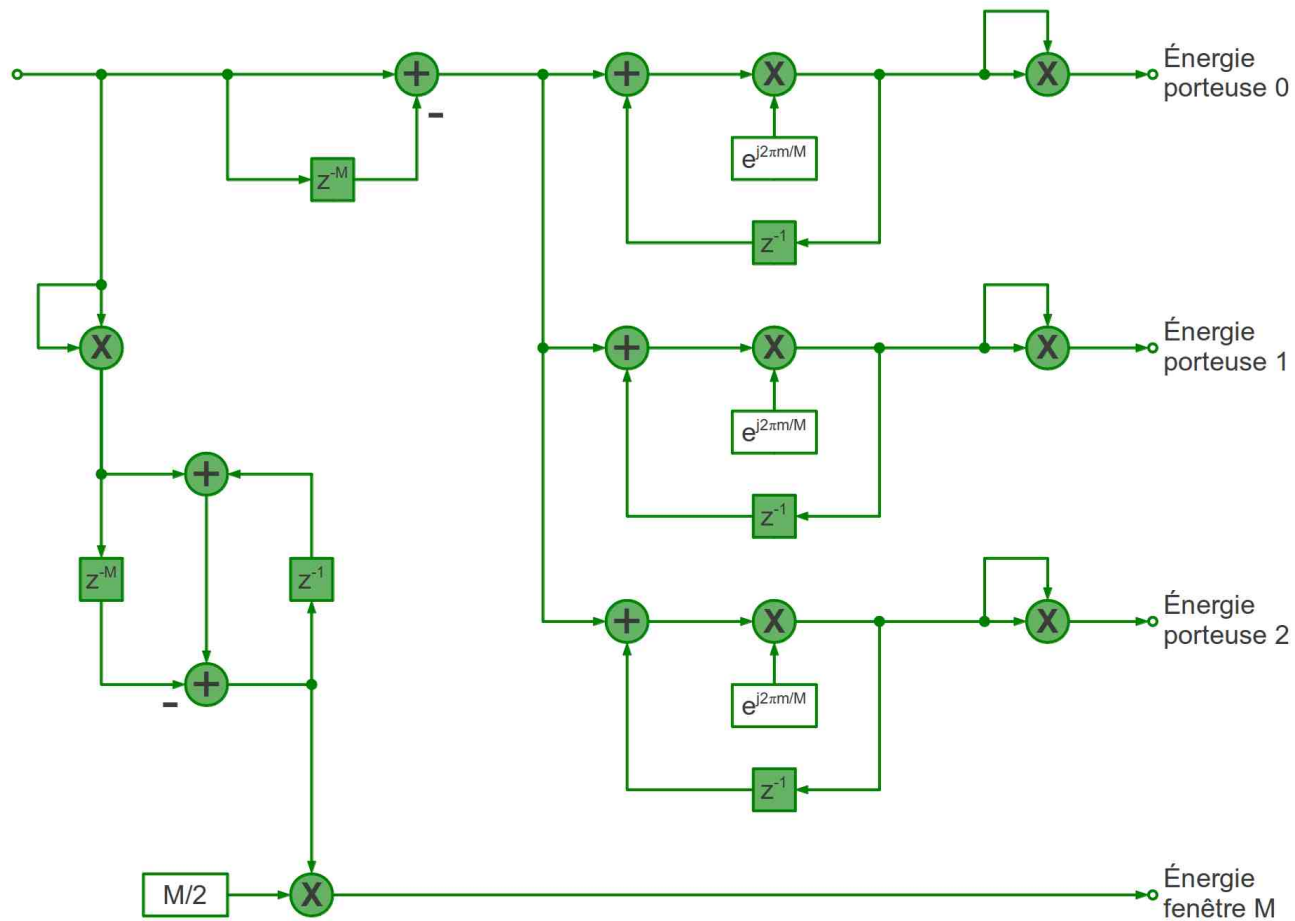
Photodiode IR
VR = 1.65 V

Amplificateur à transconductance
G = 50 kohm

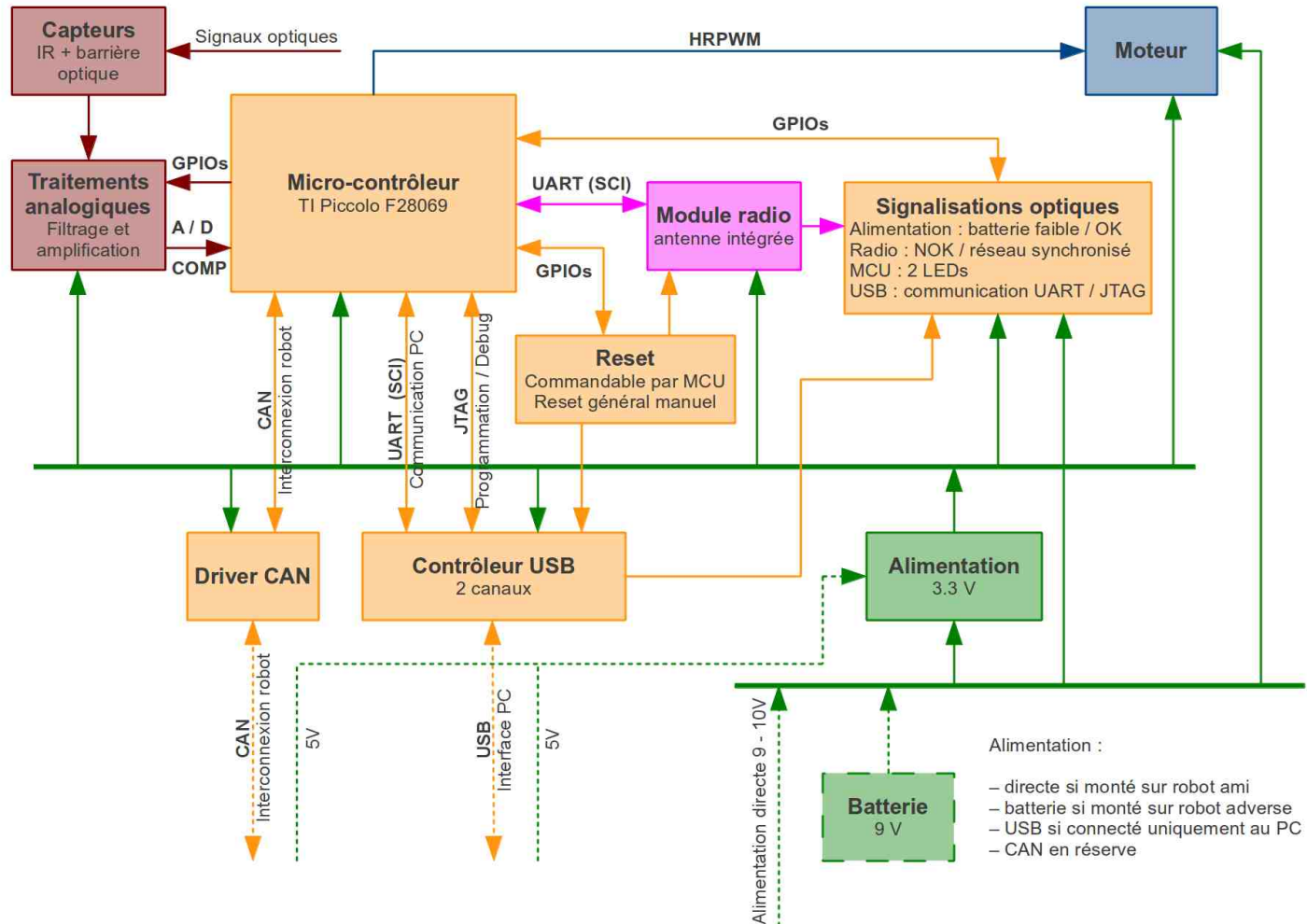
Filtre passe-haut
Butterworth 2ème ordre
Gain = 2, $f_c = 1.6$ kHz



Traitement numérique

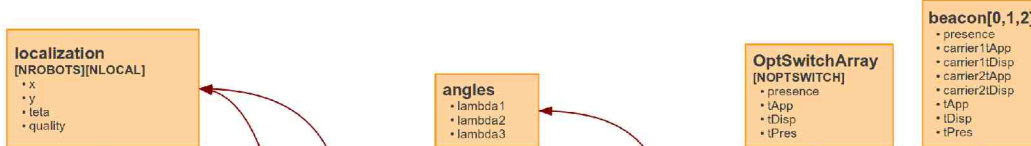


Électronique module



Architecture logicielle

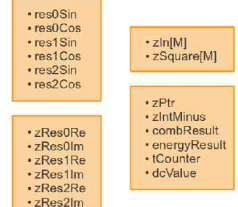
Mémoire CPU



Mémoire partagée

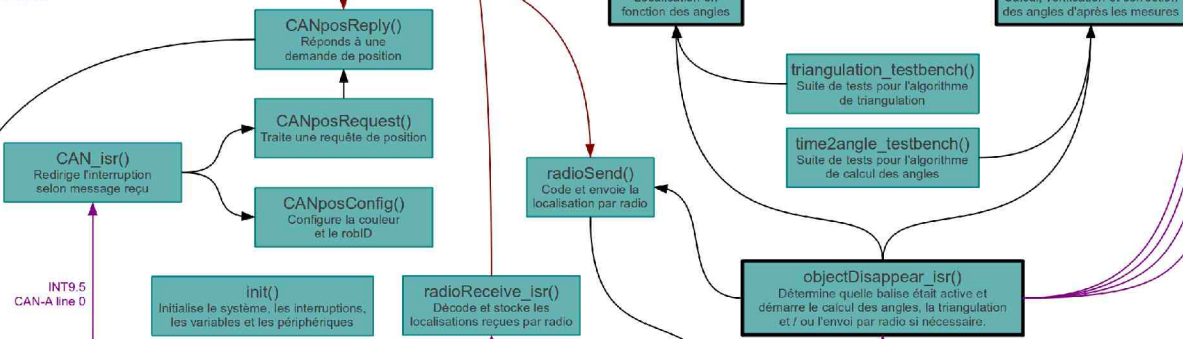


Mémoire CLA



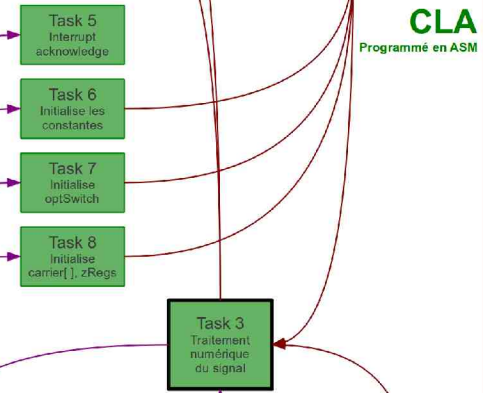
CPU

Programmé en C



CLA

Programmé en ASM



Périphériques



Conclusion

