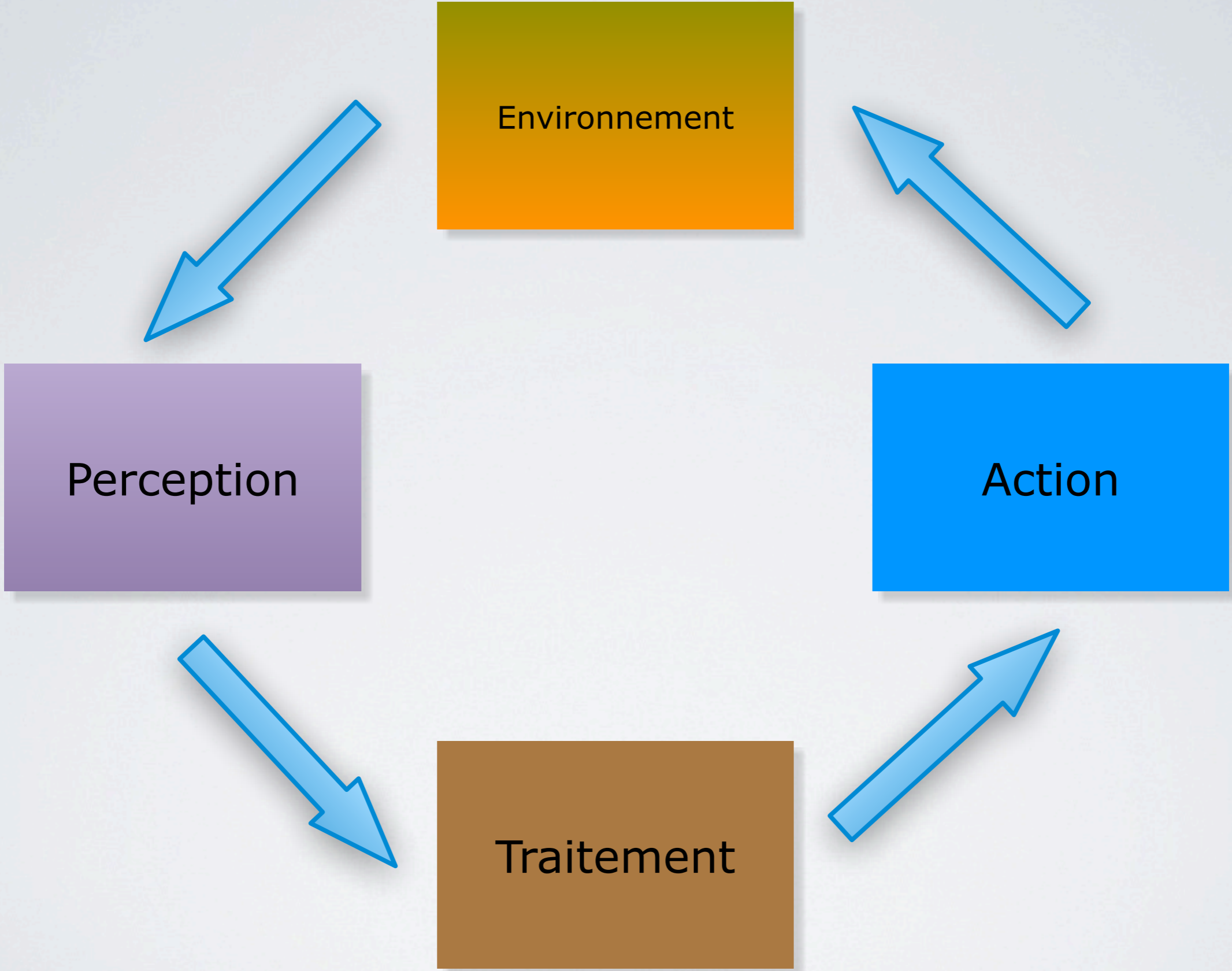


roboooly

Le Capteur Infrarouge

QU'EST-CE QU'UN CAPTEUR?



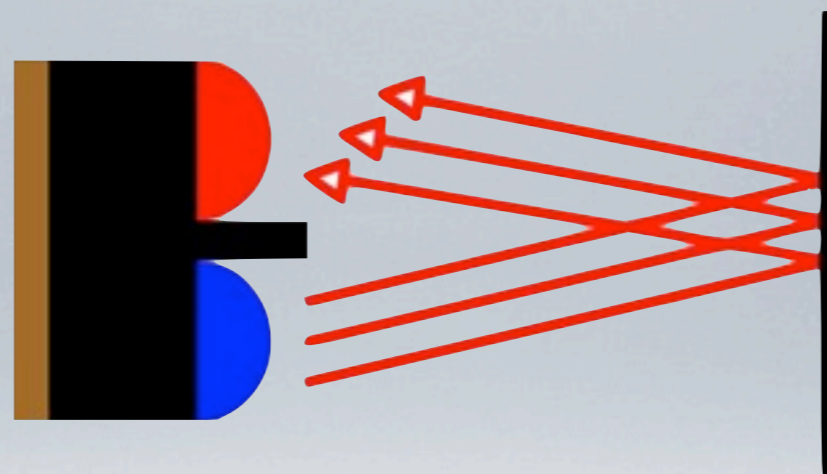
Environnement

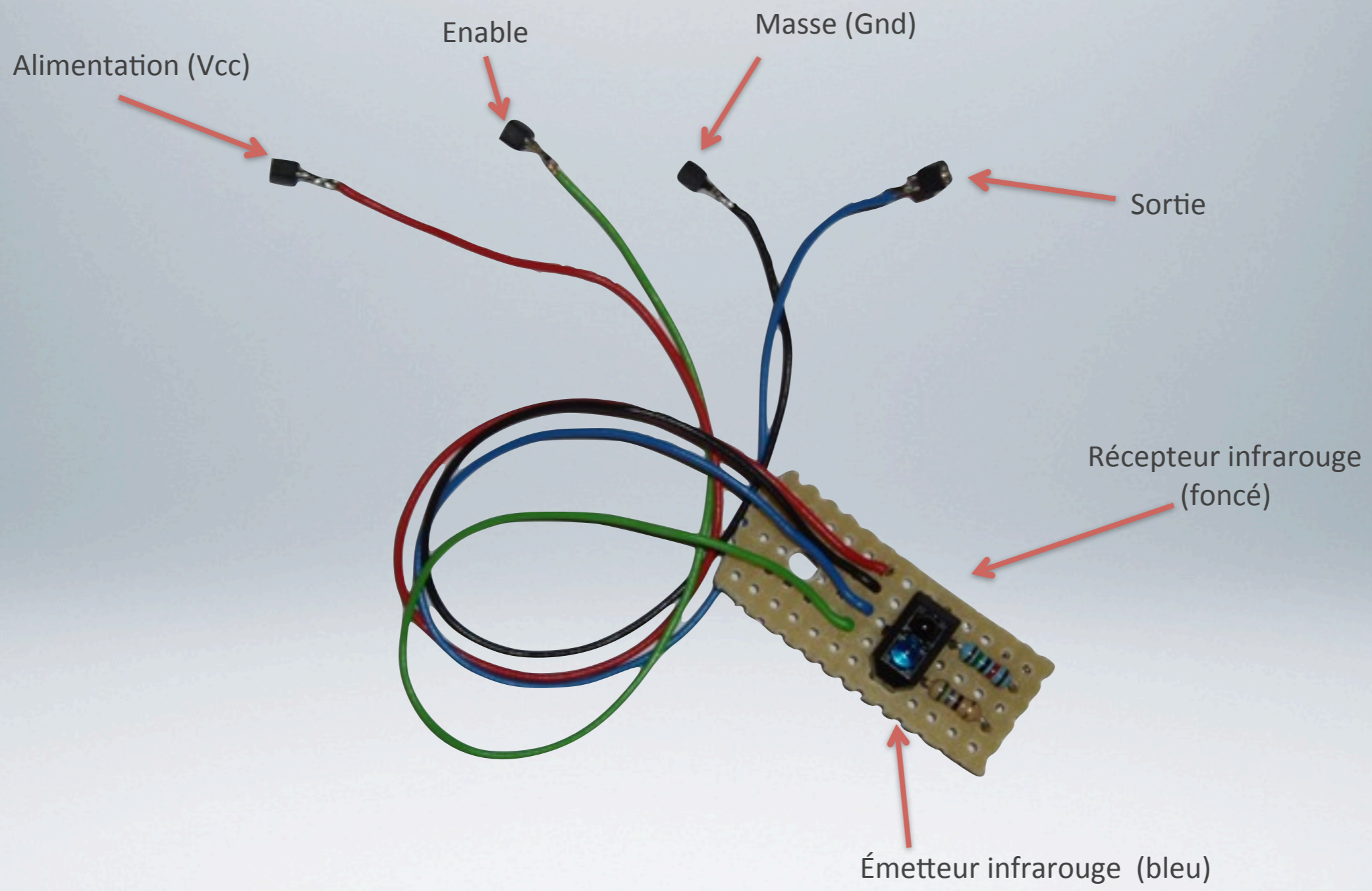
Perception

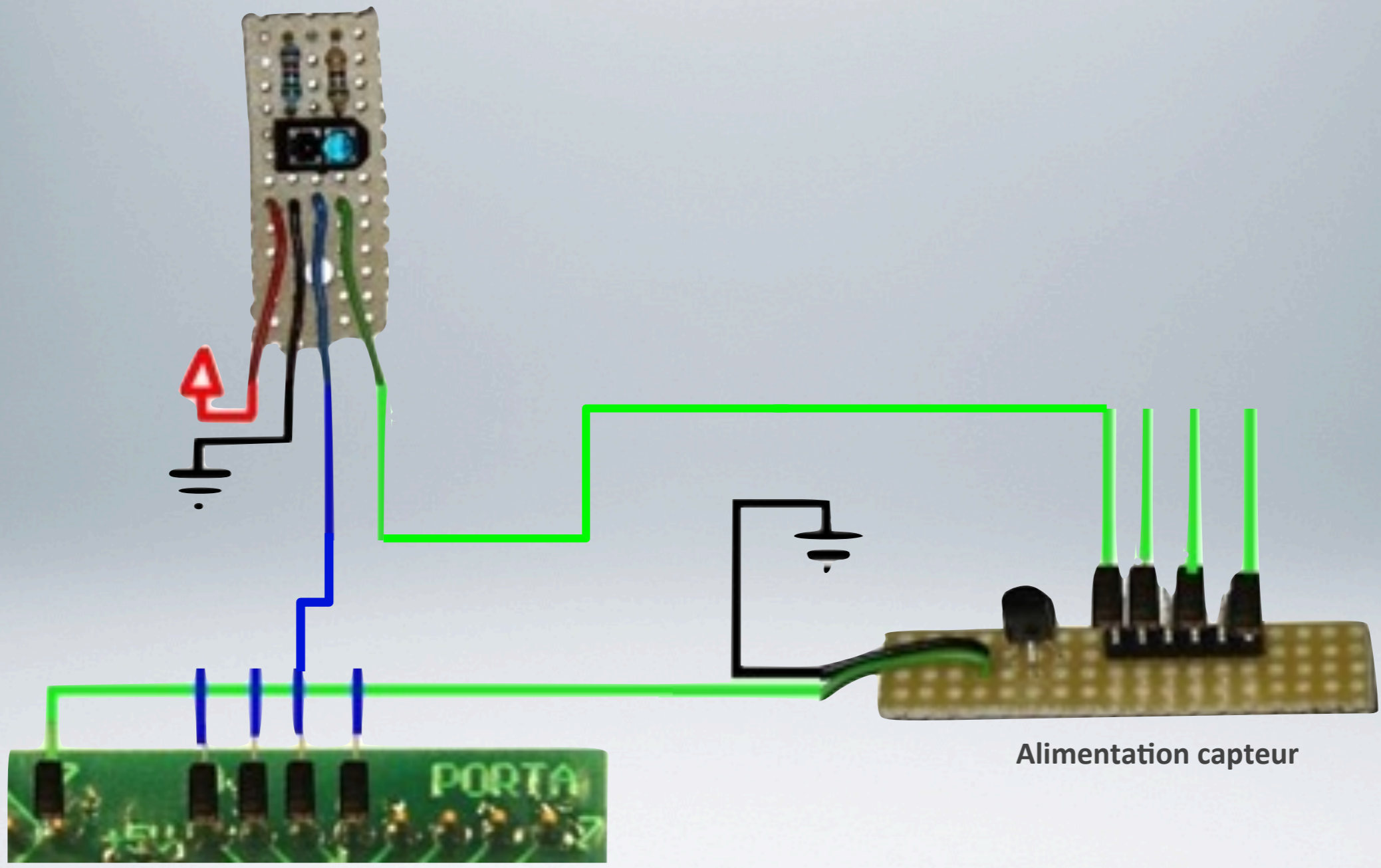
Action

Traitement

NOTRE CAPTEUR

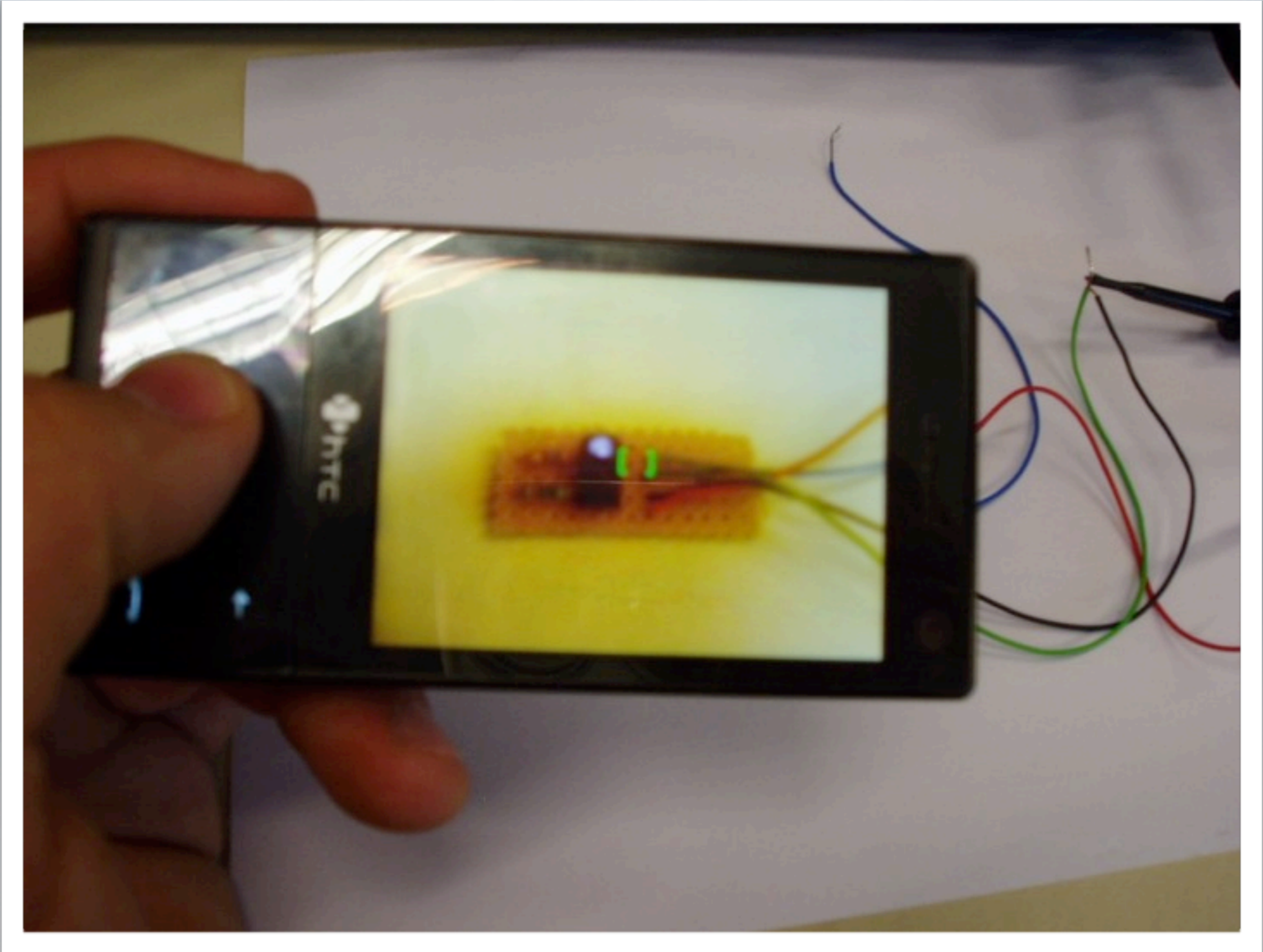






Microcontrôleur

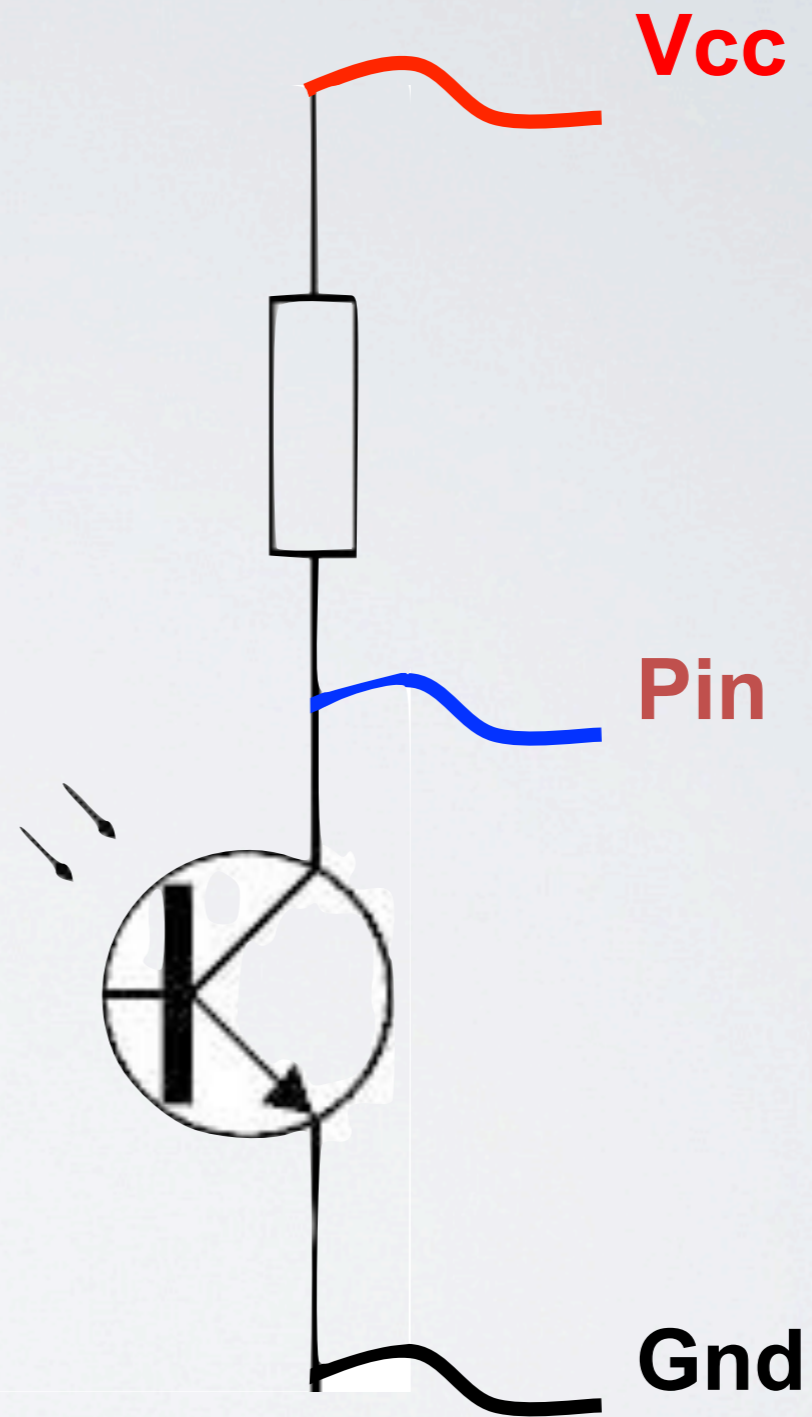
Alimentation capteur



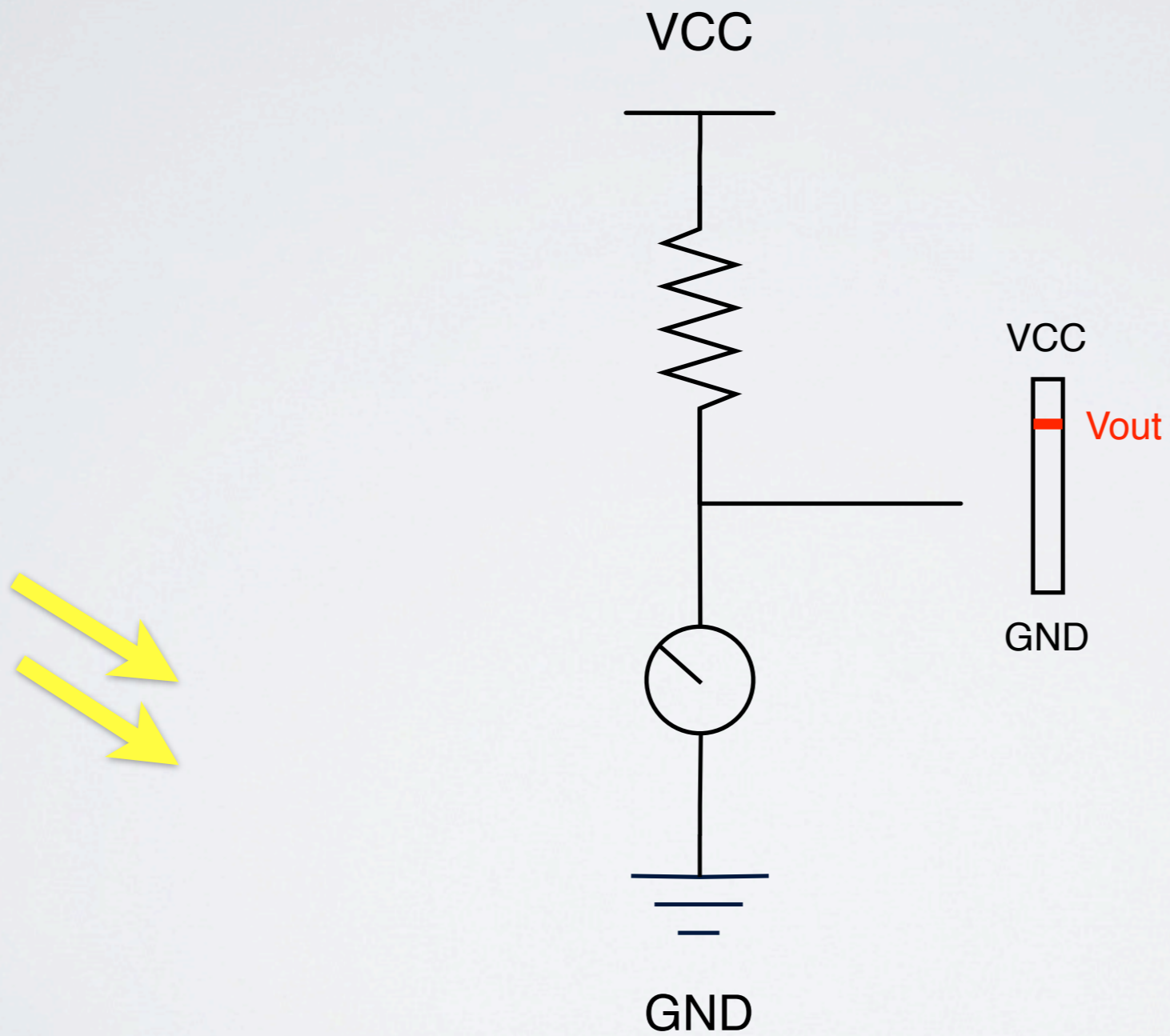
LECTURE ANALOGIQUE

PHOTO- TRANSISTOR

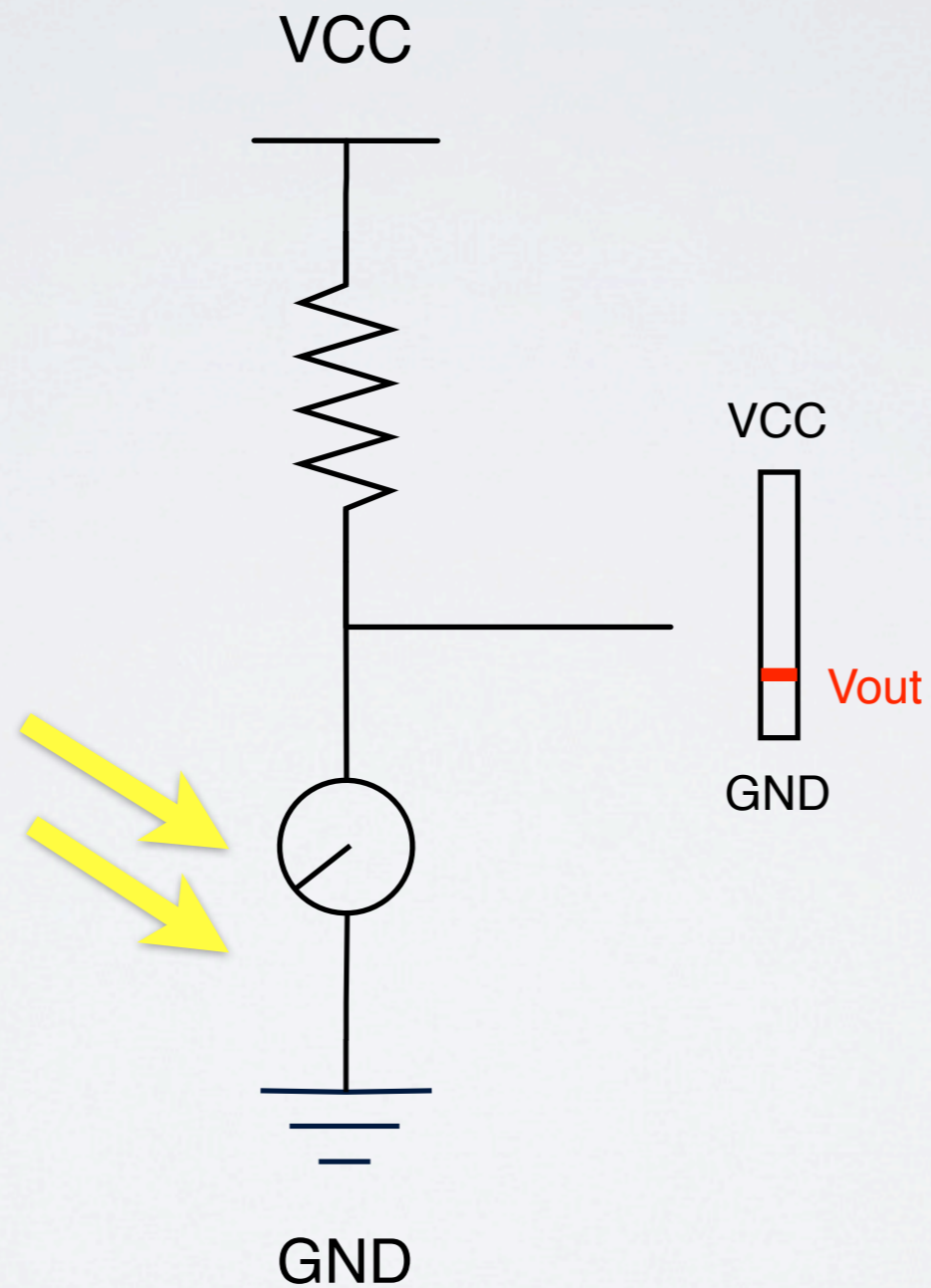
Récepteur de lumière



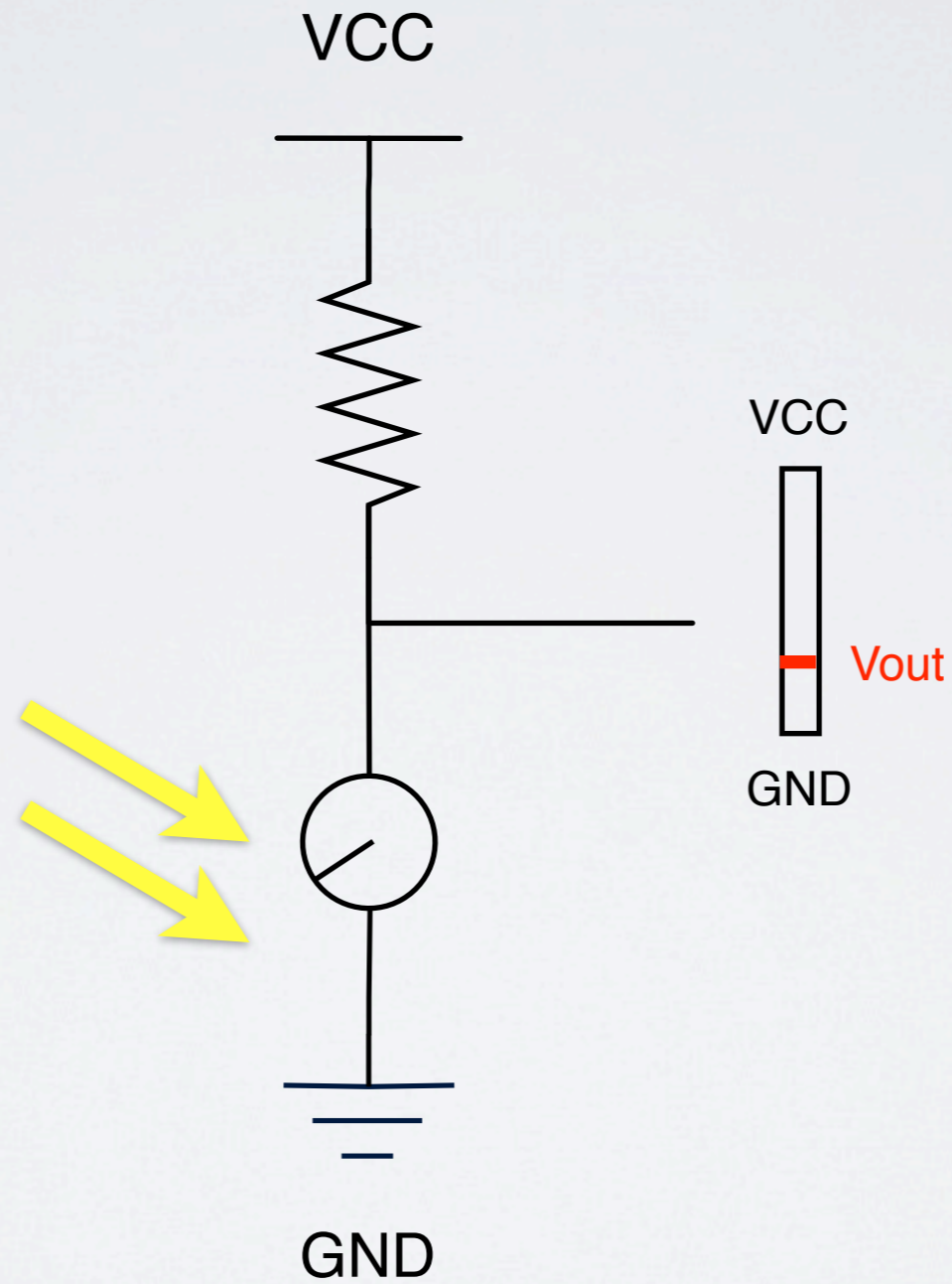
CIRCUIT ÉLECTRONIQUE



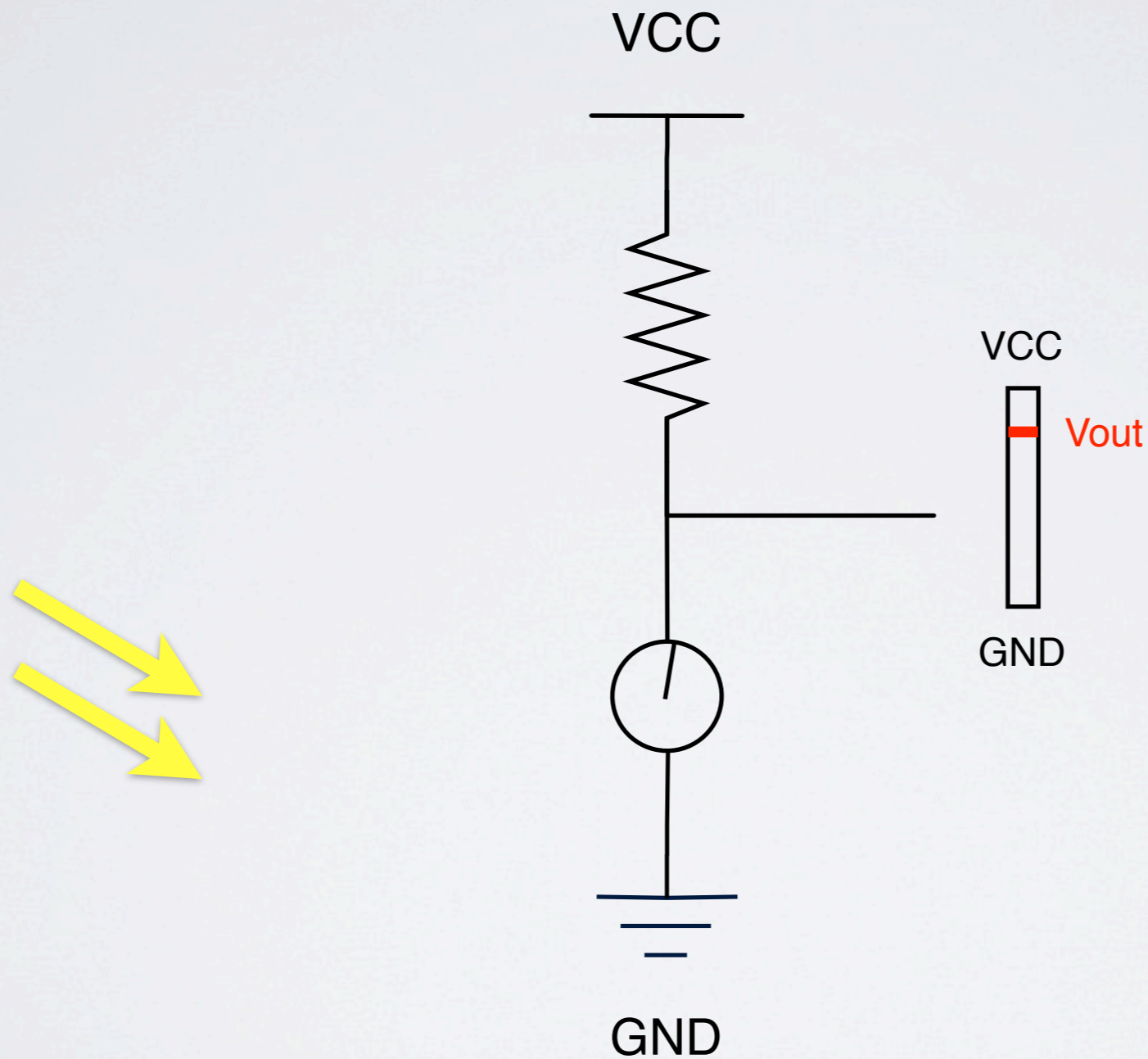
CIRCUIT ÉLECTRONIQUE



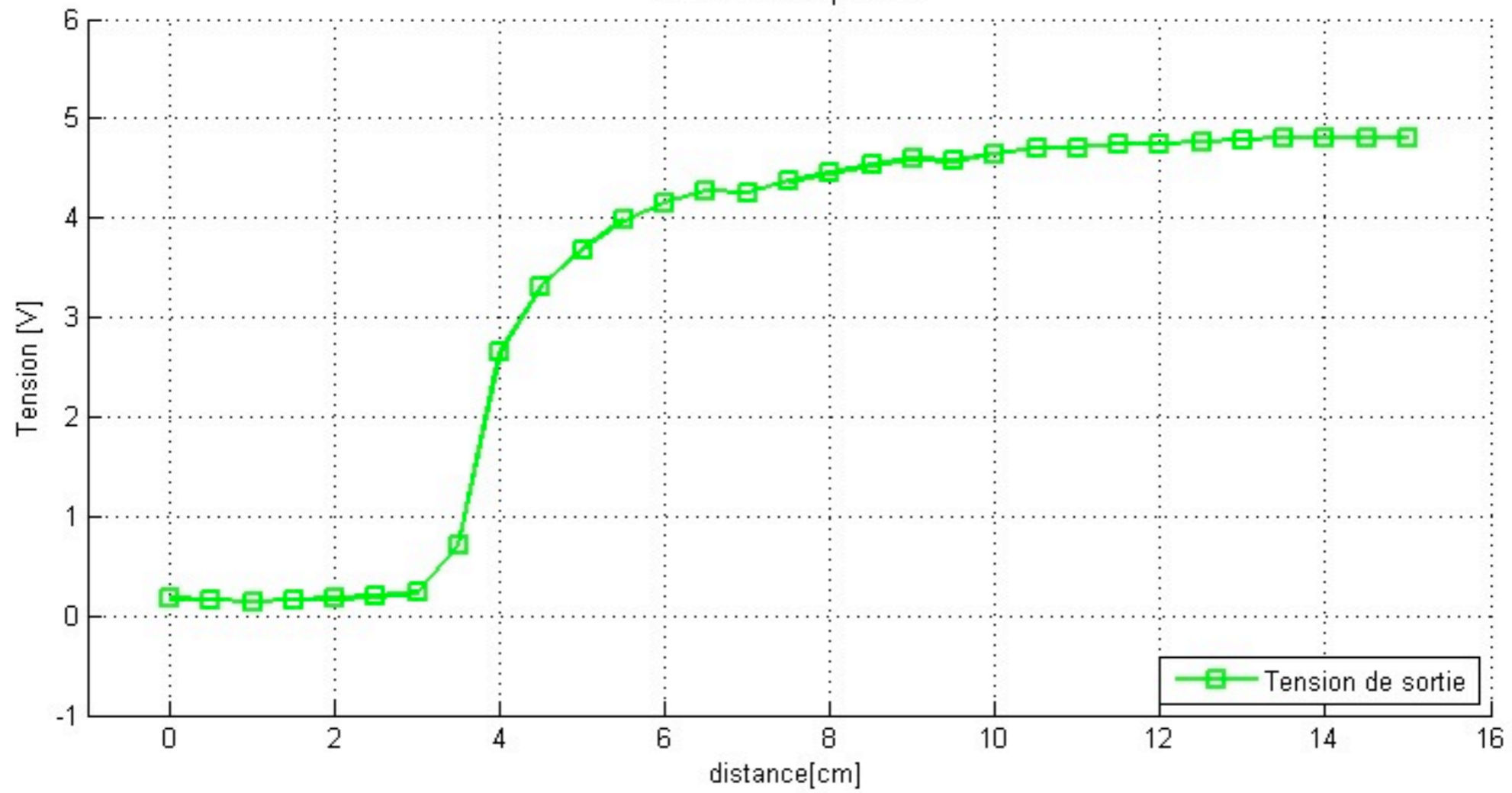
CIRCUIT ÉLECTRONIQUE



CIRCUIT ÉLECTRONIQUE



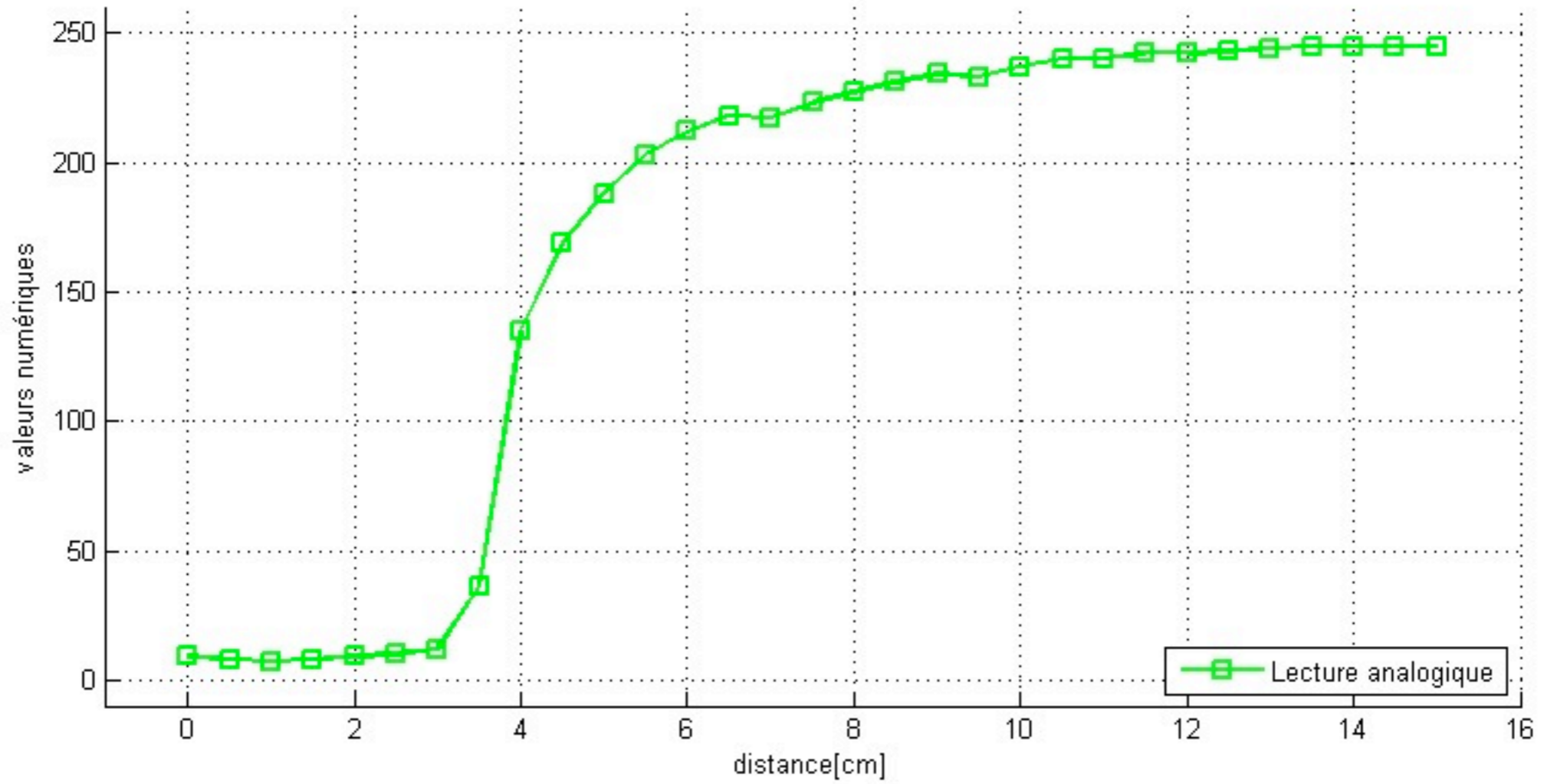
Lecture d'un capteur IR



`analogReadPortA(bit)`

retourne entre 0 (GND) à 255(VCC)

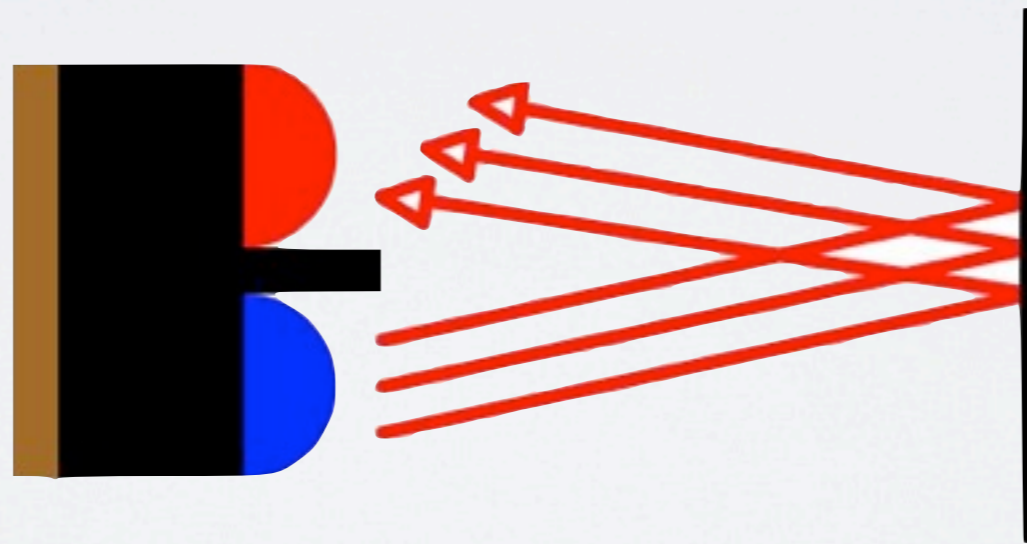
Lecture d'un capteur IR



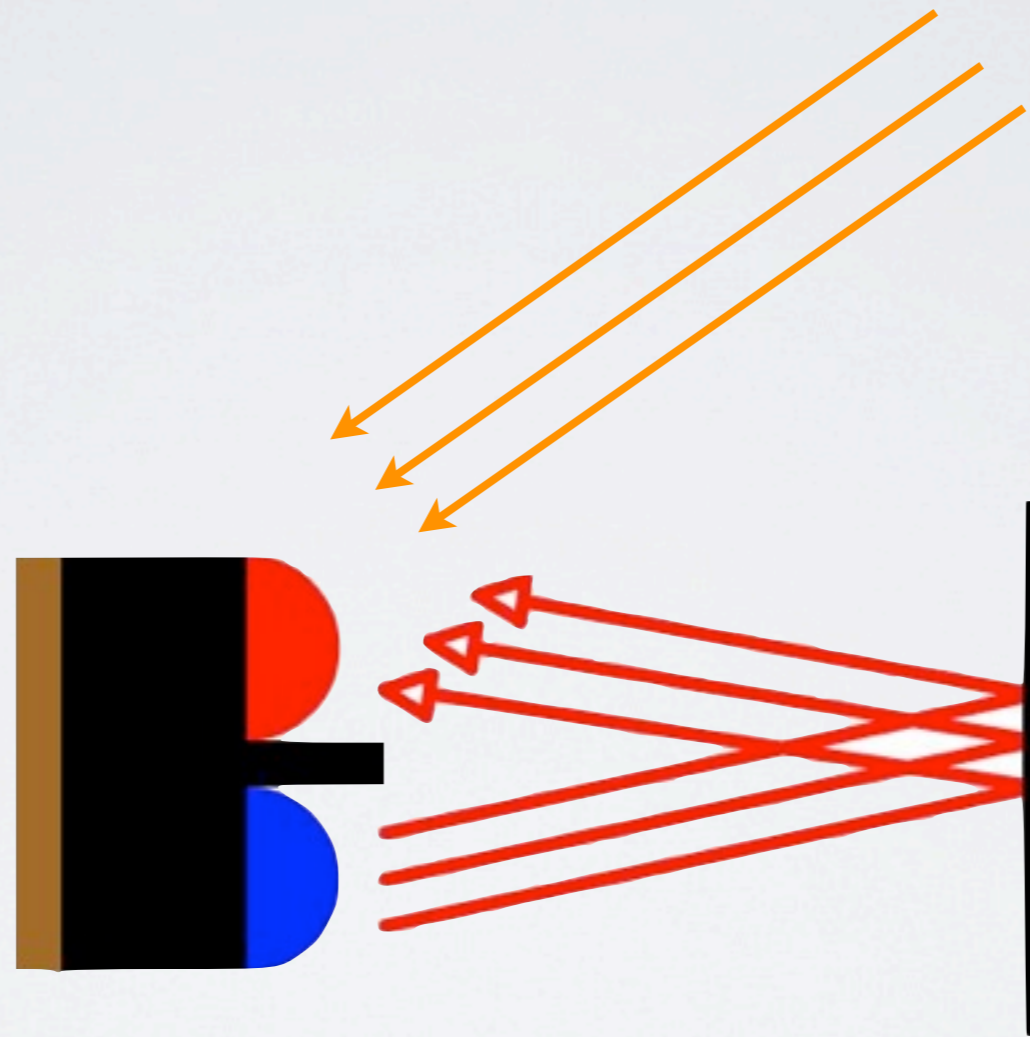
DÉMOS

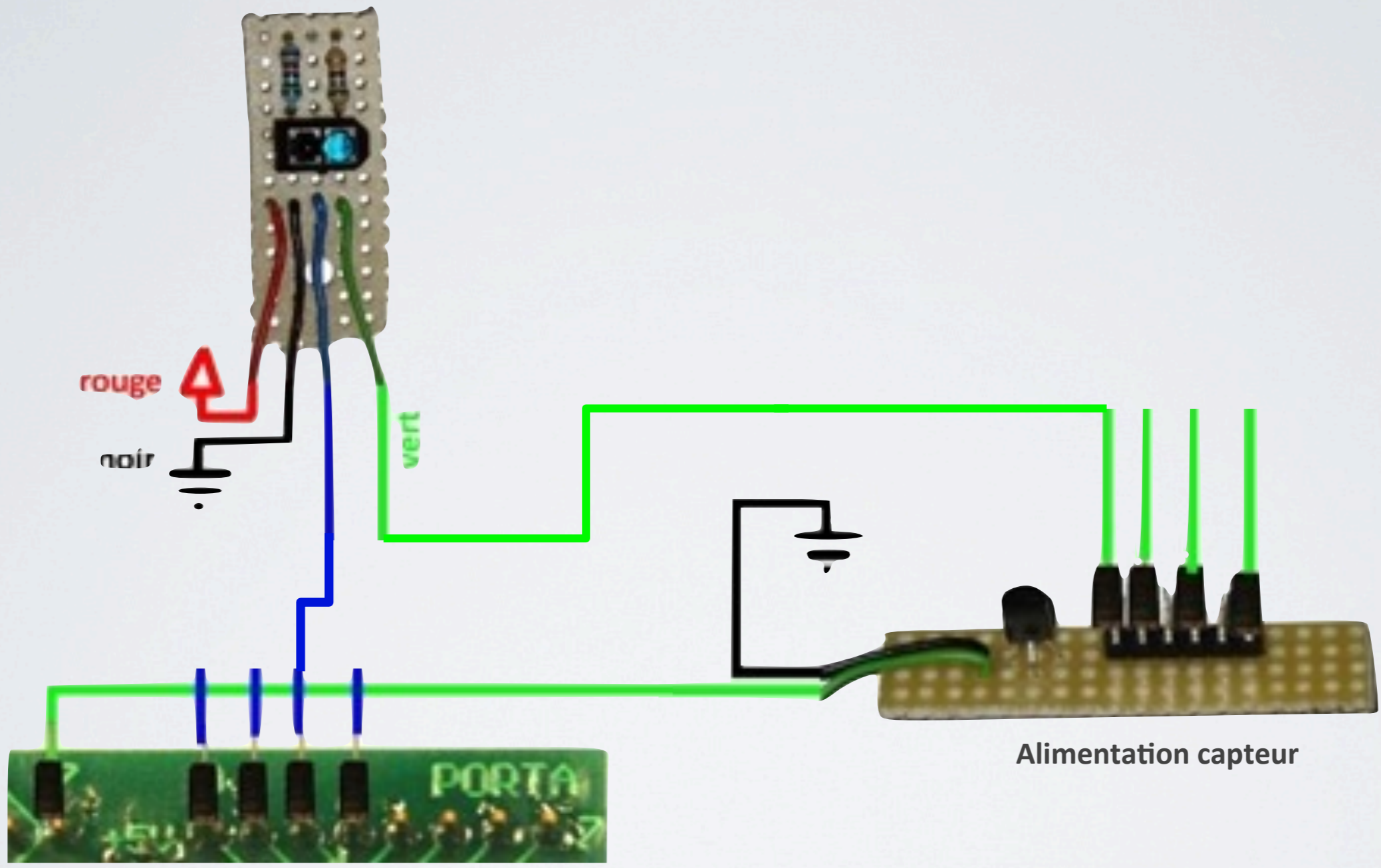


LUMIÈRE AMBIANTE



LUMIÈRE AMBIANTE





rouge

noir

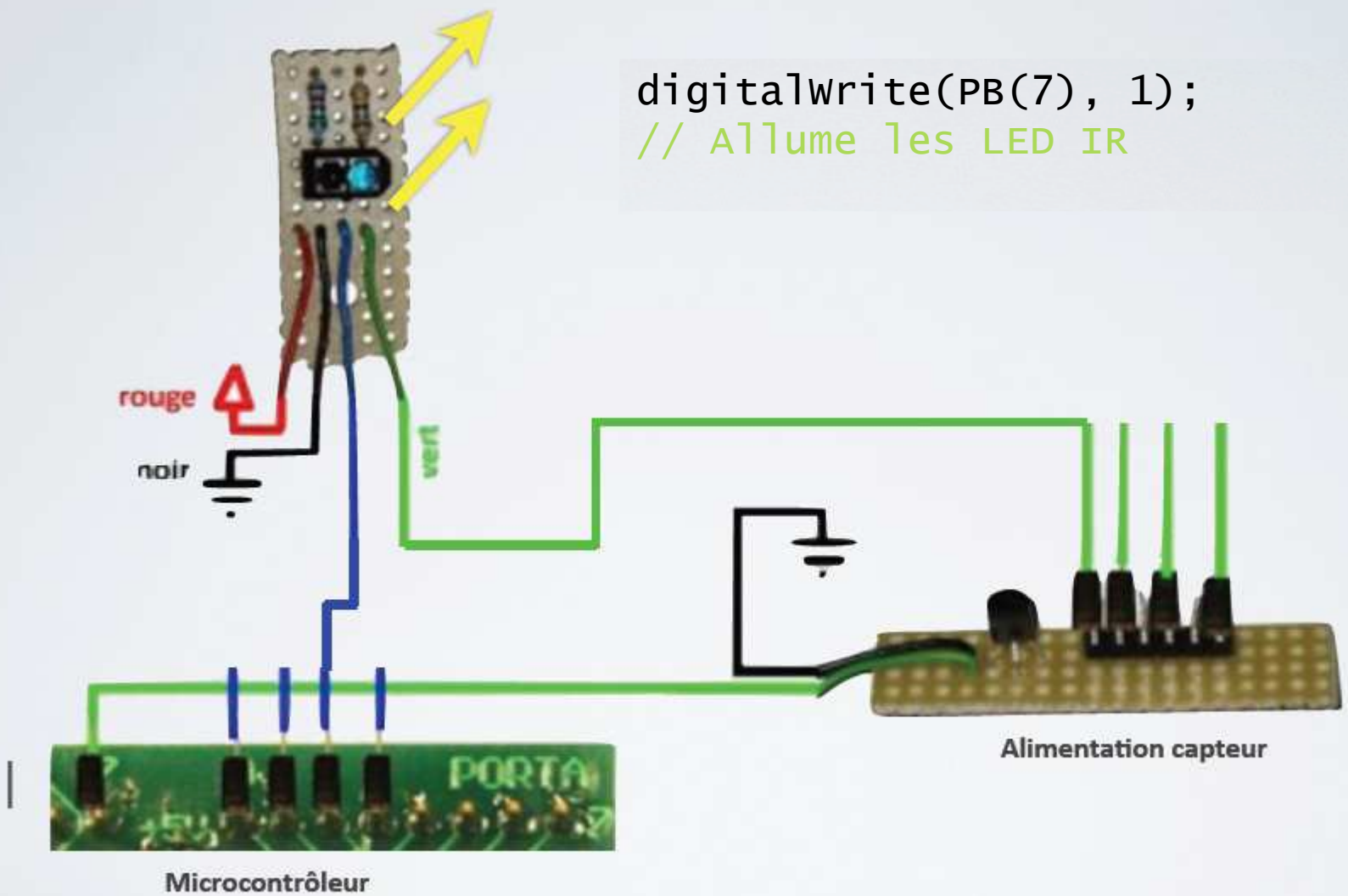
vert

Alimentation capteur

Microcontrôleur

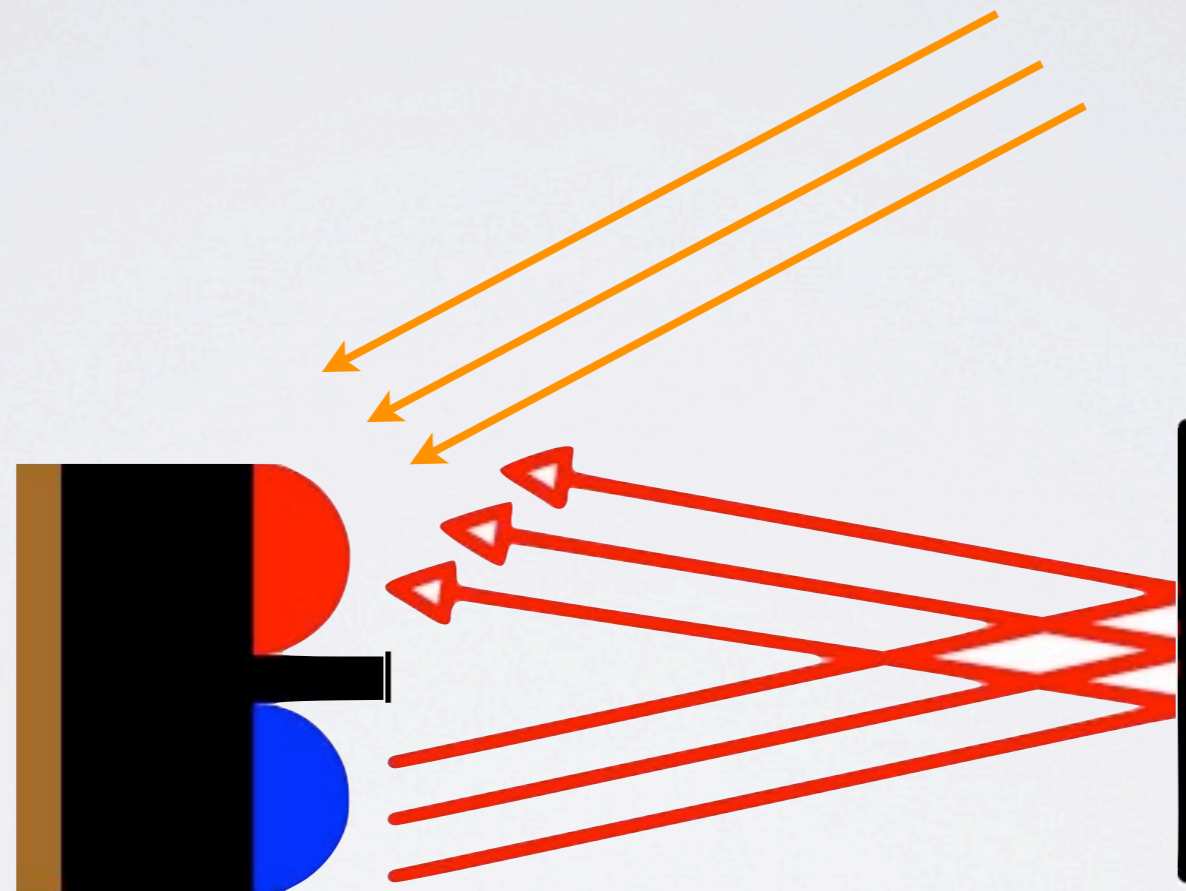
PORTA

5V



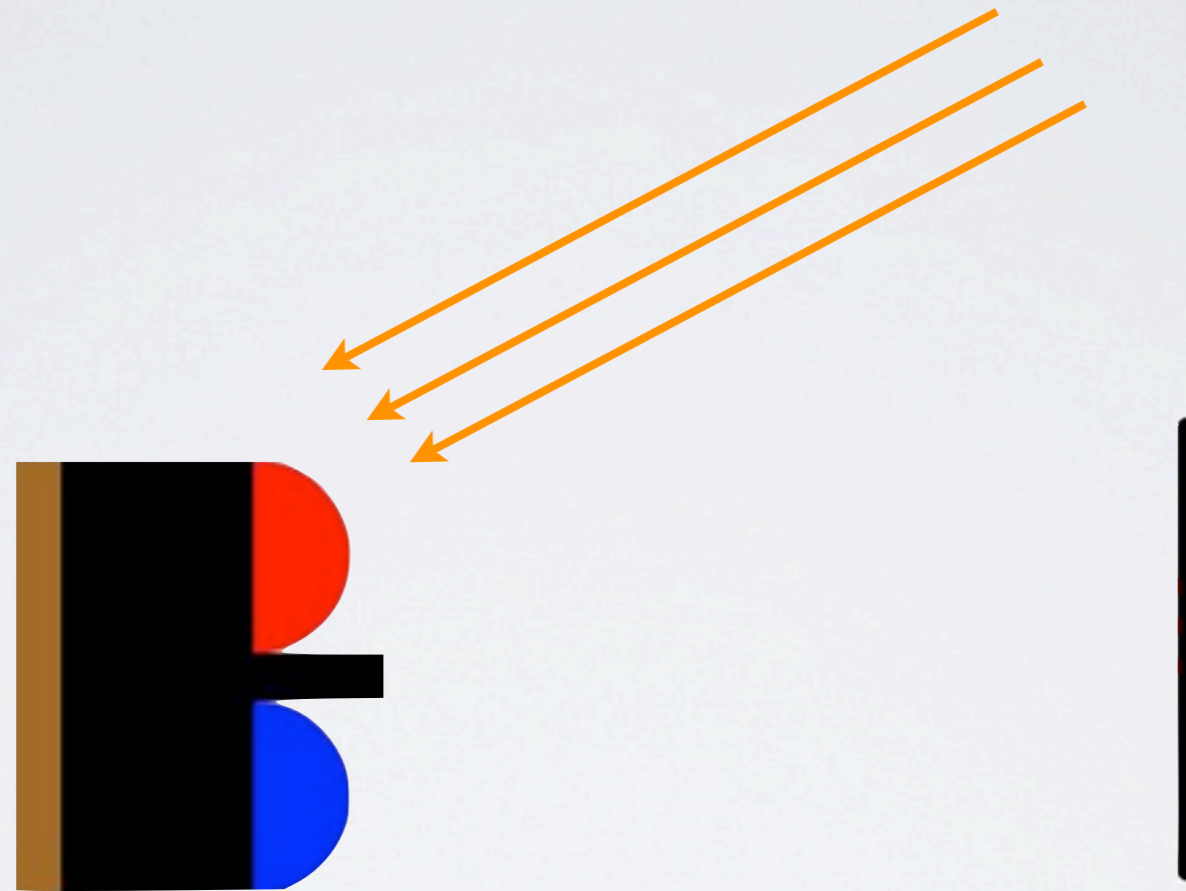
```
digitalWrite(PB(7), 1);  
// Allume les LED IR
```


LUMIÈRE AMBIANTE



En temps normal : composante IR + ambiante
On veut que la composante IR

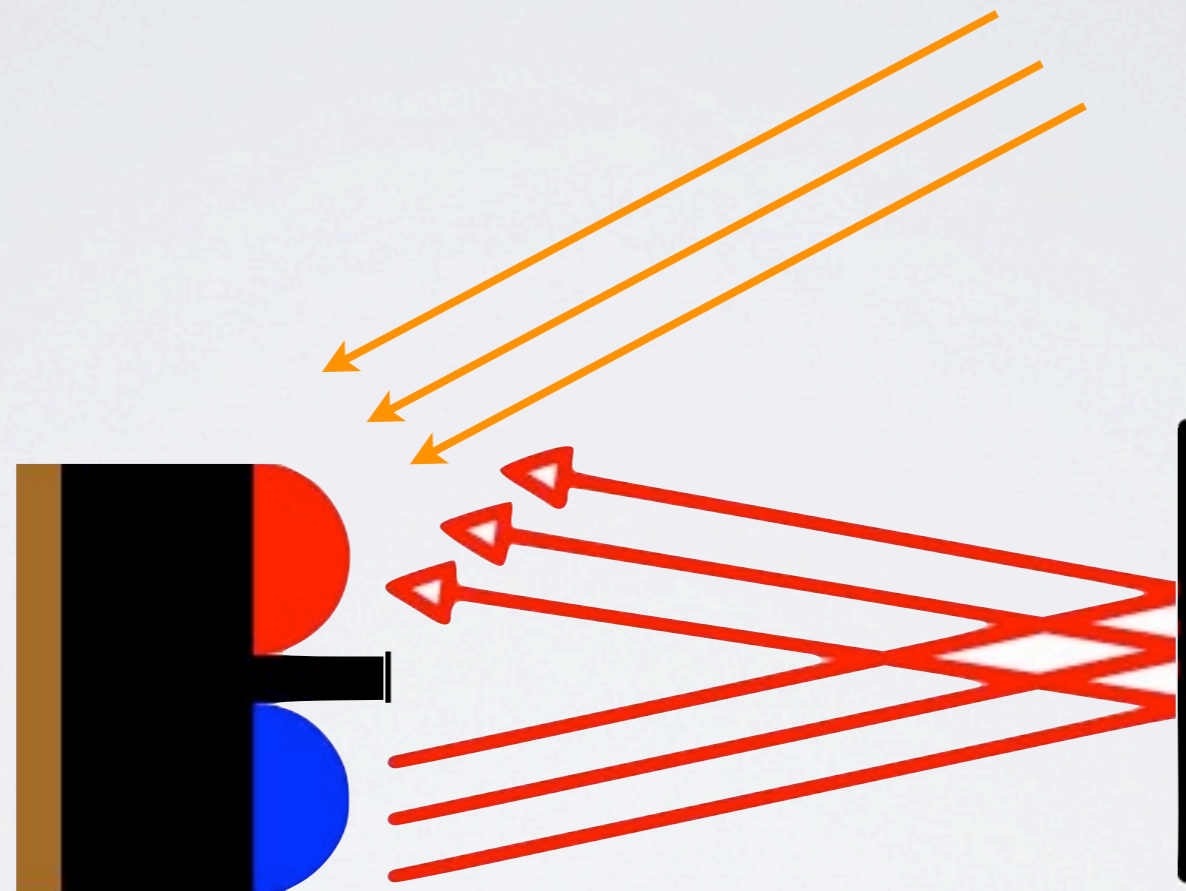
LUMIÈRE AMBIANTE



On éteint la LED IR

Il ne reste que la composante ambiante (SANSIR)

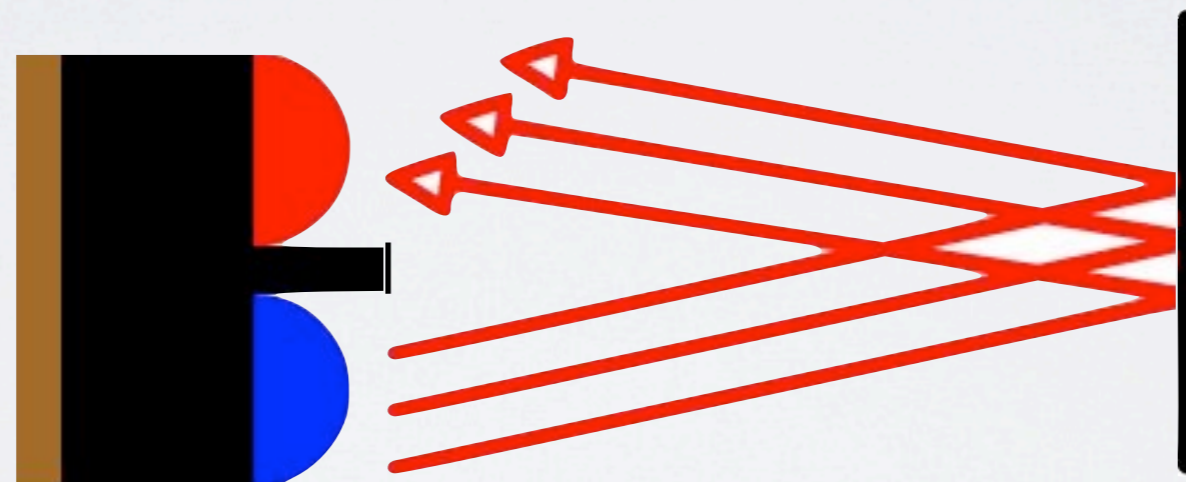
LUMIÈRE AMBIANTE



On rallume la LED IR

On prend la mesure avec les deux composantes (AVECIR)

LUMIÈRE AMBIANTE

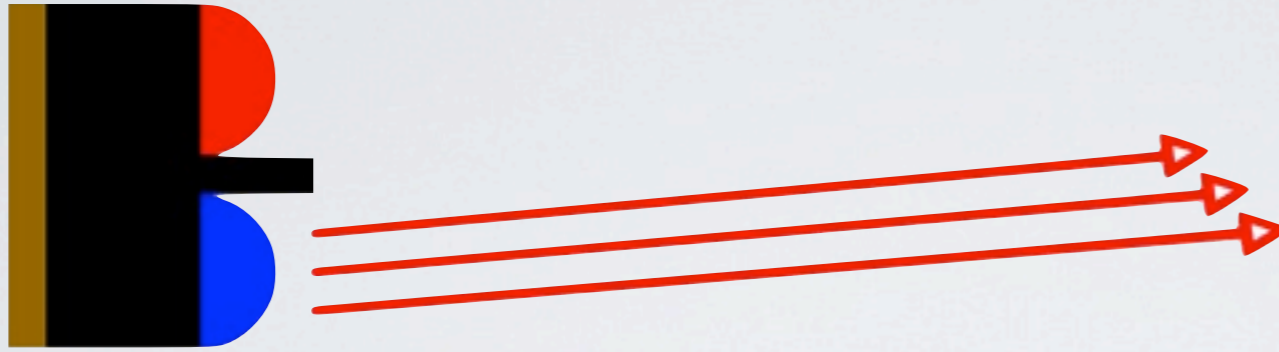


On fait la soustraction AVECIR-SANSIR
Il nous reste que la composante IR!

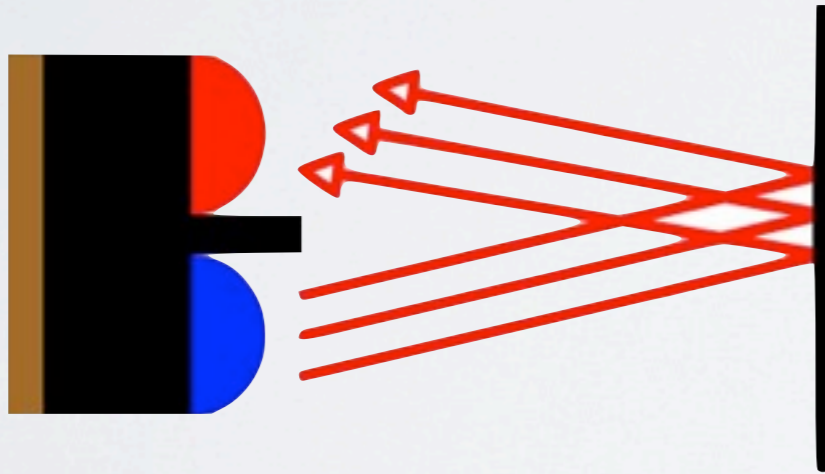
```
digitalWrite(PB(7),0);  
// Eteindre les LED IR  
unsigned char sansIR = analogReadPortA(bit);  
// Prendre une mesure sans IR  
digitalWrite(PB(7),1);  
// Allumer les LED IR  
unsigned char avecIR = analogReadPortA(bit);  
// Prendre une mesure avec IR  
unsigned int vraieValeur = 255 - sansIR + avecIR;
```

DÉMOS

LECTURE NUMÉRIQUE

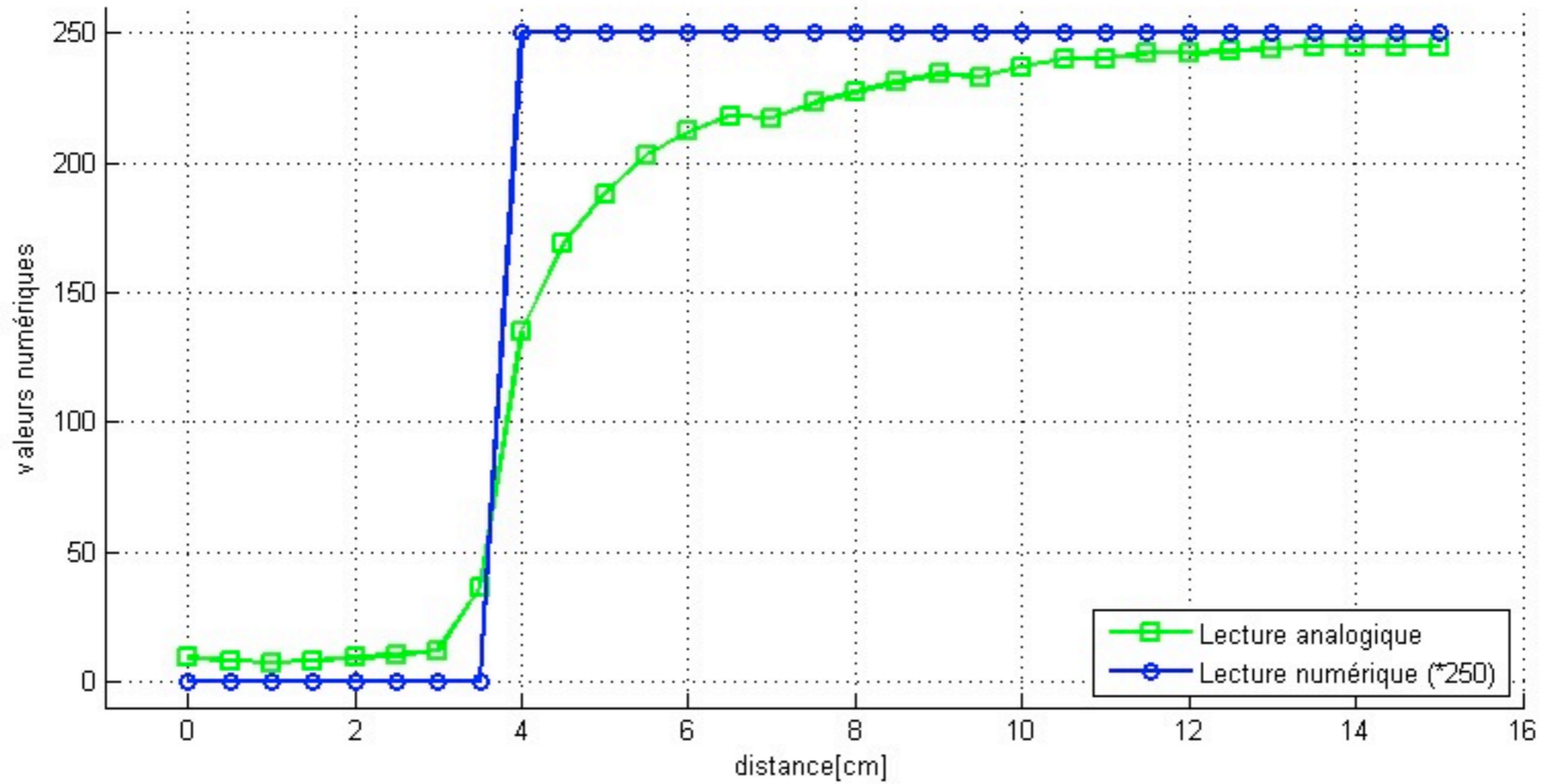


Sortie = 1



Sortie = 0

Lecture d'un capteur IR



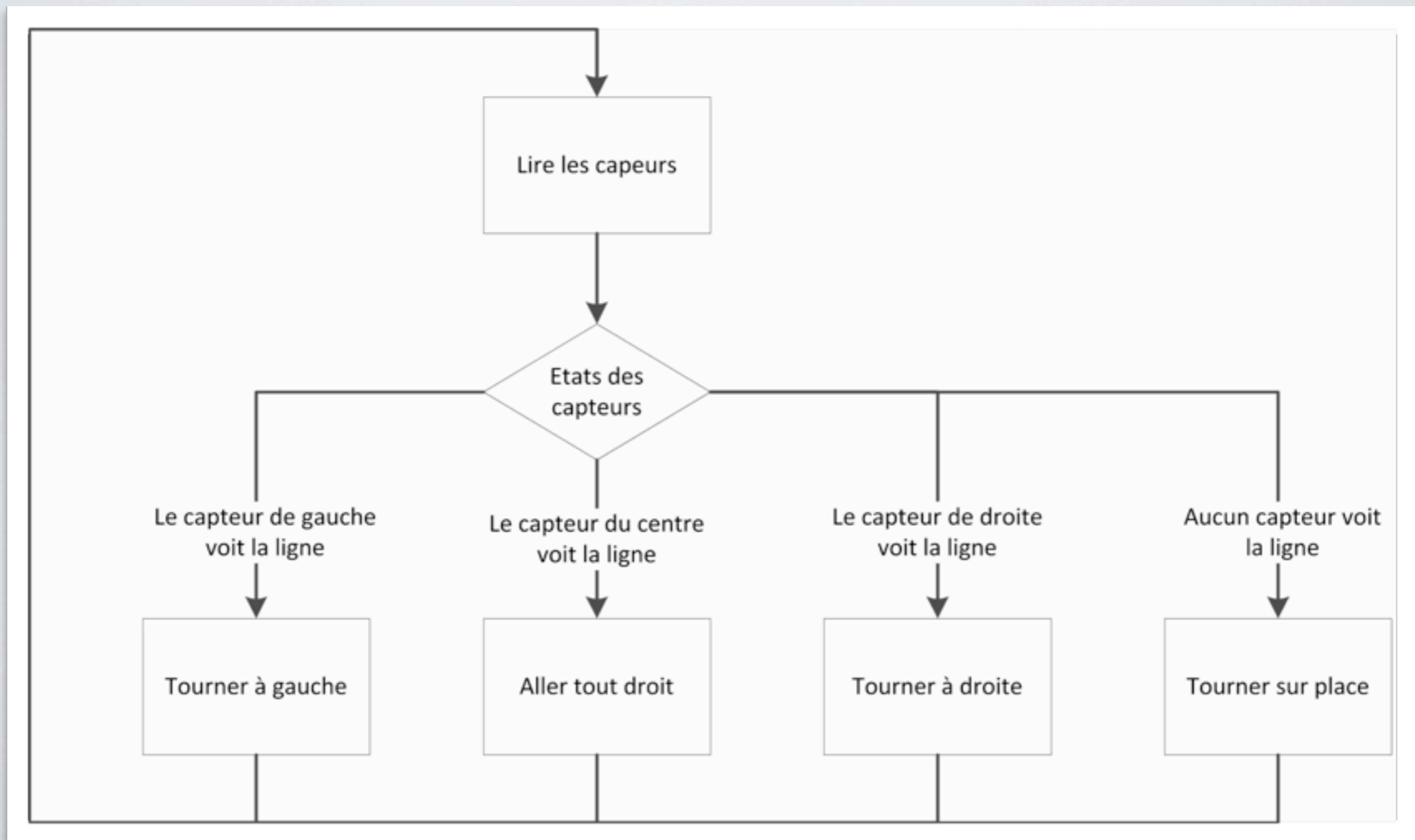

```
digitalWrite(PB(7), 1);  
// Allume les LED IR  
unsigned int value = digitalRead(PA(2));  
// Lit le PIN 2 du PORT A
```

value sera 0 (GND) ou 1 (VCC)

APPLICATIONS

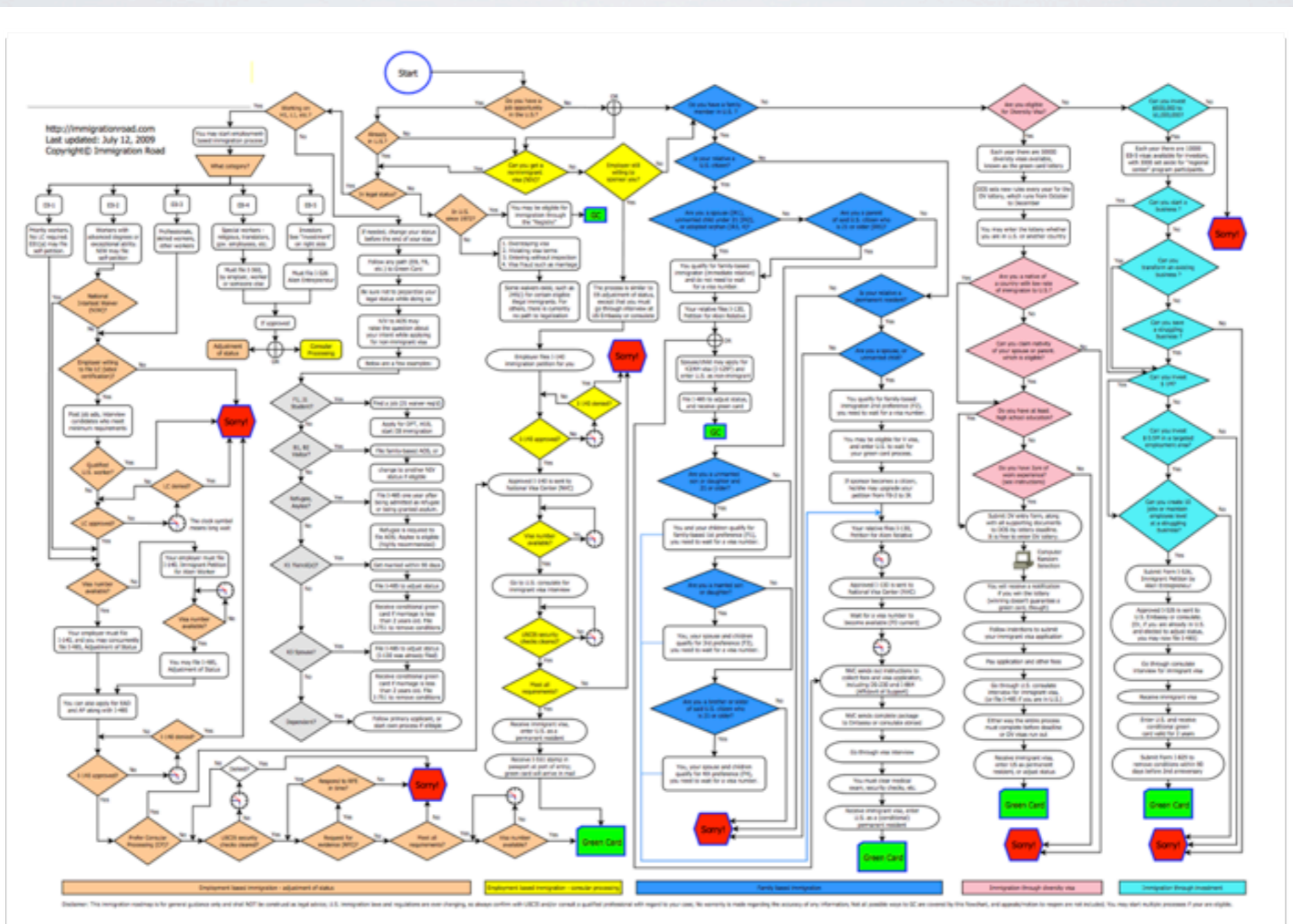
APPLICATIONS

Suivi de ligne



APPLICATIONS

Systeme de dockage de navette orbitale





<http://robopoly.epfl.ch>



@RobopolyEPFL



Robopoly



robopoly@epfl.ch



RobopolyEPFL