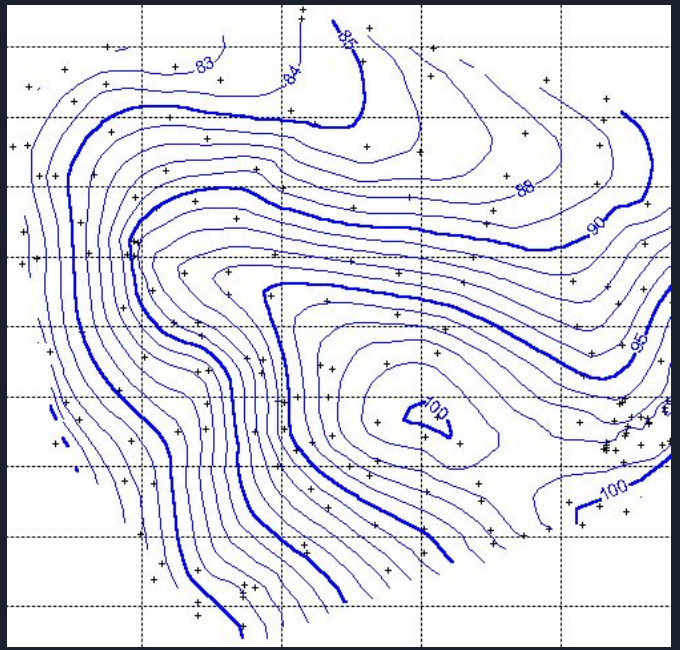
année 2022-2023

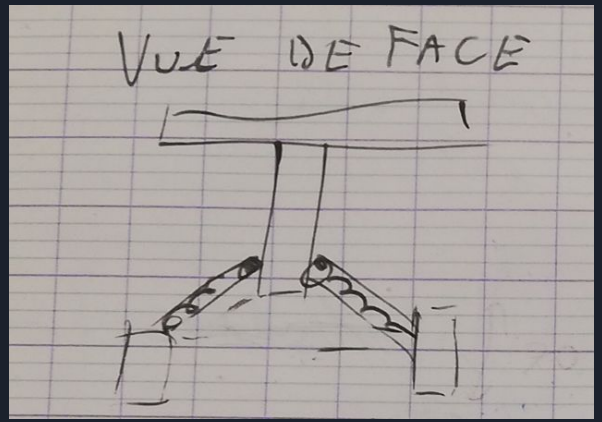
Le Polydar

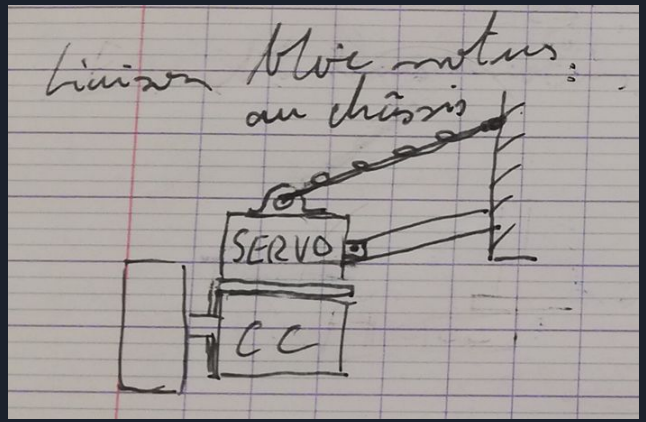
Gissinger Esteban et Vermot-Desroches Matthias ROB 3

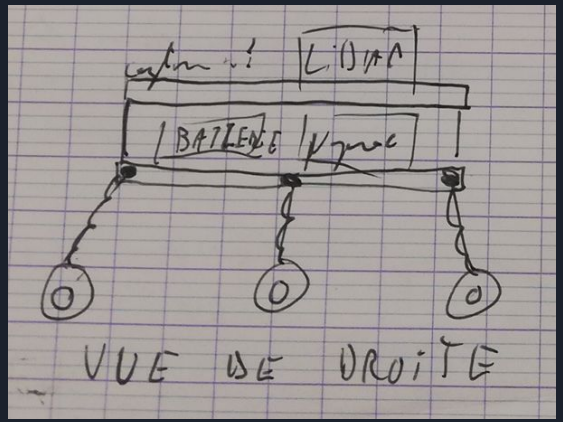
Introduction



Le châssis

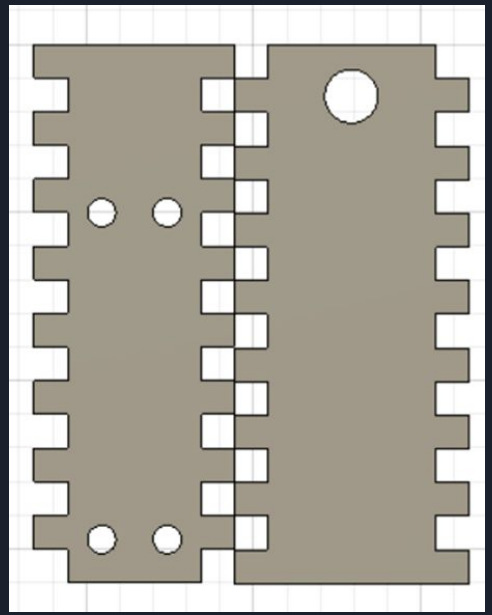

VUE DE FACE

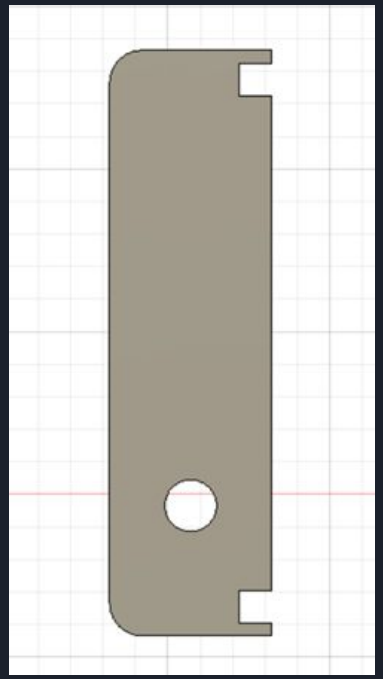

Liaison bloc moteur au châssis
SERVO
CC

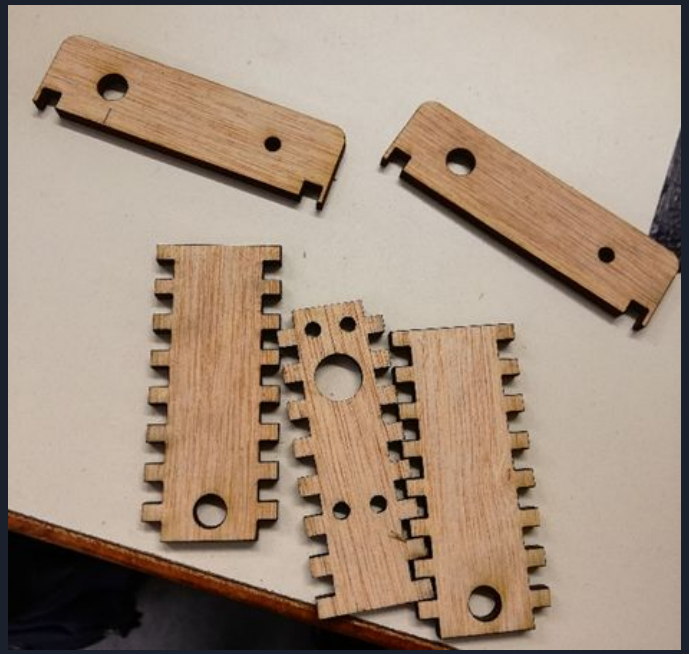

LIDAR
VUE DE DROITE

Le châssis

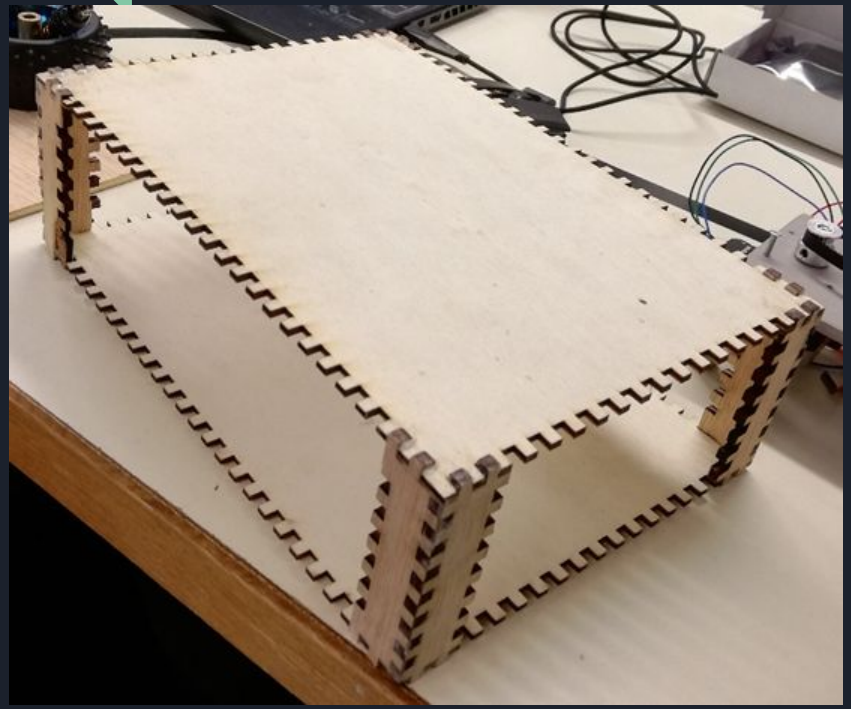
Modèles CAO et découpe

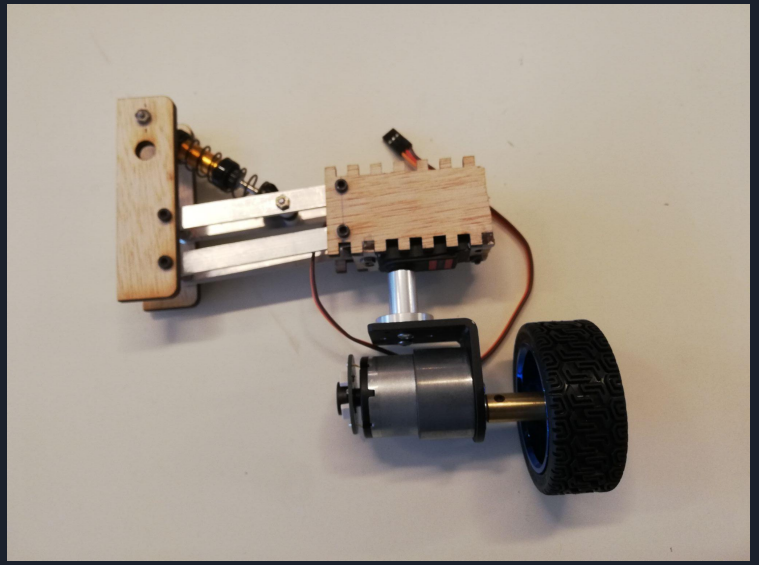




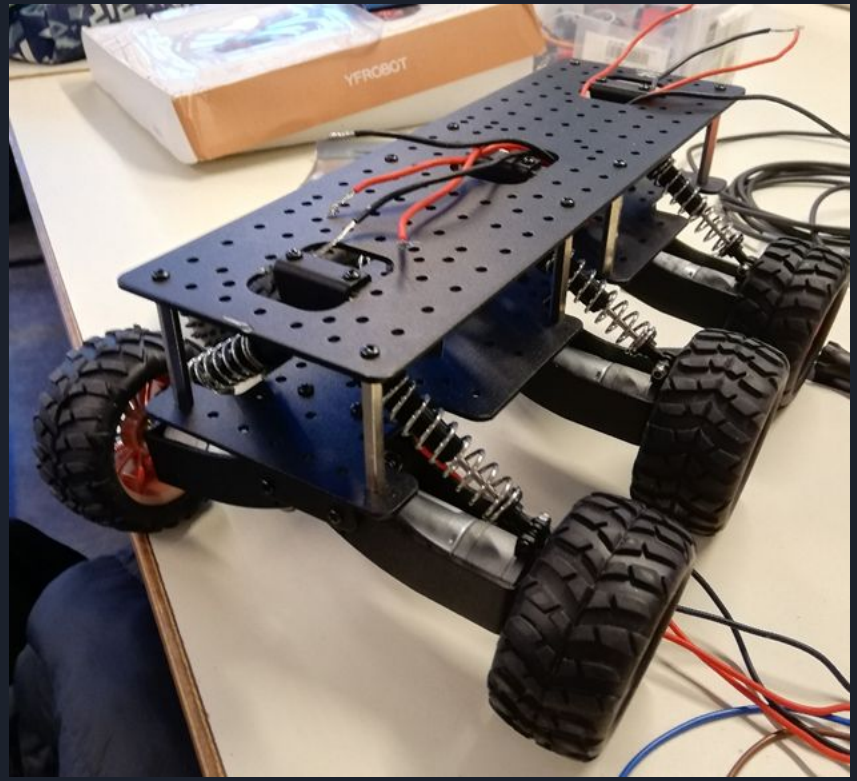


Le châssis

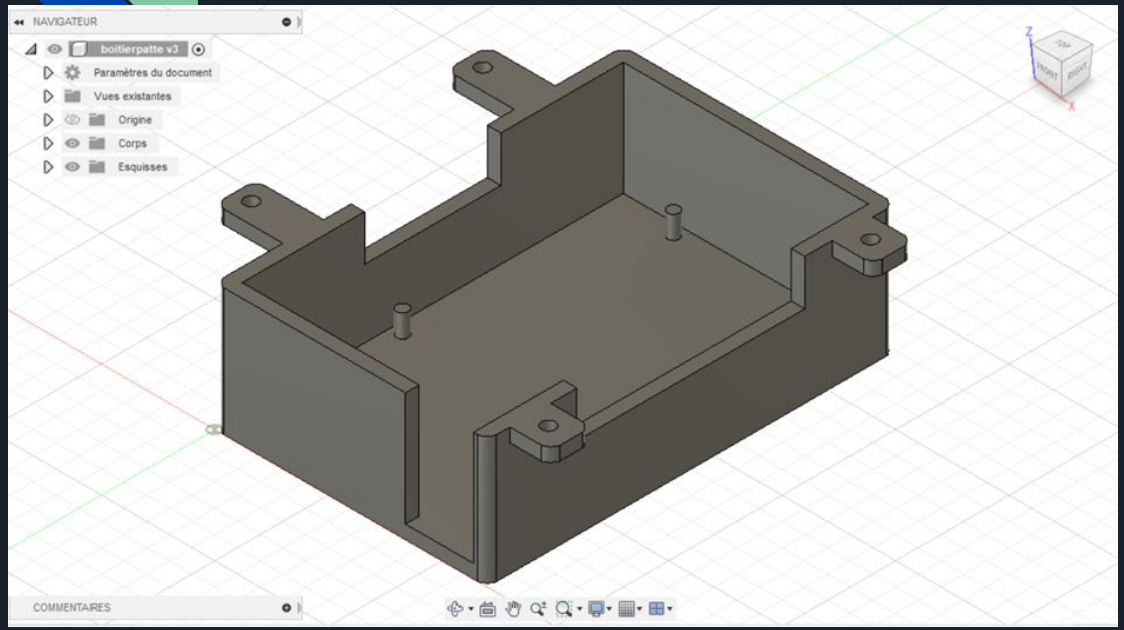


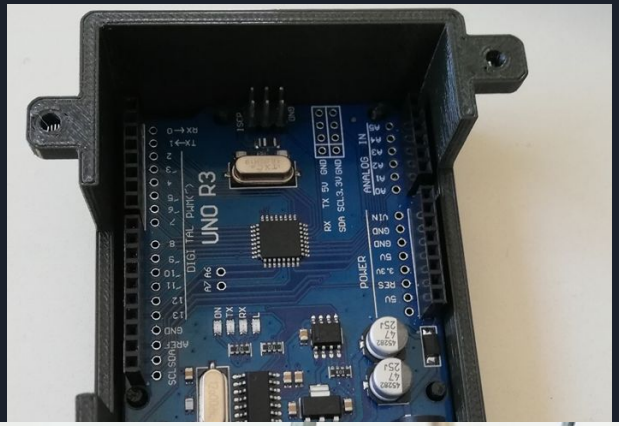


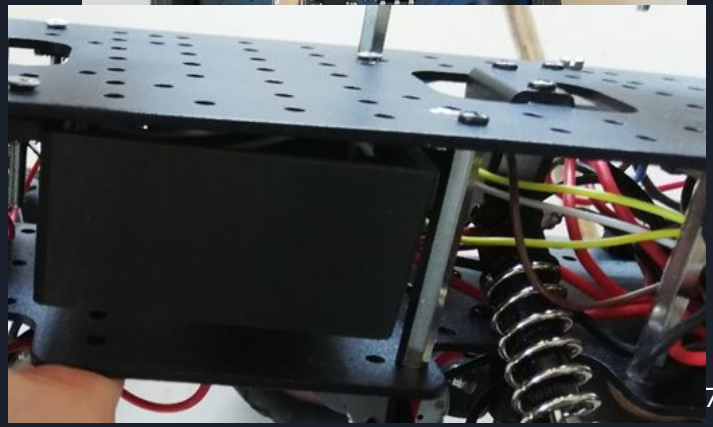
Le chassis



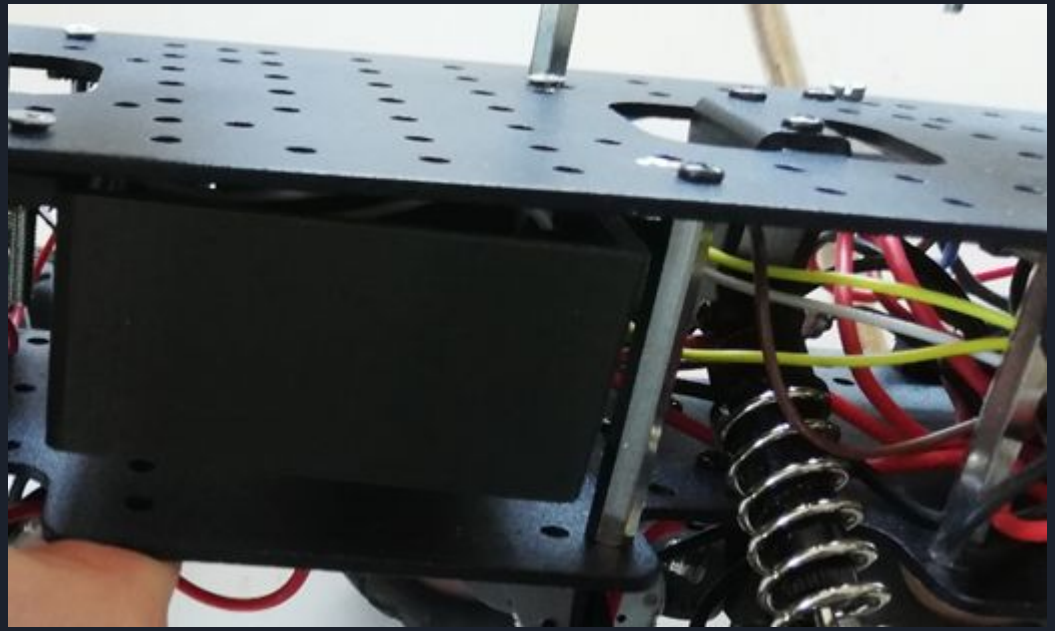
Le boîtier arduino



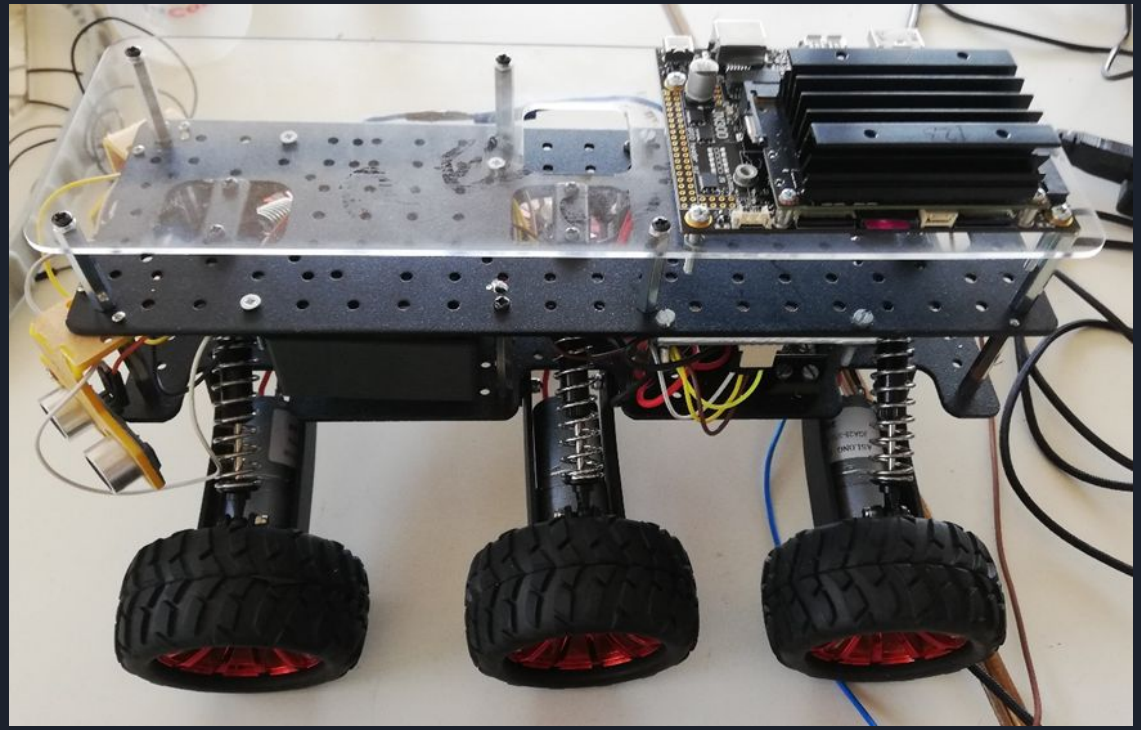




le boîtier arduino



driver moteur ? capteurs ultrasons? étage pmma ?



Le programme Arduino de la commande des moteurs

But : détecter des objets que le Lidar ne peut pas voir. exemple : une vitre, fenêtre

```
void loop() {
  Detection detecter;
  Tourner tourne;
  tourne.controle_vitesses_limites(vitesse_droite,vitesse_gauche);
  detecter.mesure_distance(trig2, echo2, trig, echo, distance_droite, distance_gauche);
  detecter.detection_obstacle(distance_droite, distance_gauche, vitesse_droite, vitesse_gauche, i, PWM1, PWM2, dir1, dir2);
```

```
void Detection::mesure_distance(int trig, int echo, int trig2, int echo2, int &distance_droite, int &distance_gauche) //fonction ayant pour but d
// afin de mesurer les distances entre le robot et un obstacle à gauche et à droite
{
  digitalWrite(trig,HIGH); //le port trig du capteur lance un ultrason
  delayMicroseconds(10);
  digitalWrite(trig,LOW);
  distance_droite = pulseIn(echo,HIGH)/2*0.034; // echo prends le temps de l'aller-retour de l'ultrason, on convertit ce temps en distance en mm.
  digitalWrite(trig2,HIGH);// même opération pour le second capteur
  delayMicroseconds(10);
  digitalWrite(trig2,LOW);
  distance_gauche = pulseIn(echo2,HIGH)/2*0.034;
  Serial.print("Distance à gauche :");
  Serial.println(distance_gauche);
  Serial.print("Distance à droite :");
  Serial.println(distance_droite);
```

```
void Tourner::tourneradroite(int &vitesse_gauche, int &vitesse_droite,int M2A,int M1A, int i, int dir1) //rotation vers la droite
  { Serial.println(digitalRead(dir1));
  if (digitalRead(dir1) == 1){
    Serial.println("vers la droite");
    vitesse_gauche -= i; //Pour touner vers la droite, il faut réduire la vitesse du moteur de gauche
    vitesse_droite +=i;
    Serial.print("vitesse droite ");
    Serial.println(vitesse_droite);
    Serial.print("vitesse gauche ");
    Serial.println(vitesse_gauche);
    analogWrite(M2A, vitesse_gauche);
    analogWrite(M1A, vitesse_droite);}
```

Cartographie avec ROS

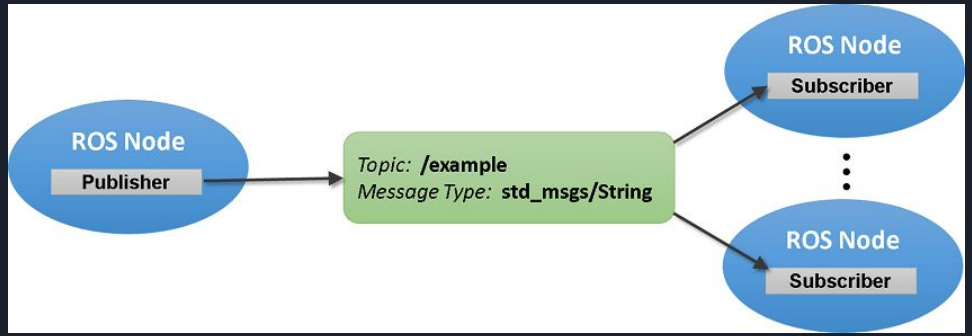
ROS.org

Robot Operating System

Ensemble de logiciels open source

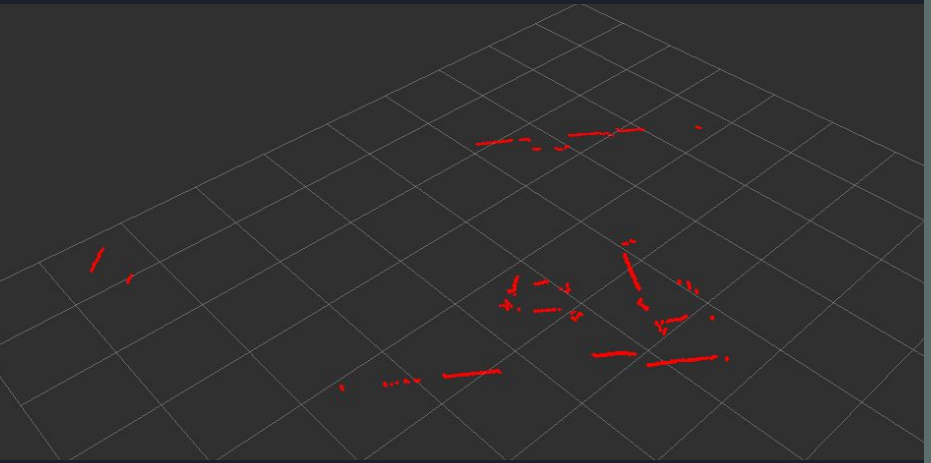
Permet de diviser les tâches entre Nodes contrôlées par un maître.

-meilleure gestion mémoire et du matériel

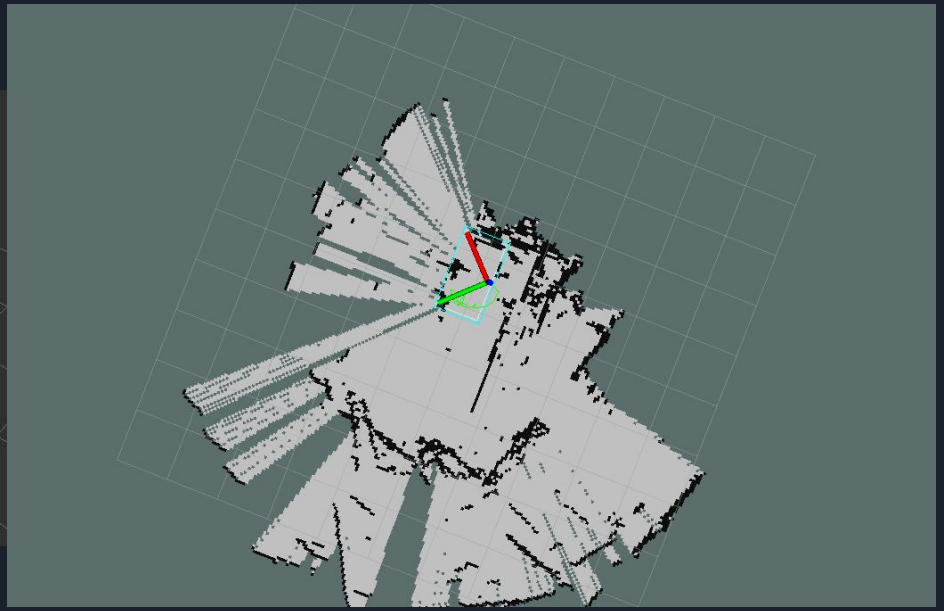


Cartographie avec ROS

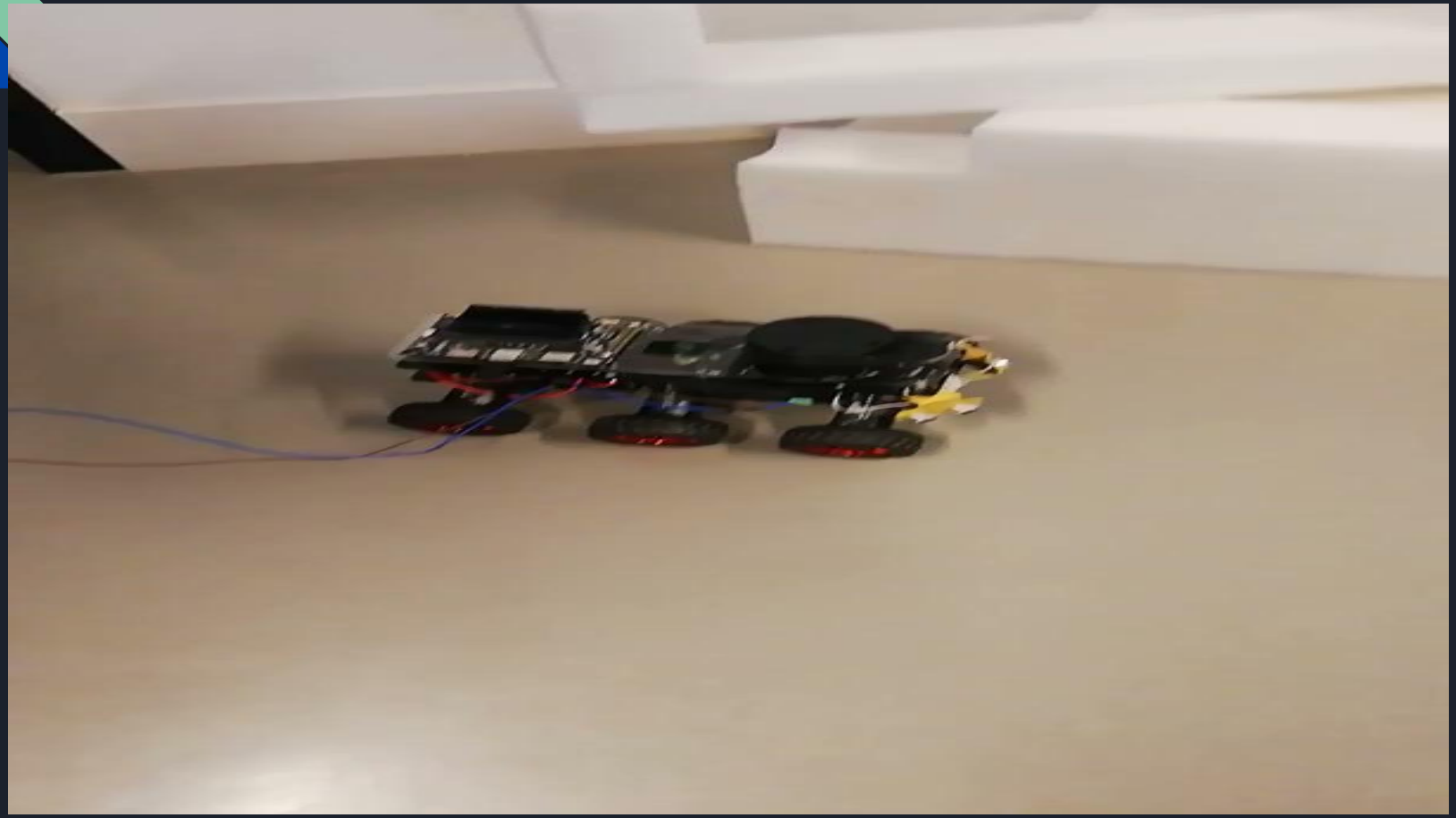
Sans SLAM

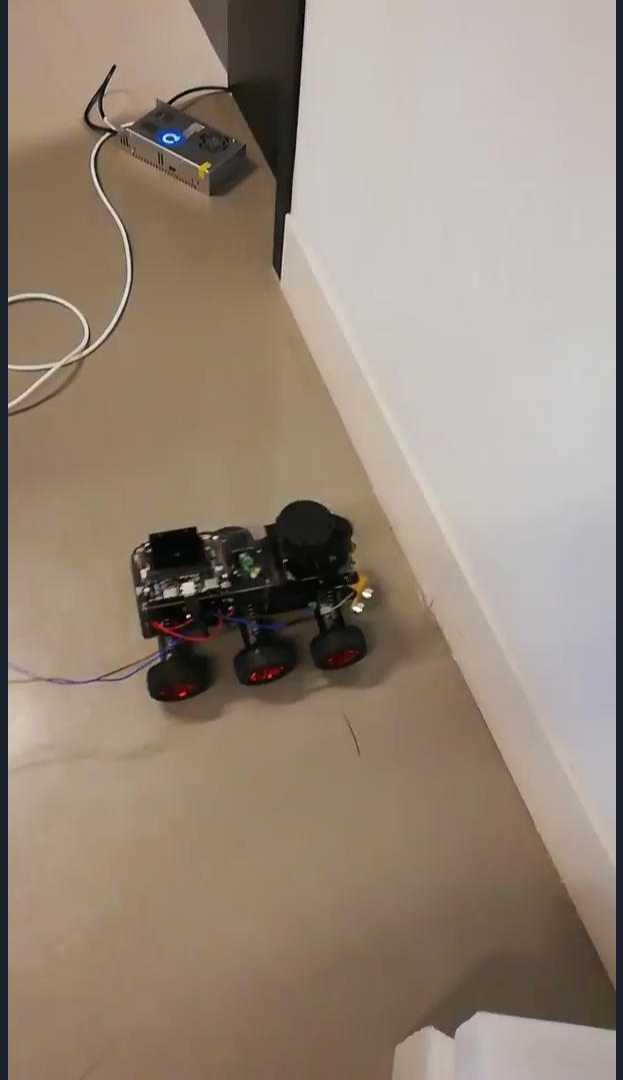


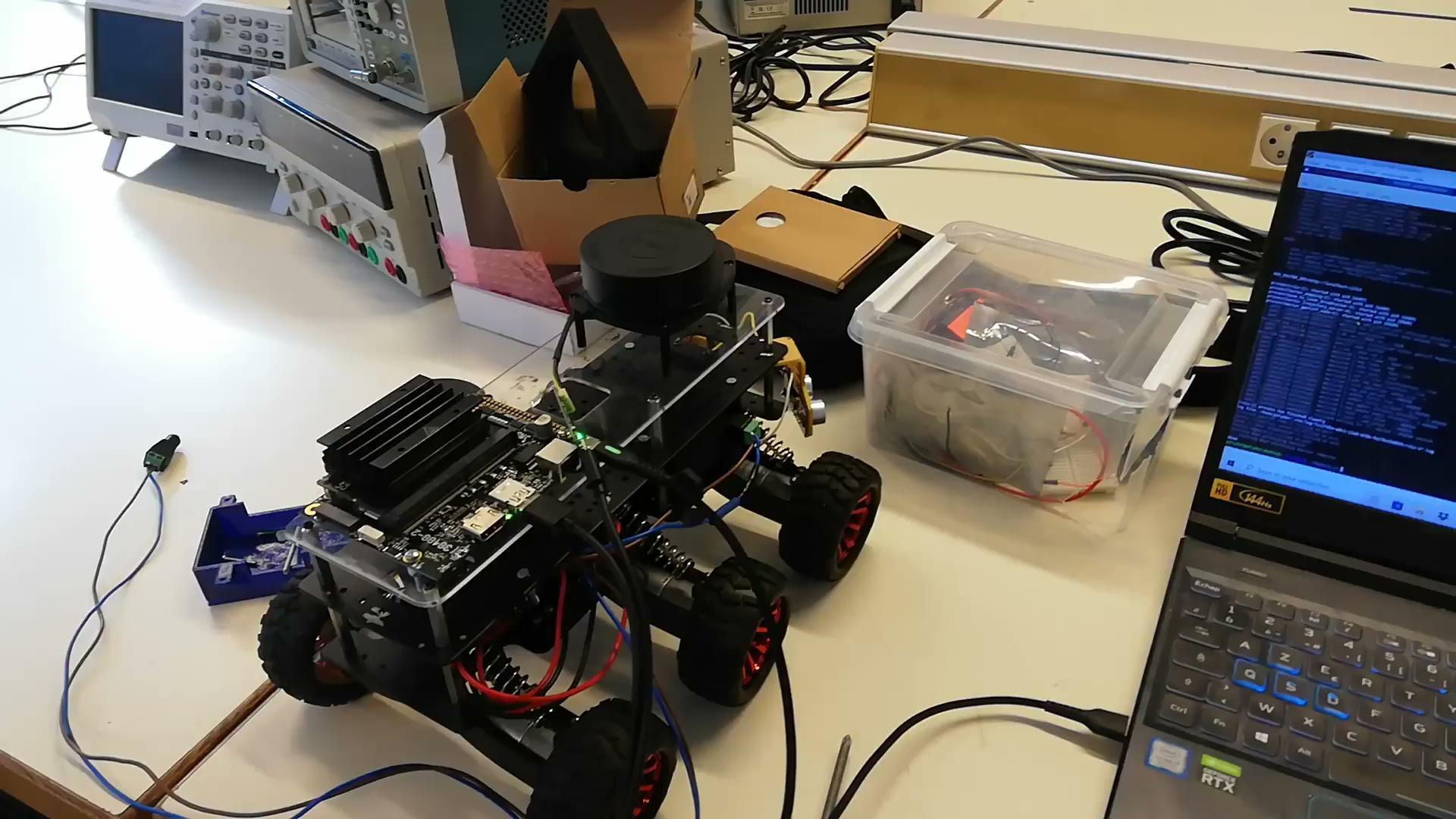
Avec SLAM



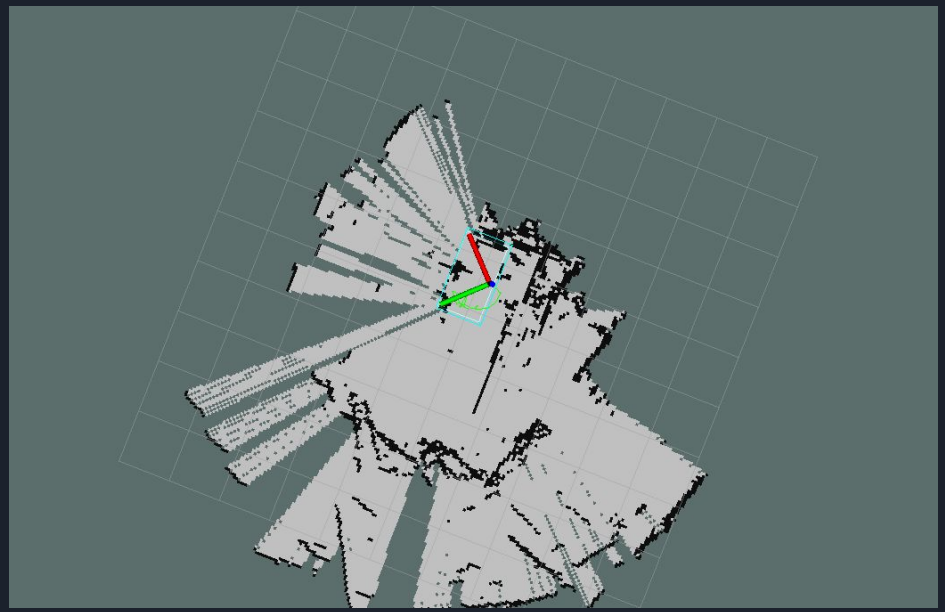
DEMO



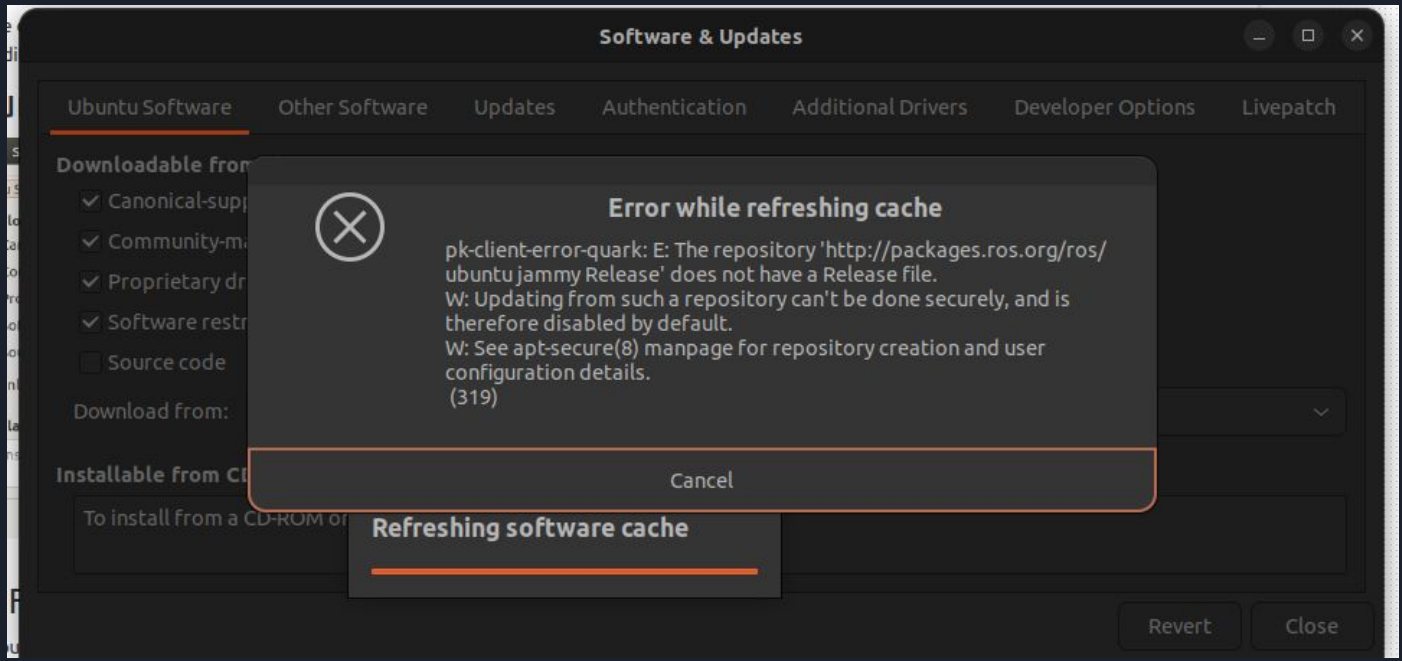




PB1 :
lidar 2d

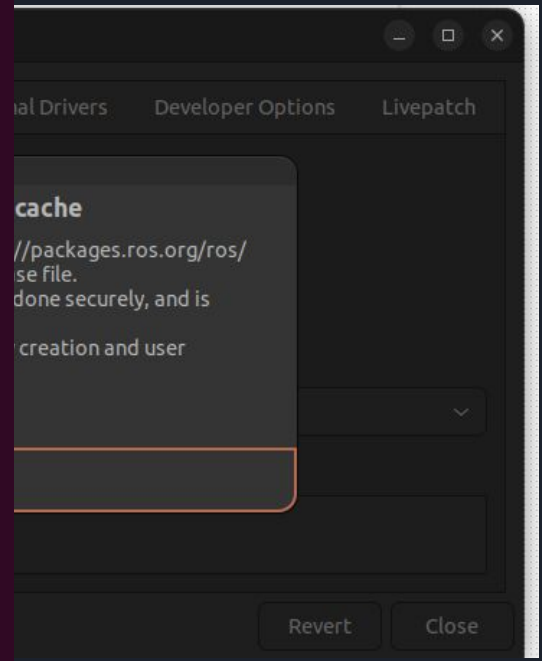


PB 2 : ROS


Software & Updates
Ubuntu Software
Other Software
Updates
Authentication
Additional Drivers
Developer Options
Livepatch
Downloadable fro
Canonical-sup
Community-m
Proprietary dr
Software restr
Source code
Download from:
Installable from C
To install from a CD-ROM o
Error while refreshing cache
pk-client-error-quark: E: The repository 'http://packages.ros.org/ros/ ubuntu jammy Release' does not have a Release file.
W: Updating from such a repository can't be done securely, and is therefore disabled by default.
W: See apt-secure(8) manpage for repository creation and user configuration details.
(319)
Cancel
Refreshing software cache
Revert
Close

PB 2 : ROS

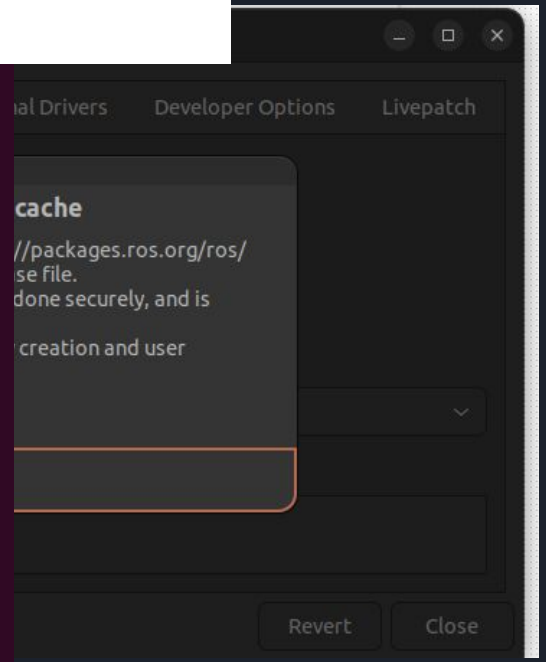
```
 * /move_base/local_costmap/transform_tolerance
 * /move_base/local_costmap/unknown_threshold
 * /move_base/local_costmap/update_frequency
 * /move_base/local_costmap/width
 * /move_base/local_costmap/z_resolution
 * /move_base/local_costmap/z_voxels
 * /move_base/planner_frequency
 * /rosdistro
 * /rosversion

NODES
  /
    amcl (amcl/amcl)
    map_server (map_server/map_server)
    move_base (move_base/move_base)

ROS_MASTER_URI=http://localhost:11311

core service [/rosout] found
process[map_server-1]: started with pid [4794]
process[amcl-2]: started with pid [4811]
process[move_base-3]: started with pid [4899]
[ERROR] [1409879178.341364332]: Couldn't transform from laser to base_footprint,
 even though the message notifier is in use
[ERROR] [1409879178.341549427]: Couldn't transform from laser to base_footprint,
 even though the message notifier is in use
[ERROR] [1409879178.341661648]: Couldn't transform from laser to base_footprint,
 even though the message notifier is in use
[ERROR] [1409879178.341767173]: Couldn't transform from laser to base_footprint,
 even though the message notifier is in use
[ERROR] [1409879178.441365050]: Couldn't transform from laser to base_footprint,
 even though the message notifier is in use
[ERROR] [1409879178.441516527]: Couldn't transform from laser to base_footprint
```



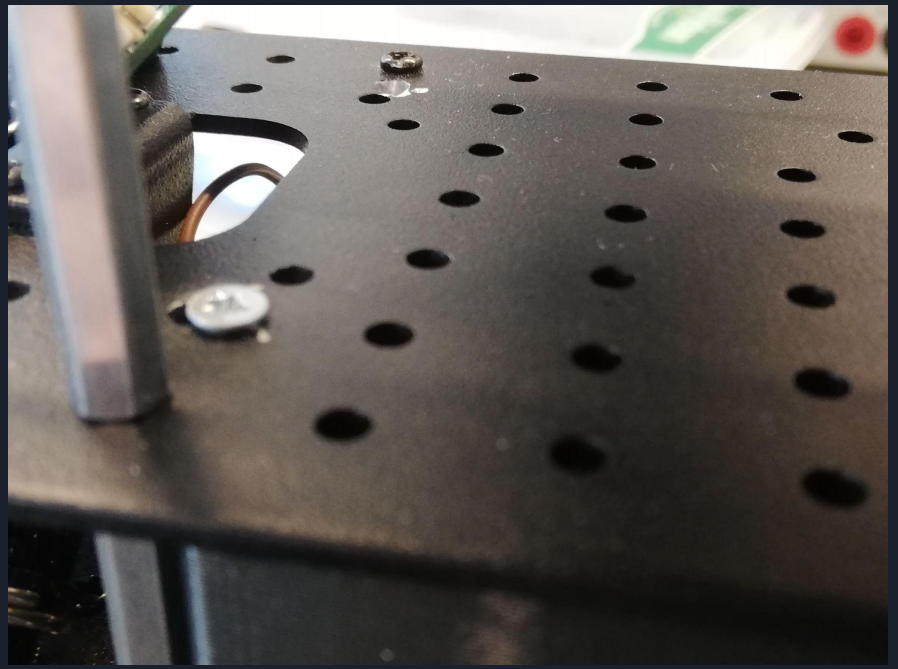
PB

#2 The ROS node process has died

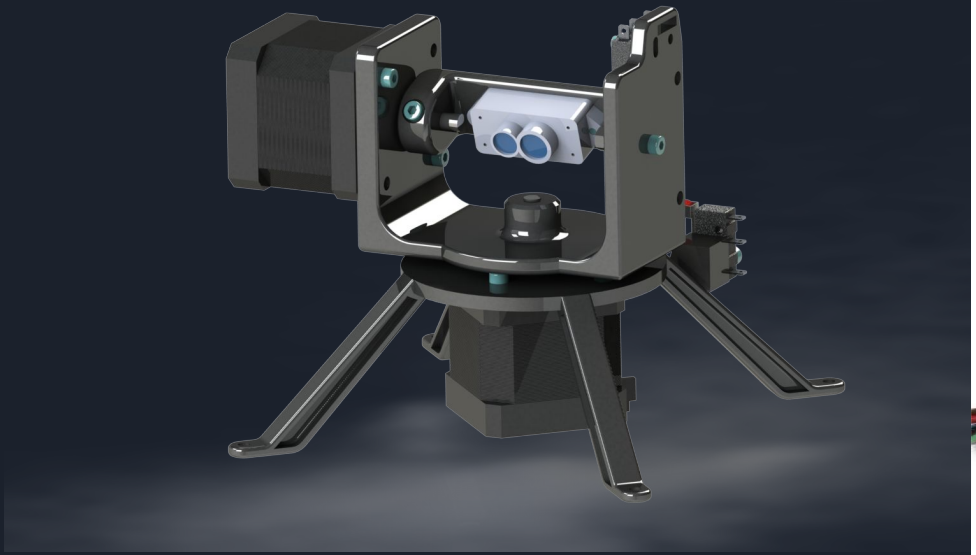
```
 * /move_base/local_costma
 * /move_base/local_costma
 * /move_base/local_costma
 * /move_base/local_costma
 * /move_base/local_costma
 * /move_base/local_costma
 * /move_base/planner_fre
 * /rosdistro
 * /rosversion

NODES
  /
    amcl (amcl/amcl)
    map_server (map_server/map_server)
    move_base (move_base/move_base)

ROS_MASTER_URI=http://localhost:11311

core service [/rosout] found
process[map_server-1]: started with pid [4794]
process[amcl-2]: started with pid [4811]
process[move_base-3]: started with pid [4899]
[ERROR] [1409879178.341364332]: Couldn't transform from laser to base_footprint,
 even though the message notifier is in use
[ERROR] [1409879178.341549427]: Couldn't transform from laser to base_footprint,
 even though the message notifier is in use
[ERROR] [1409879178.341661648]: Couldn't transform from laser to base_footprint,
 even though the message notifier is in use
[ERROR] [1409879178.341767173]: Couldn't transform from laser to base_footprint,
 even though the message notifier is in use
[ERROR] [1409879178.441365050]: Couldn't transform from laser to base_footprint,
 even though the message notifier is in use
[ERROR] [1409879178.441516527]: Couldn't transform from laser to base_footprint
```

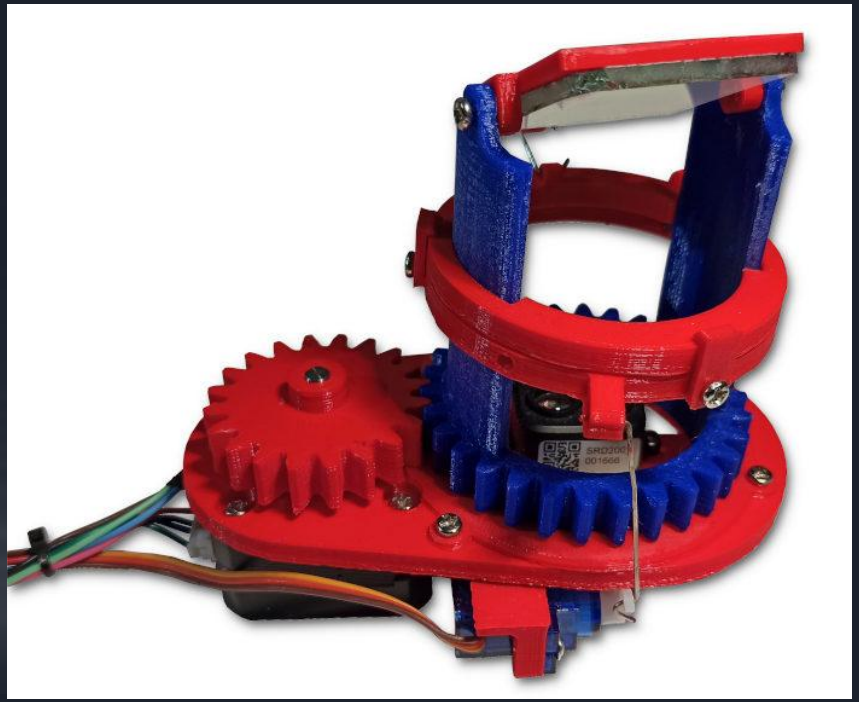


PB 3: le châssis

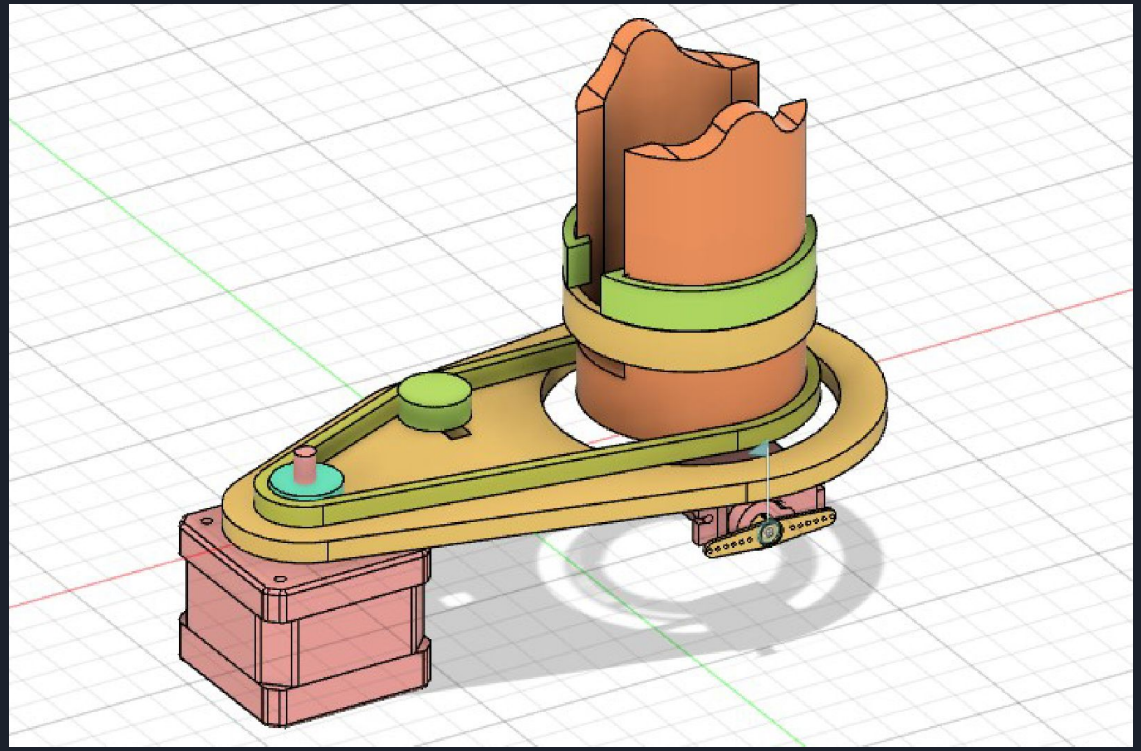


Choix du type de lidar

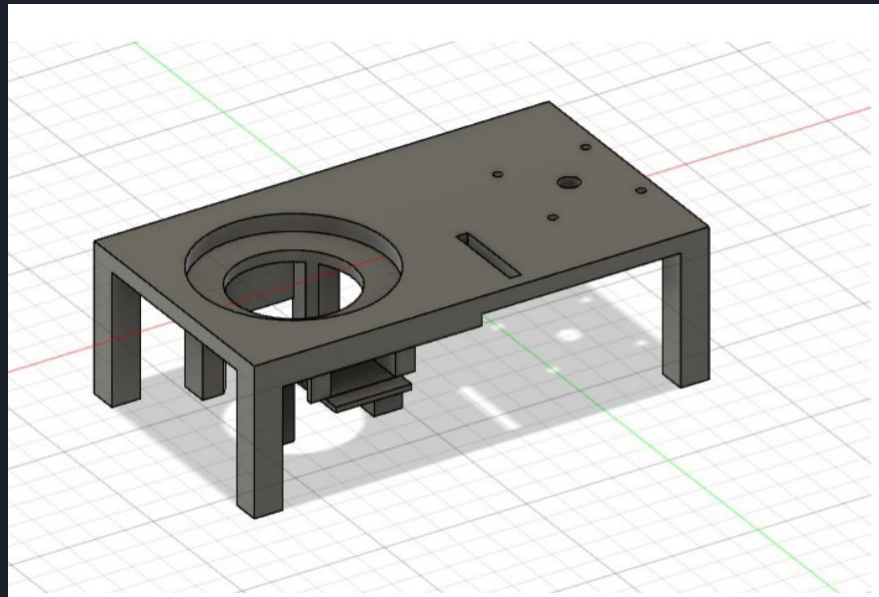


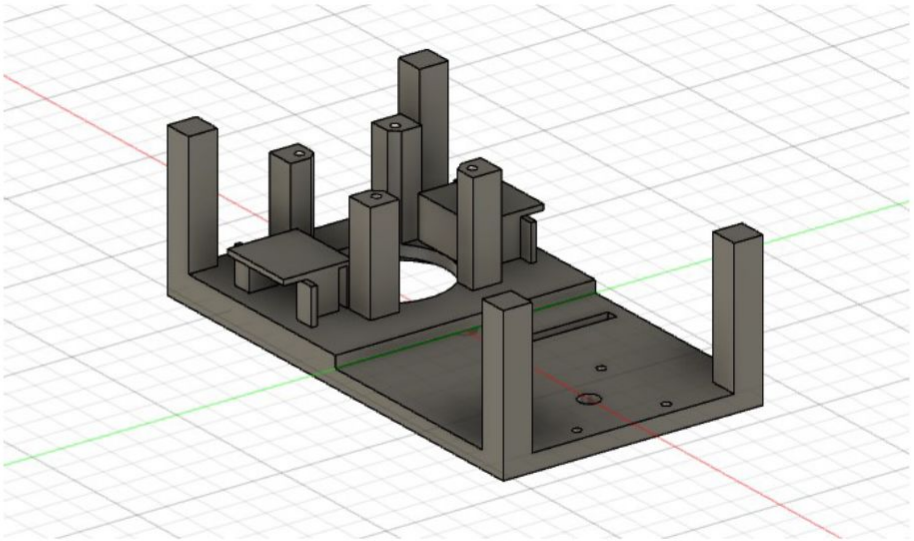


Prototype initial

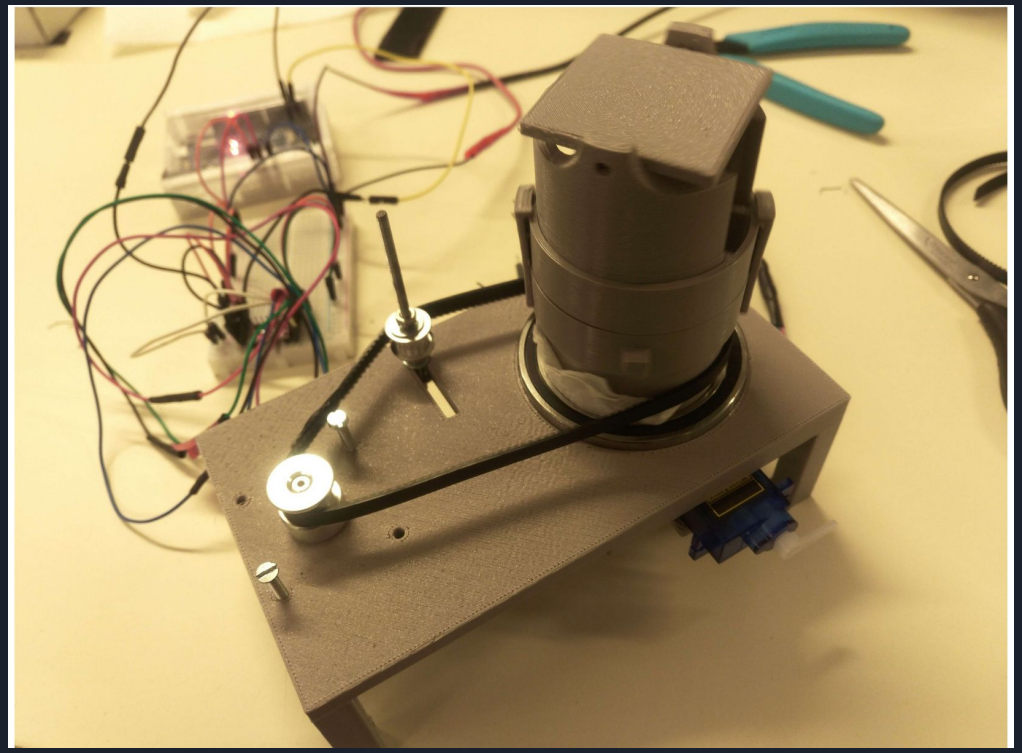


Mis à jour du design

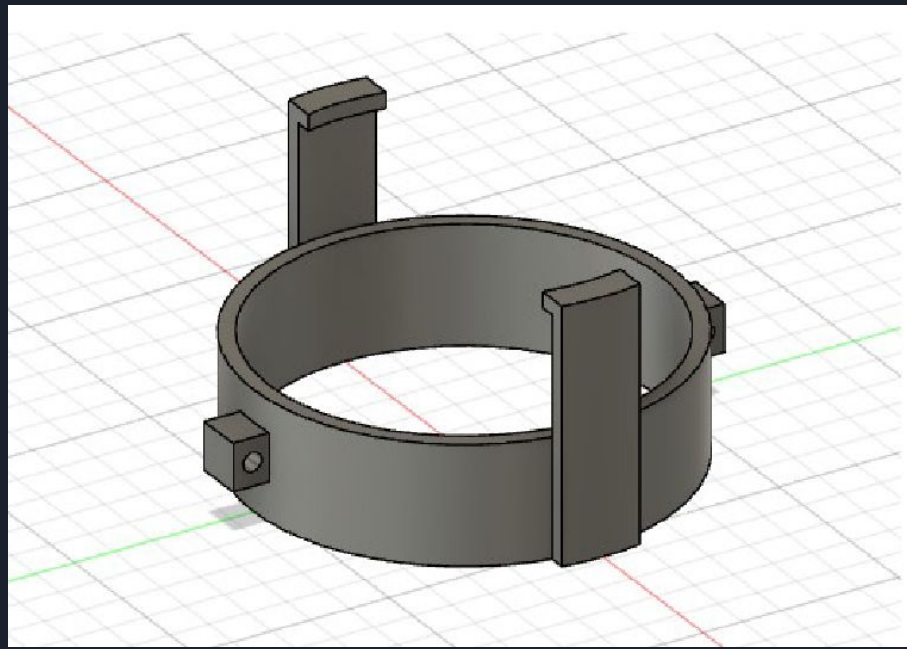


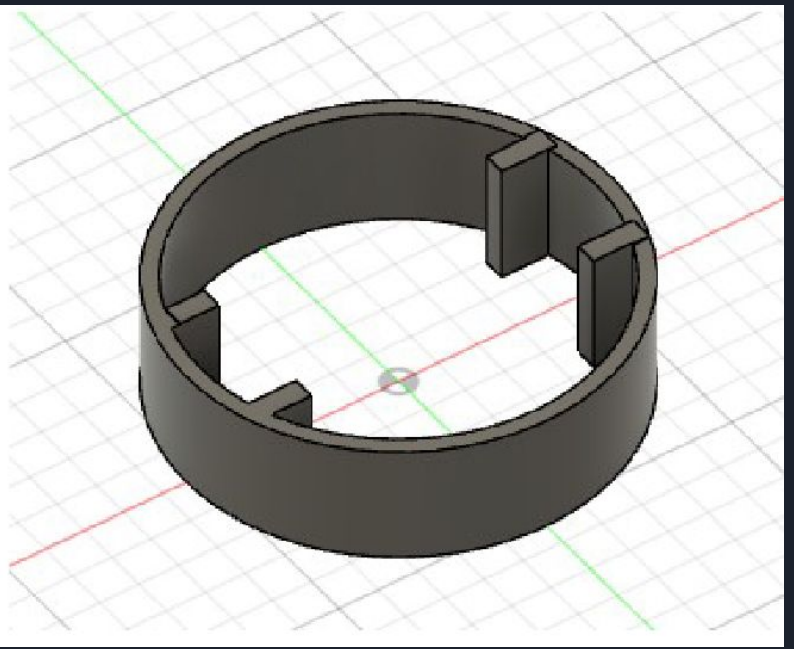


Mis à jour du design

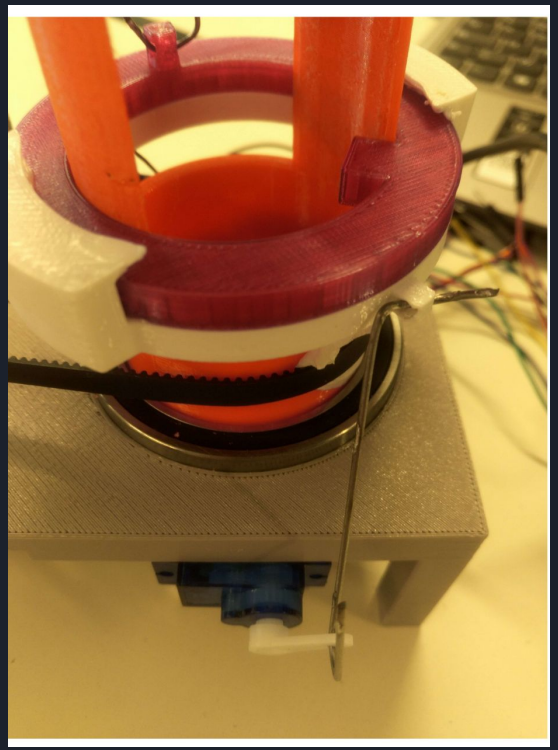


Correction des erreurs

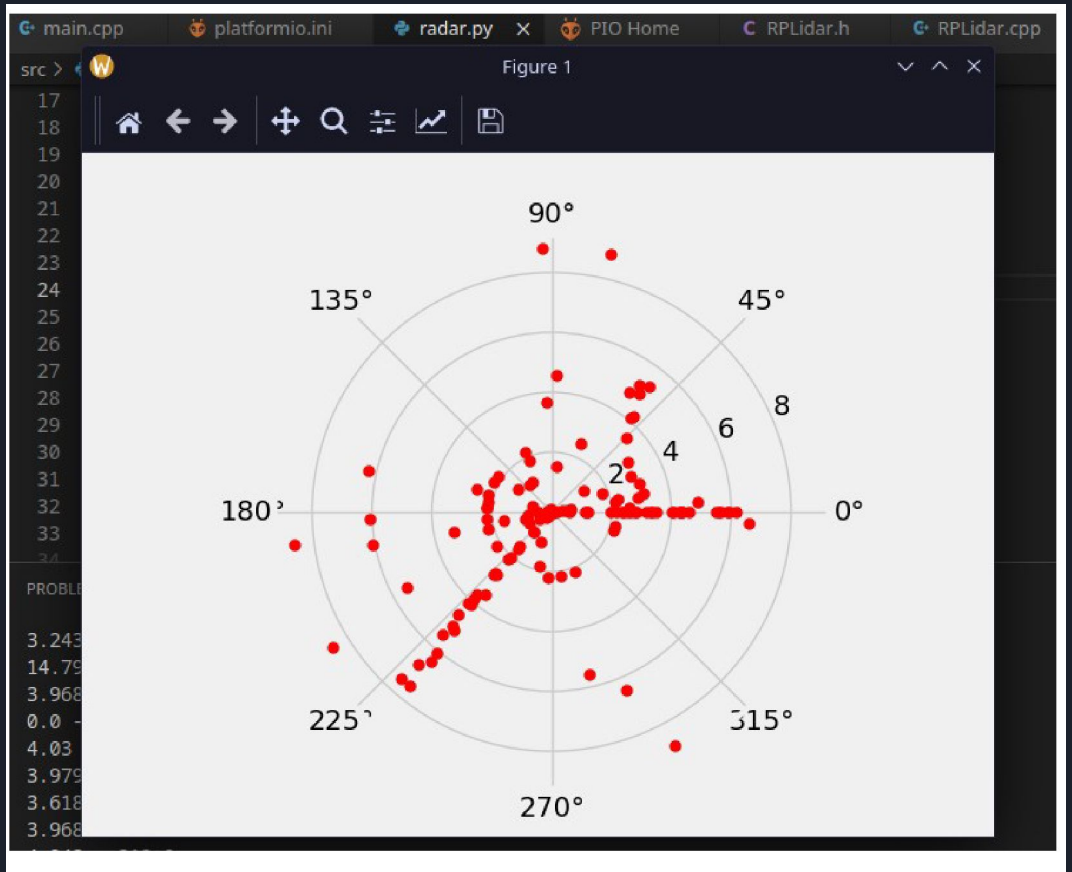




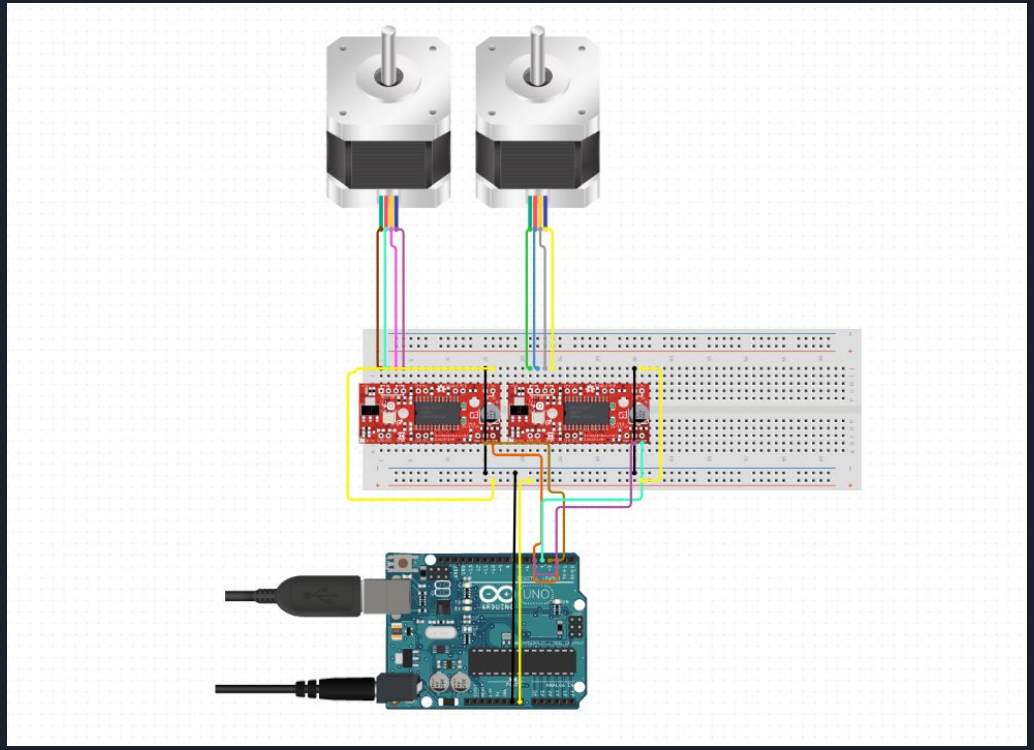
Nouveaux problèmes



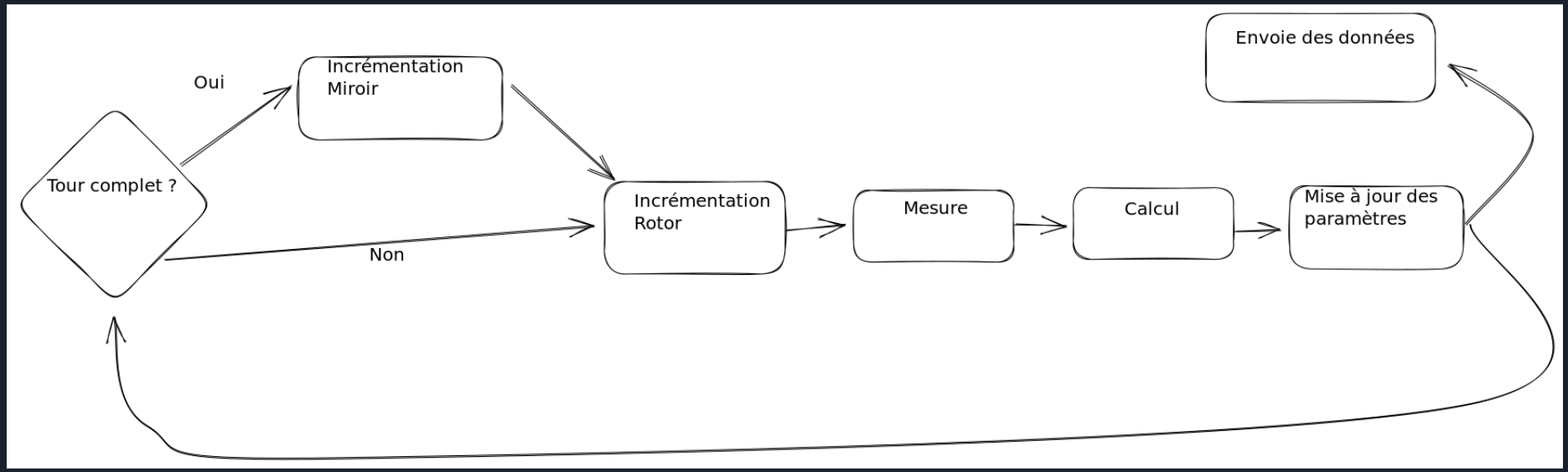
Visualisation des données



Cablage LIDAR



Programmation LIDAR



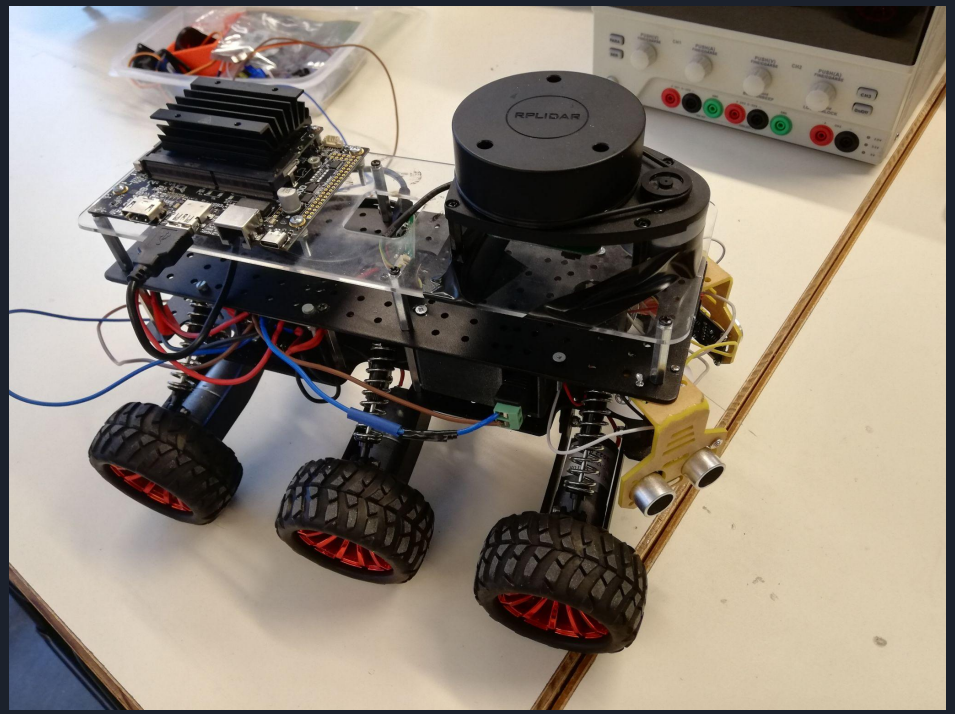
Conclusion et perspectives d’améliorations

-navigation avec ROS

-intégration du Lidar sur le châssis

- finir notre propre châssis

- finir notre propre Lidar




MERCI
pour votre attention
Avez-vous
des questions ?