Midterm Presentation

TIAgo pmb2

Davide Morelli, Sophie Maudonnet

Project

- Cat carer
  - → Cares about your cat when you are away
  - → Can have multiple features:
    - Cat feeder: (options to recognize different cats – identification → monitor amount of food for each cat)
    - Pets your cat
    - Screen interface to communicate with you cat and check on it
    - Litter cleaning

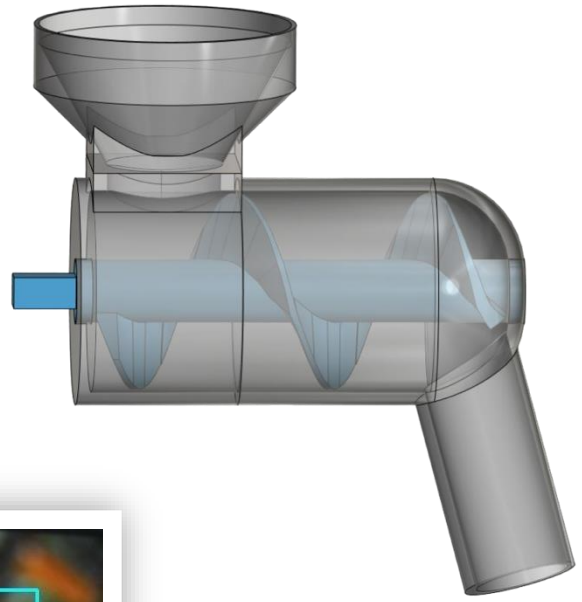
Refined concept

- Prototype implementing the feeder part:
  - Detection of cat non-distinctively using a camera and ML
  - Feeder (dry food)
  - NodeRED interface to move the robot around in a previously mapped space

Prototype

- Cat feeder: 3D printed
  - Model found online:

    https://www.thingiverse.com/thing:688807/files



- Cat recognition
  - ML pretrained model:

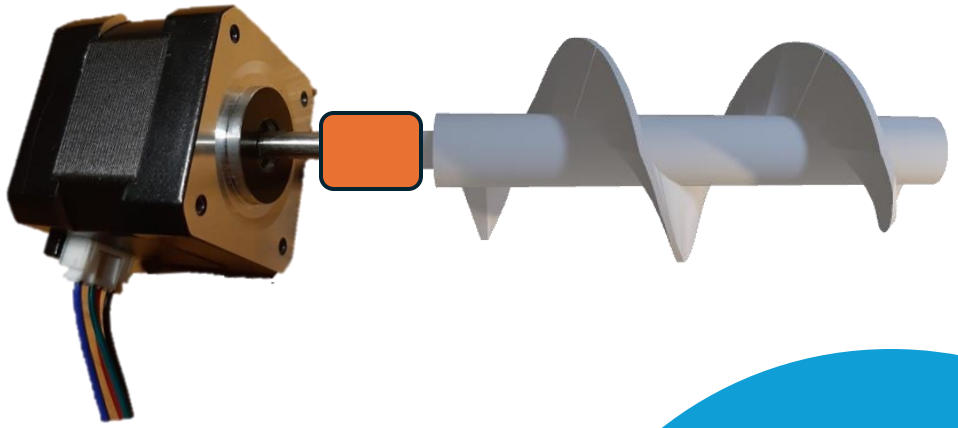
    →dog/cat detection using YOLO - You Only Look Once


```
Application started
Model loaded
Video capture loaded
Cat detected
```

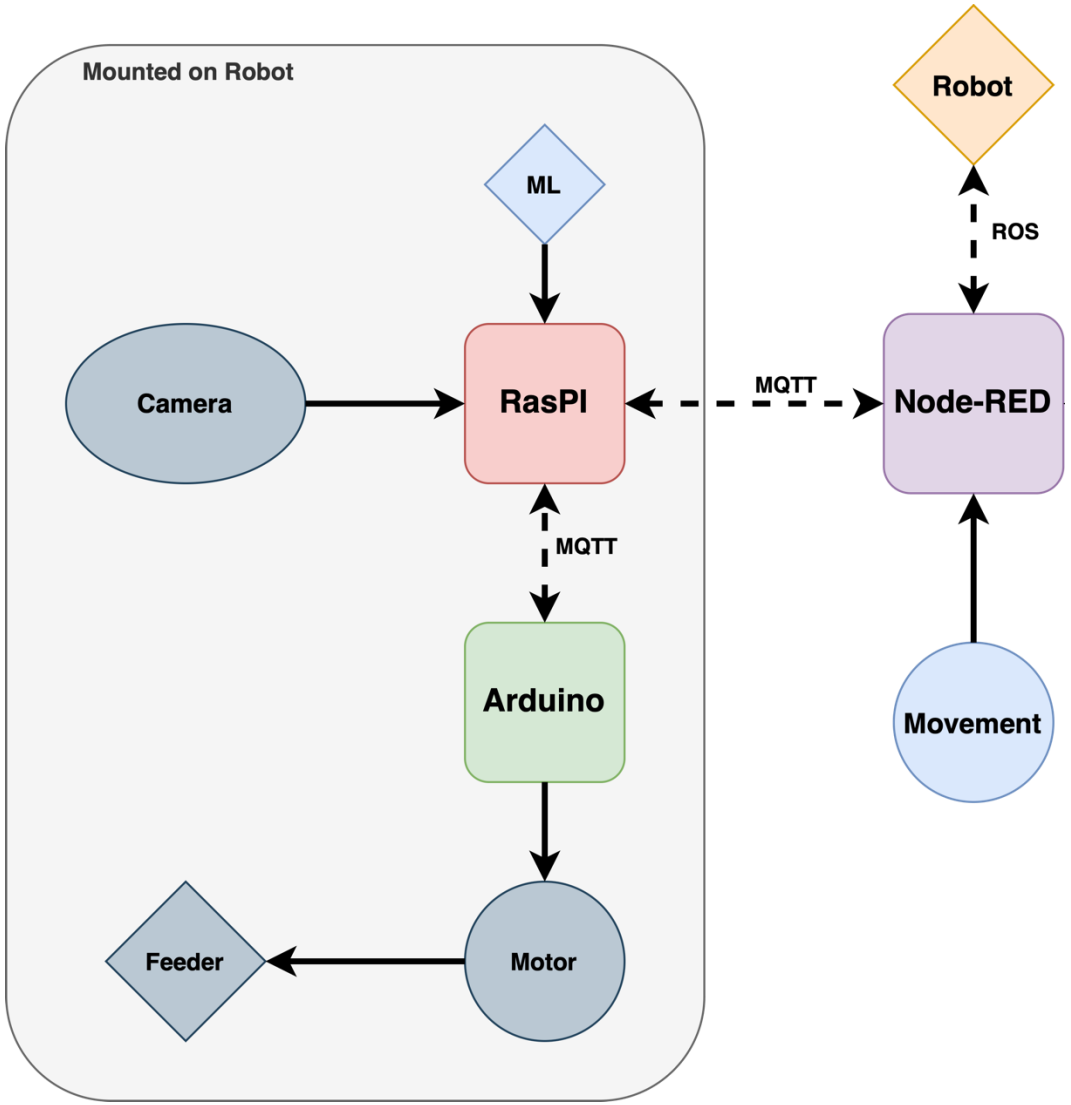
Required sensors/actuators

- Camera → RasPi

- Stepper motor:
  - →Requires to design and print a 3D piece adapter between motor and feeder screw
  - →Styrofoam support for feeder and motor



Architecture



Plan

- Camera and ML ✅
- Feeder printing (small-test and normal version) ✅ + Arduino code
  →Make adaptor for motor ✅ + Styrofoam support
- Node-RED interface implementation for travelling + rviz
- Connection of all elements (GUI, RasPi, Arduino, feeder, camera) + docker on RasPi

If enough time:

- Implement a way to attract the cat's attention (3D printed food shaker to activate from the GUI)
- "Automatic mode" for letting the robot travel autonomously