HW Meeting
2024-09-09

Intro

- Har alla en ungefärlig idé om hur roboten ska byggas?
  - Komponenter, struktur etc

Areas for hardware

- Initial idé om indelning för hårdvara där vi kan läsa in oss djupare för att hitta bra stöd från litteraturen och kan gör ett utbildat val för respektive komponent.

Processing Unit

- Varje robot kommer behöva sin egna processor för att kunna köra AI, kommunicera genom RF/ROS2.
- Input från sensorer
  - En ADC kan kopplas innan ifall Raspberry pi används. T.ex. Pico eller extern ADC.
- Sammarbete med Software (SW)
- Programmering med ROS2/C++

Communication

- Robotarn måste kunna kommunicera med varandra och med en extern datorn.
- Hur ska denna kommunikation se ut, vilken form etc.
  - E.g. Radio frequency (RF)
  - Bluetooth är ej tillåtet.
  - Wi-Fi

Battery management

- All the components will require power
- This group should create protection circuitry for the batteries, provide the correct voltage for the other components
  - Processing unit might require 5V and motor 12V
- Electrical design
  - Multisim or Eagle CAD can be used

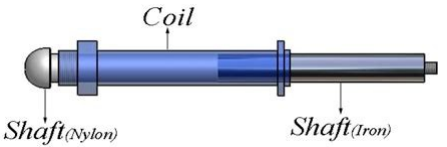
Motor control

- Decide which type of motors that should be used
  - Roller
  - Wheels
- Motor controller such as H-bridges
  - Can be designed or purchased as is depending on motor
- Electrical engineering

Kicker

- The kicker should most probably be a solenoid, and a electric schematic will be necessary for this.
- Decide which solenoid to be used
- 3D design of the kicker
  - Ideally it should be able to pass and chip the ball

- Electrical engineering
- CAD



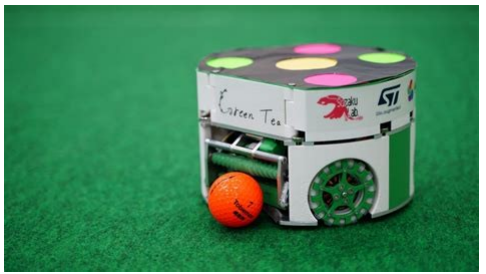
Wheels

- Decide what type of wheels we should use and how many wheels.

- Physics

3D design of the robot body

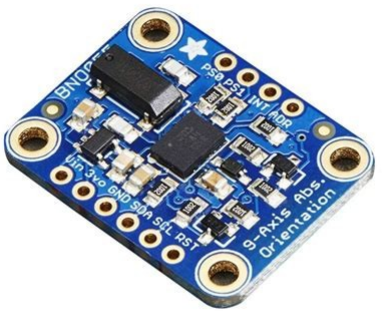
- Initial 3D design of the robot
- CAD



Sensors

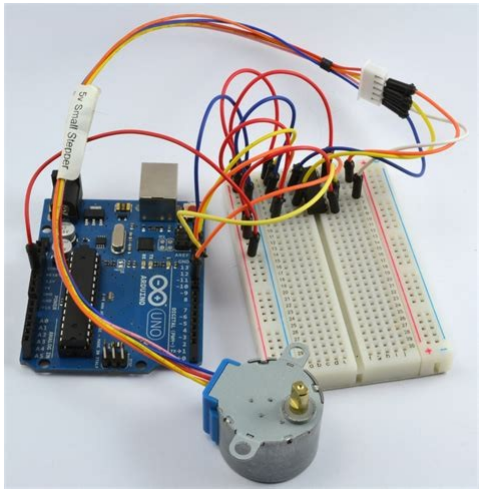
- Decide what type of sensor we should use for detecting other robots, position of the robot etc
  - IMU
  - IR
  - Ultrasonic

- Sensor knowledge



Develop a testing environment

- We will need a standardized way to calibrate the robot, a way to validate that the robot behaves as we say it does and that the stakeholders requirements are met
  - Real-time monitoring tools
    - MyDAQ
    - LabView



Documentation

- Each component used should be described in its own section on the hardware page WIKI
- I will add more information about how this should be done

Additional

- Additional training to access the battery cabinet
  - 2024-09-16 (1 week from now)
- PRO1 – 2024-09-27
  - 18 Days (2 weeks)
- Develop our plan for the hardware (Ideally a draft at the end of the week)
  - Decide which components to use
  - Cost
- I will create more detailed instructions for each group and add more requirements