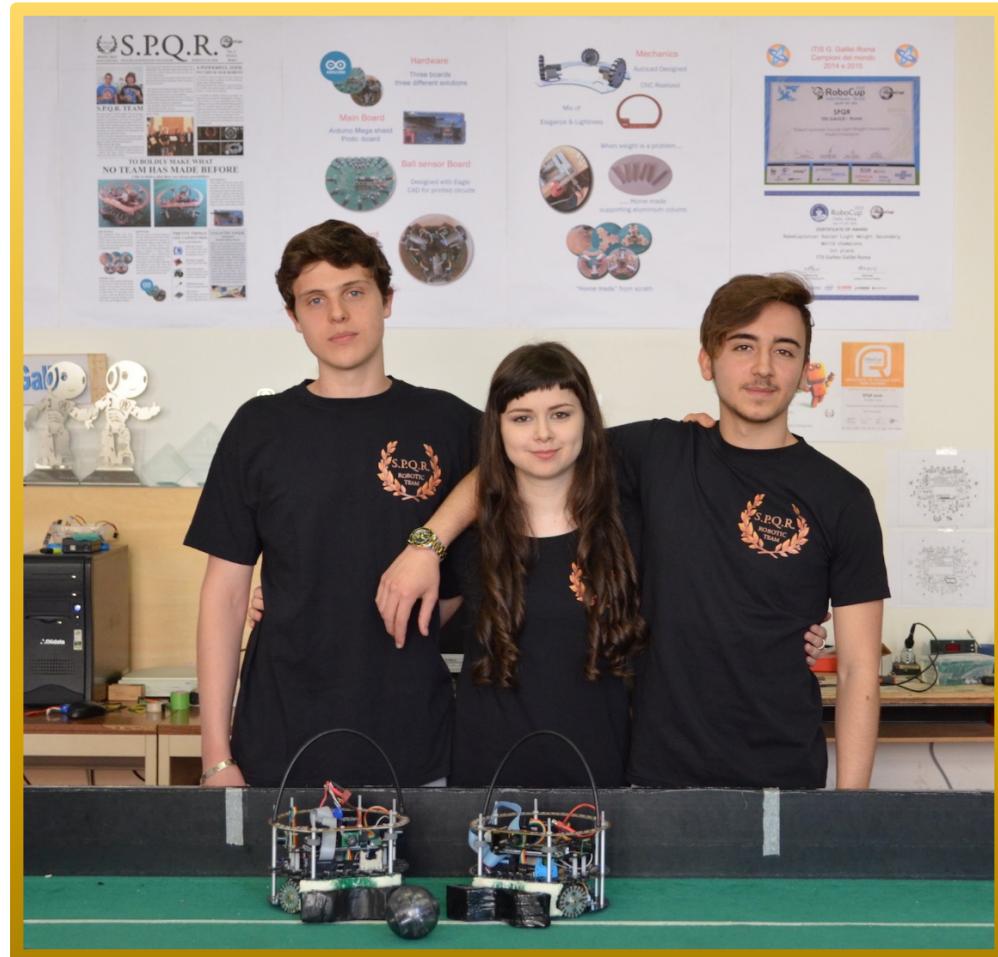


S.P.Q.R. Team



ITIS Galileo Galilei Rome

S.P.Q.R. Team



- Name: Enrico Di Claudio
- Age: 17
- Role: Hardware
- Note: cyclist, electronics, sport



- Name: Giulia De Iulis
- Age: 18
- Role: Electronics
- Note: fond of astronomy, reading, piano



- Name: Flavio Galasso
- Age: 17
- Role: Software
- Note: hacker, music composer, gymnast

Year 2016
representatives



S.P.Q.R. Background

We are students of “Automation”

We are part of the team since 2014.



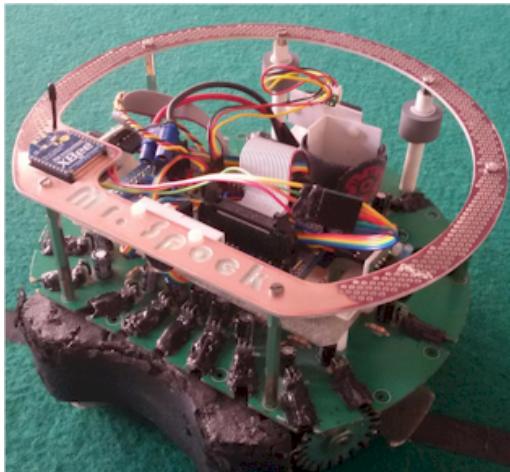
SPQR Robocup Junior Soccer Light weight Placements

- 2012: 1° place RomeCup, 1° place AustrianOpen 3° place super Team Mexico
- 2013: 1° place RomeCup, 1° place AustrianOpen, Best Teamwork Heindoven
- 2014: 1° place RomeCup, 1° place AustrianOpen, World Champions Brasil
- 2015: 1° place RomeCup, 2° place AustrianOpen, world champions Hefei (China)
- 2016: 1° place RomeCup, 2° place AustrianOpen

Robot generation 2015



United Federation of Robots

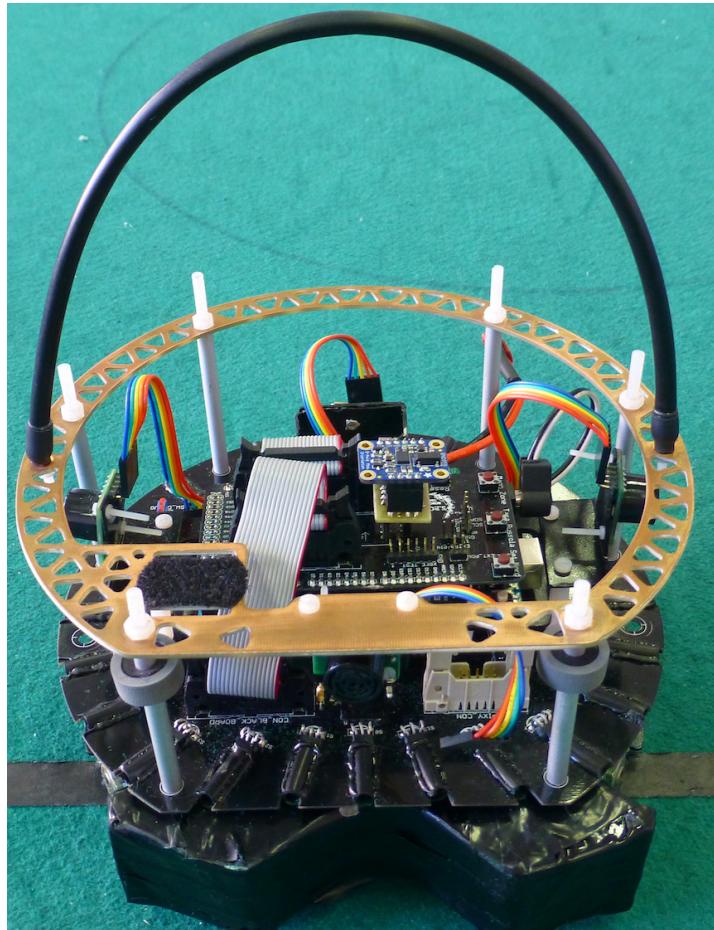


- Name: Mr. Spock
- Age: 1 year
- Role: goal keeper



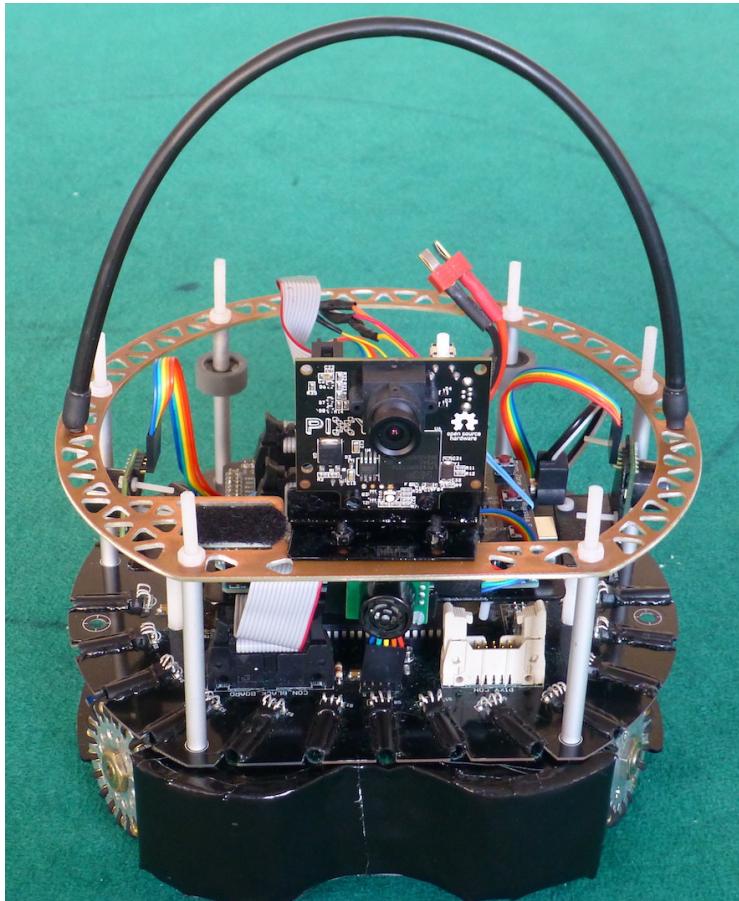
- Name: J. T. Kirk
- Age: 1 year
- Role: goalie

Completely redesigned 2016 new generation



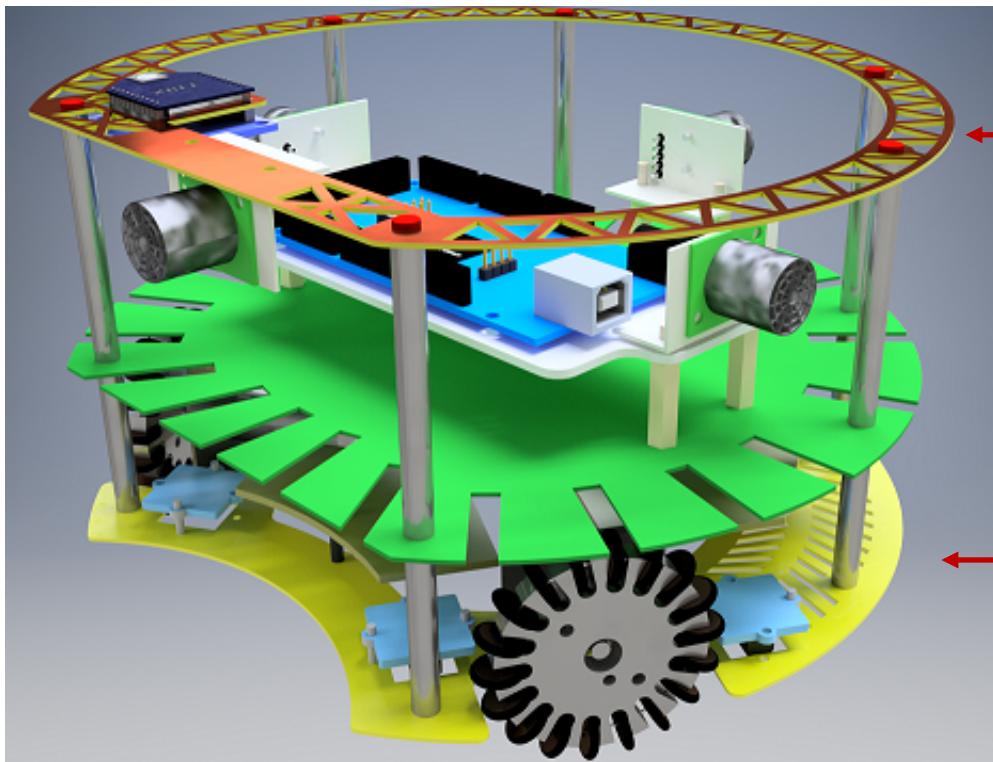
- Name: Salvador
- Age: just born
- Role: goal keeper
- Electronics: New boards, IMU, line sensors
- Mechanics: New CAD design, handle and columns
- Software: New strategy

Completely redesigned 2016 new generation



- Name: Manfreus
- Age: just born
- Role: goalie
- Electronics: New boards, IMU, line sensors, Pixy
- Mechanics: New CAD design, handle and columns
- Software: New strategy

Hardware



Realized with our
CNC

Lightness &
Solidity
compromise

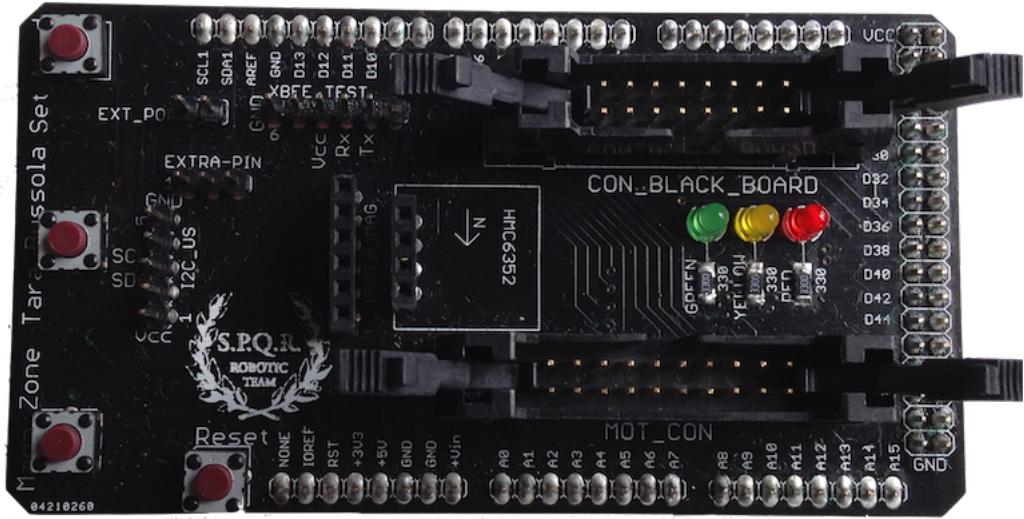
Three boards designed with Autocad & Eagle

Main Board



MEGA

New Arduino Mega Shield



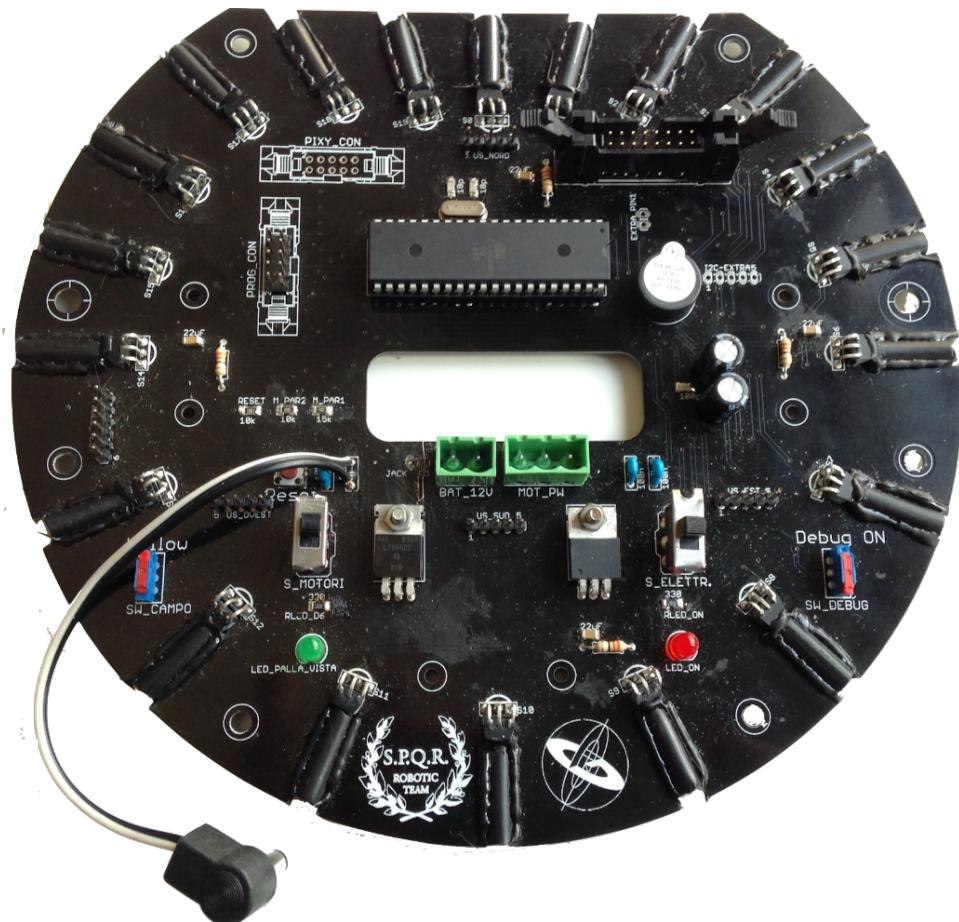
Links all boards to Arduino Mega

- Command buttons easily reachable and well placed
- Different sockets for different compasses
- Extra pins for expansion
- Signalising leds

Ball sensors Board

20 sensors for better ball identification

- Command switches set apart to avoid mistakes
 - Slave ATMega 644p SPI Connected to Arduino Mega
 - PIXY Connection

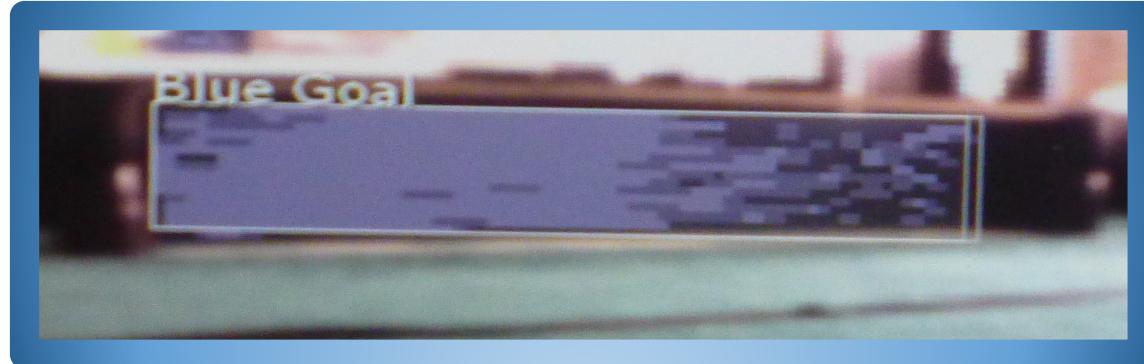


Motor Board

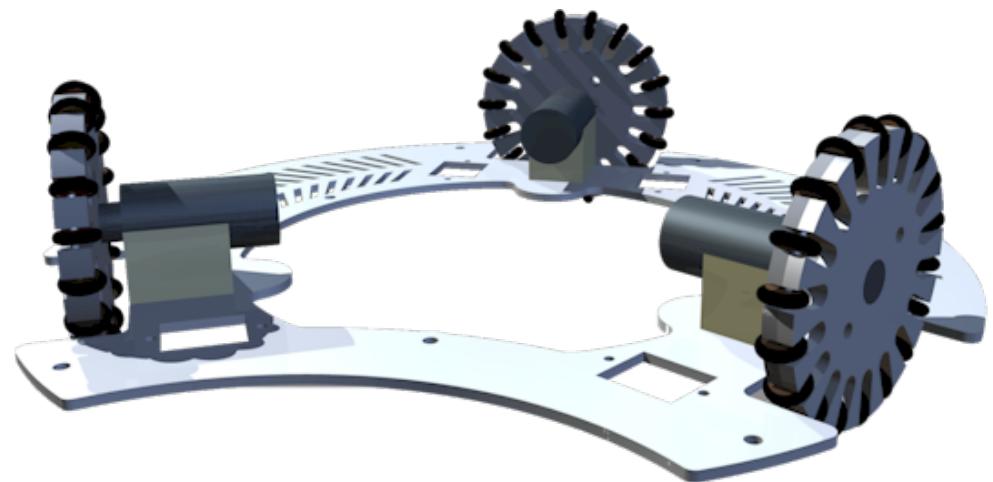
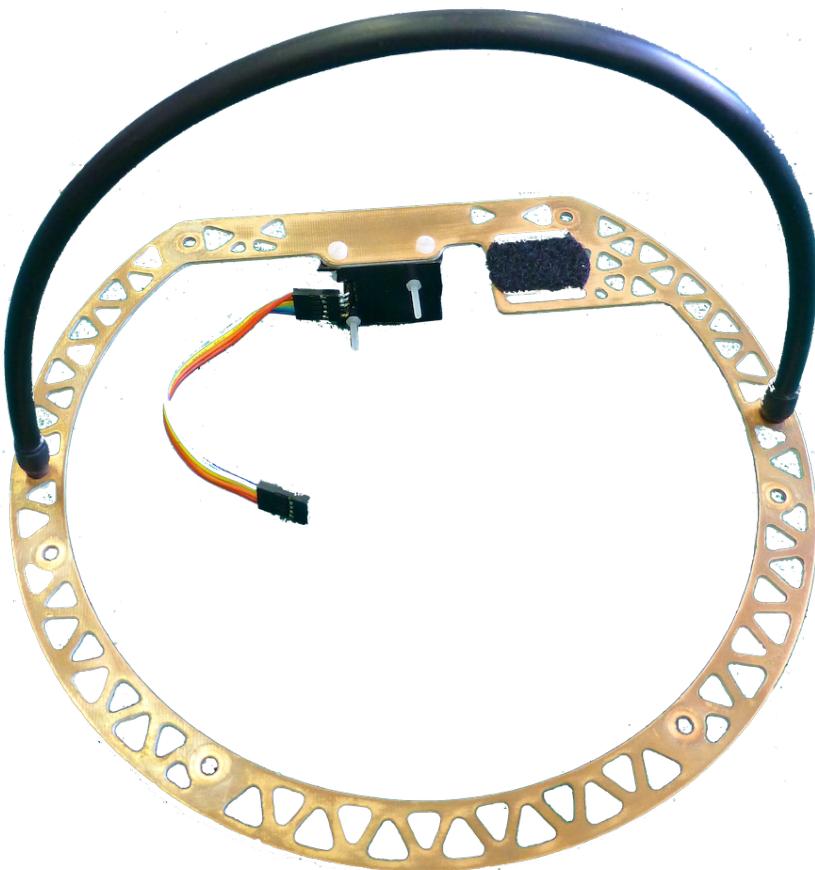
- 6 Line sensors PCINT connected
 - New line detection strategy
 - 3 Pololu VNH5019A



PIXY vision to detect the opponent goal



Mechanics



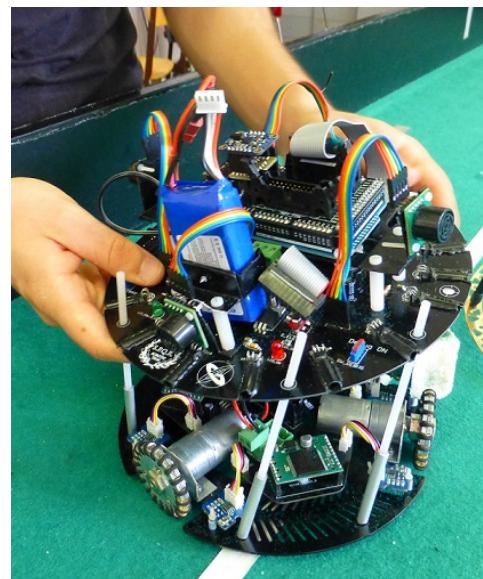
- Designed with Autocad
- CNC Realized
- Elegance and lightness mix

Easy access to all boards

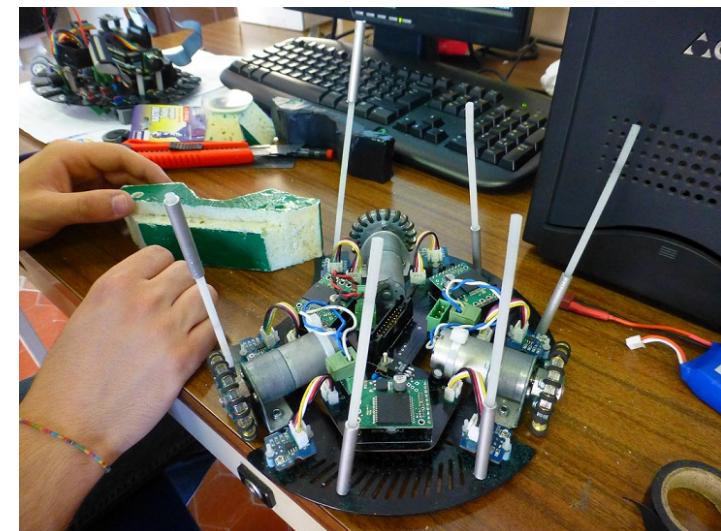
1. Take out the handle



2. Take out the ball board



3. Motor board ready



Nylon screws inside home made aluminium columns

Software



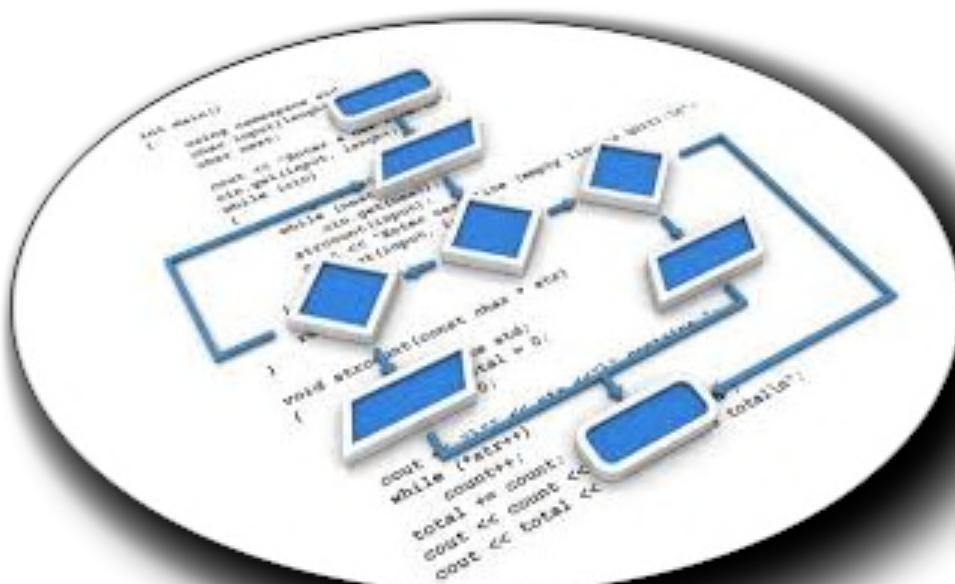
- The main board program is in Arduino C
- The ball sensor board program is in Arduino C
- The Debug Station program is in Processing

The two robots software aren't the same:

- The goalie tries to attack and score if it “sees” the ball
- The goal keeper moves forward only when the ball is near

Different software prevents robots from hinder each other

SW documentation



Comments



Flow Chart



SW making



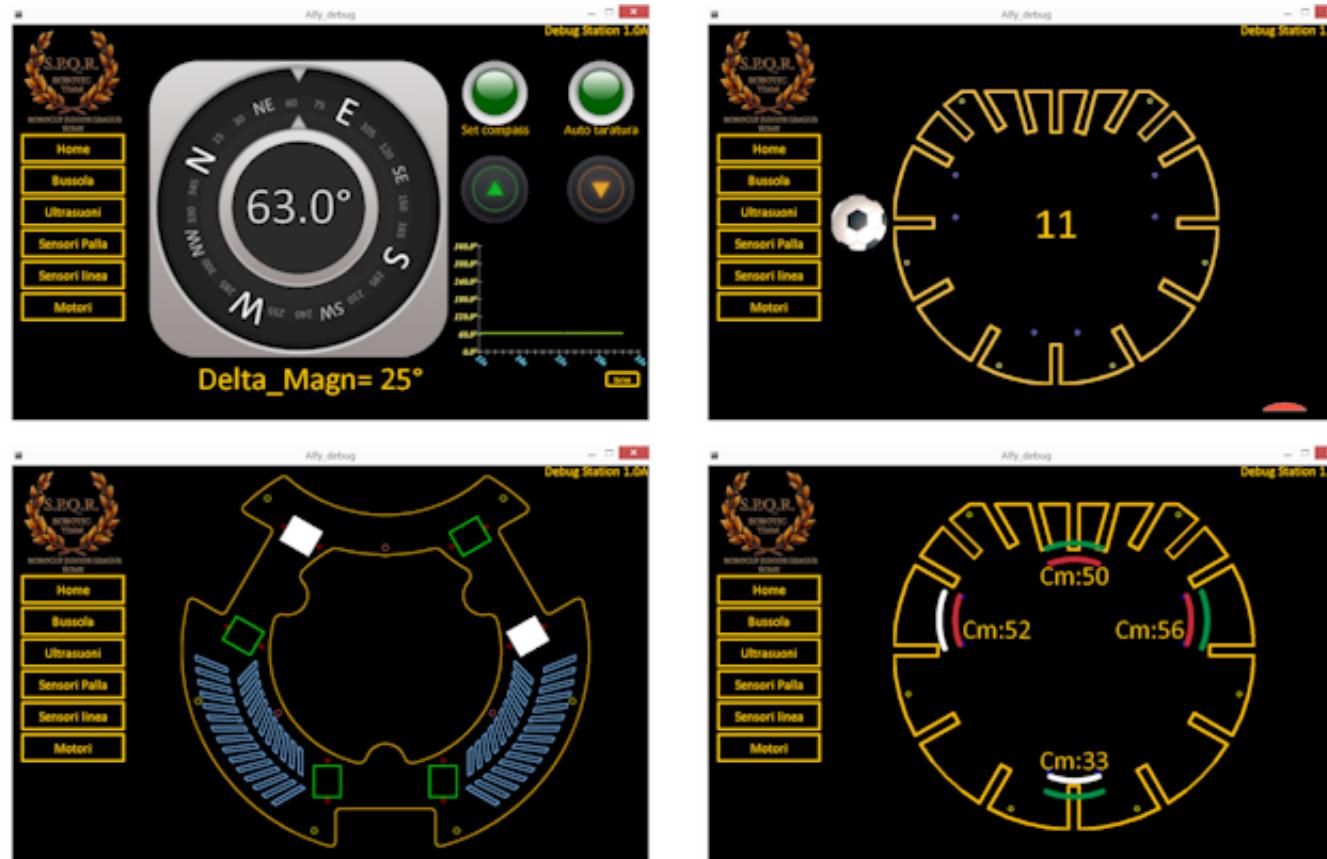
Modularity is the
key for a good
software

Debug Station



It allows us to check robot
hardware and software

Checking the sensors



A “Processing” test bed for our robots