

IIS PIAZZA DELLA RESISTENZA, 1 - MONTEROTONDO [RM]

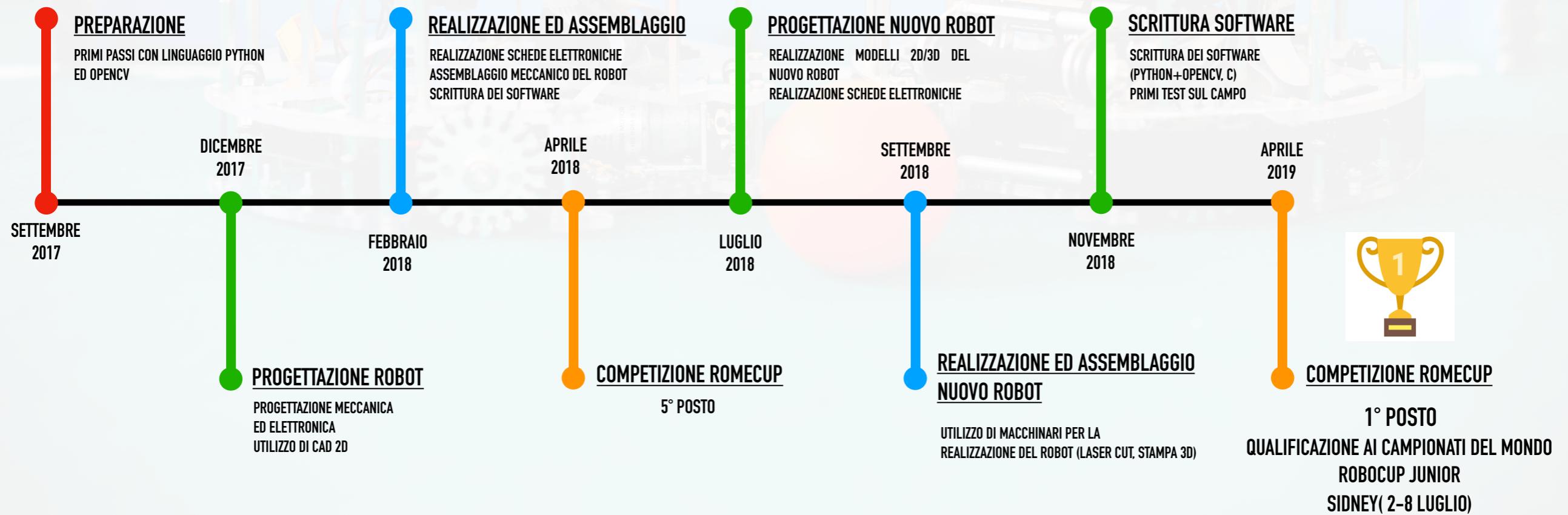
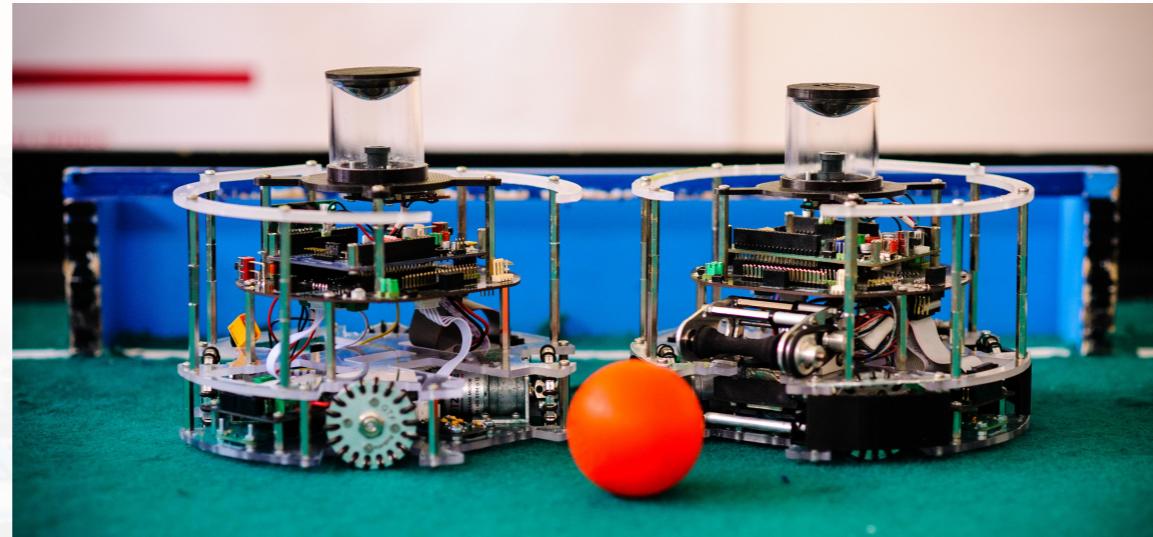
A.S. 2018/2019

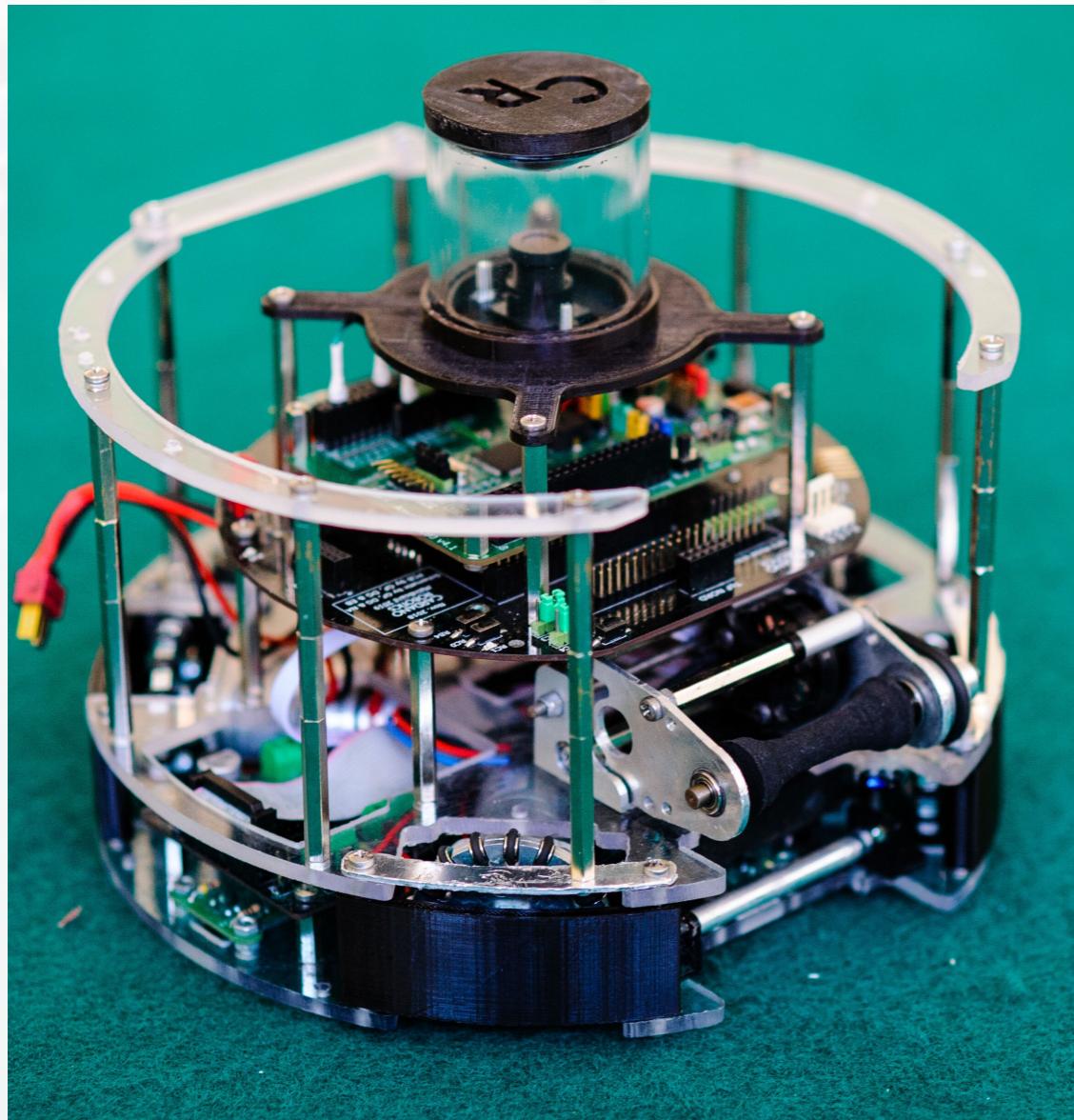
ROBOT CALCIATORI

GIANLUCA FARINACCIO

CLASSE 5A

IIS PIAZZA DELLA RESISTENZA, 1 – MONTEROTONDO





REGOLAMENTO 2019

ROBOCUP JUNIOR SOCCER OPEN LEAGUE

ALTEZZA MAX: 22 CM

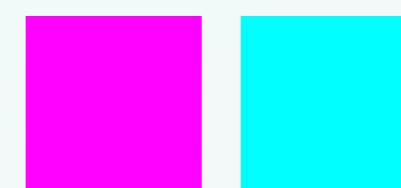
LARGHEZZA MAX: 22 CM

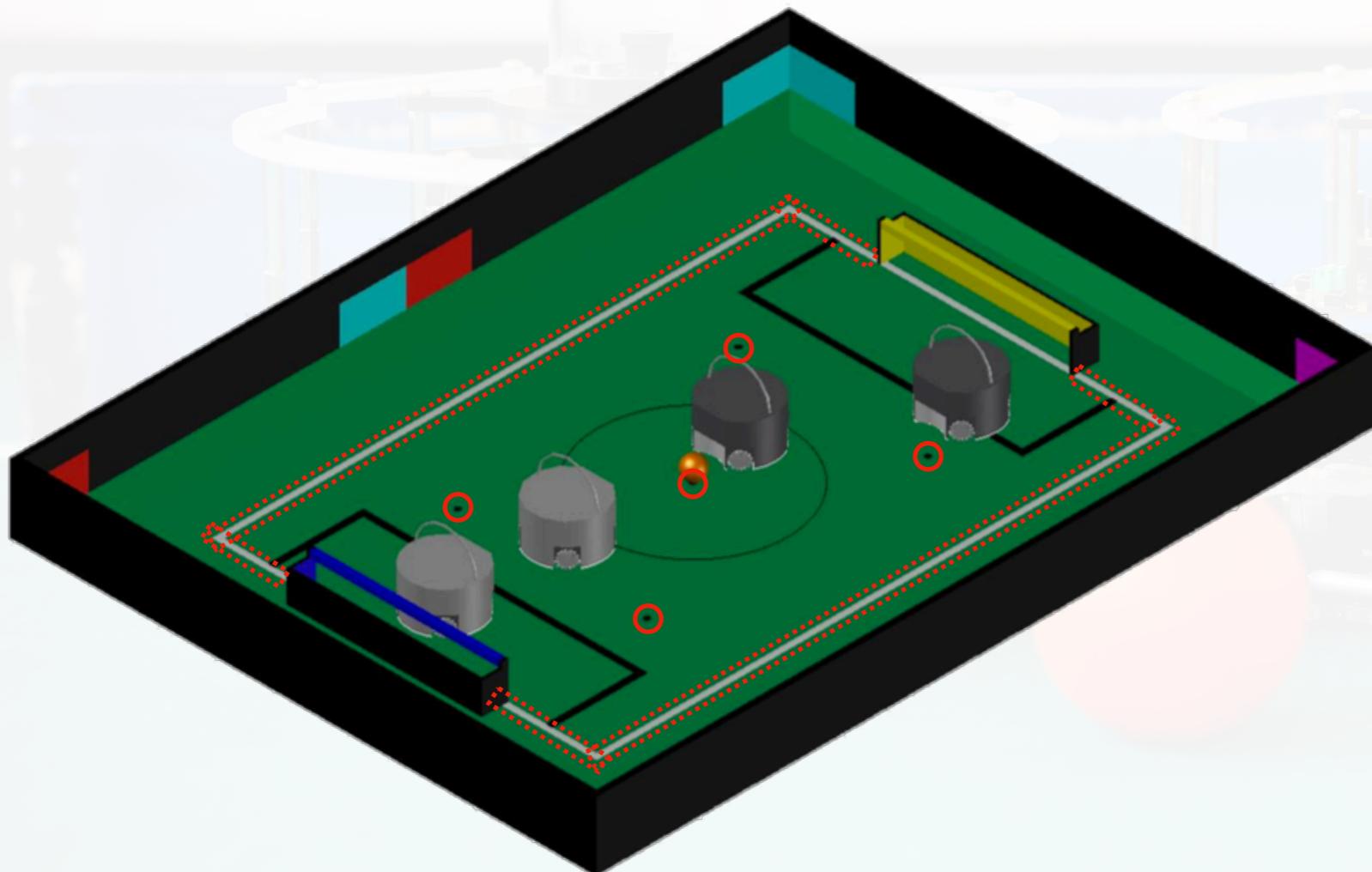
PESO MAX: 2400 GR

ZONA CATTURA-PALLA: 2.5 CM MAX

COLORI VIETATI PER LA COSTRUZIONE

DEI ROBOT:





REGOLE DELLA PARTITA:

ROBOT: 2 VS 2

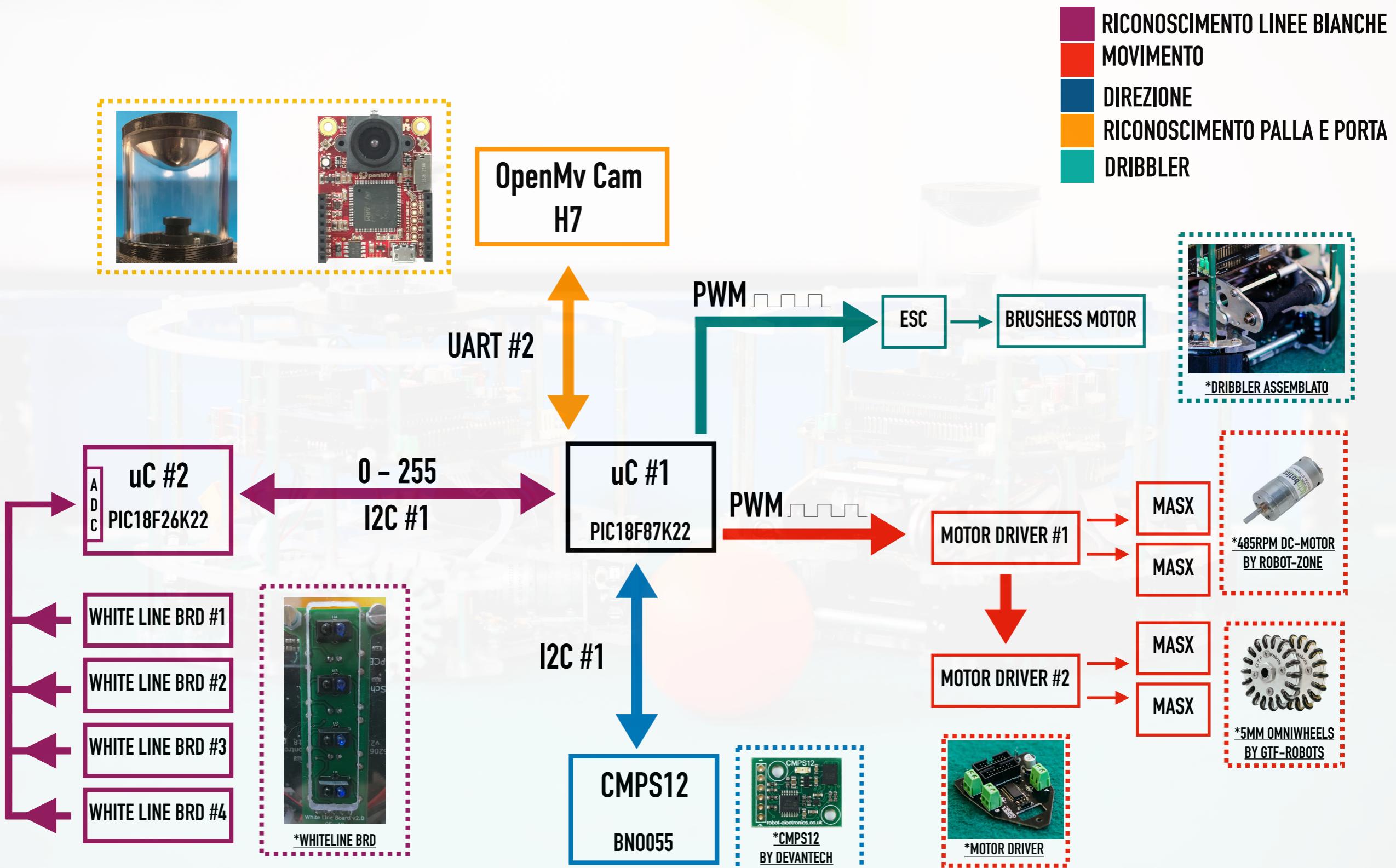
TEMPO: 2 X 10 MINUTI

INTERVALLO: 5 MINUTI

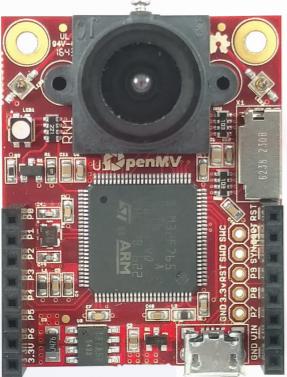
PENALITA' 1 MINUTO:

**OUT OF BOUNDS
DOUBLE DEFENSE
DAMAGE**

IIS PIAZZA DELLA RESISTENZA, 1 - MONTEROTONDO



RICONOSCIMENTO PALLA E PORTA



STM32F765VI ARM Cortex H7 (216MHz)
OV7725 CAMERA (640x480) – 30FPS
10 I/O PIN
SPI, I2C, UART, ADC, DAC, PWM
MicroPython

```

26 # CAMERA SETTINGS
27 sensor.reset()
28 sensor.set_pixformat(sensor.RGB565)
29 sensor.set_framesize(sensor.QVGA)
30 sensor.set_contrast(3)
31 sensor.set_saturation(+3)
32 sensor.set_brightness(-3)
33 sensor.set_exposure(-3)
34 sensor.set_auto_exposure(False, 2500)
35 sensor.set_auto_exposure(True)
36 #sensor.set_auto_gain(True)
37 #sensor.set_auto_whitebal(False, (-6.02073, -5.753914, -1.557143))
38 sensor.set_hmirror(True) # flip horizontally
39 sensor.set_vflip(True) # vertically
40 sensor.skip_frames(time = 300)
41
42 frame_mode = 0
43
44 # THRESHOLDS
45 ##24, 42, 41, 63, 23, 48
46 thresholds = [(46, 60, 57, 86, 22, 84), # ball
47 (69, 88, 41, -14, -50, -20)] # goal
48
49 # COORD = 158
50 #Y_COORD = 122
51
52 X_COORD = 76
53 Y_COORD = 63
54
55 # FPS
56 clock = time.clock()
57
58 while(True):
59     clock.tick()
60
61 # cx,cy,radice,codice
62 tt_ball = [(X_COORD+10,Y_COORD,0,1)] # lista di tuple palla
63 # cx,cy,w,h,codice
64 tt_goal = [(X_COORD+10,Y_COORD,0,0,2)] # lista di tuple porta
65
66 frame = sensor.snapshot()
67

```

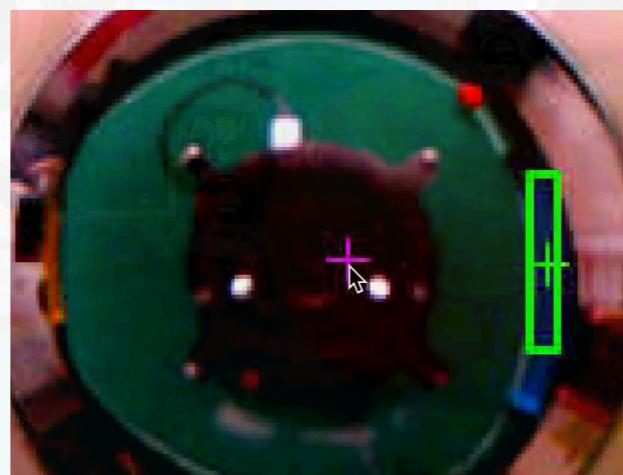
CODICE IN MICROPYTHON
CARICATO SULLA
OPENMV CAM



SPECCHIO OMNIDIREZIONALE ASSEMBLATO
ESSO CONSENTE UNA VISIONE A 360 GRADI



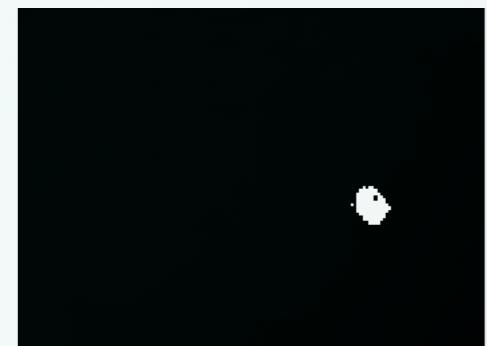
MODELLO STAMPATO IN 3D E RICOPERTO
CON PVC SPECCHIATO RISCALDATO



FRAME VIDEO DELLA OPENMV CAM
CON RICONOSCIMENTO
PALLA E PORTA.
INVIO SERIALE 12 BYTE
AL uC#1 — BBBDDDDGGGDDD



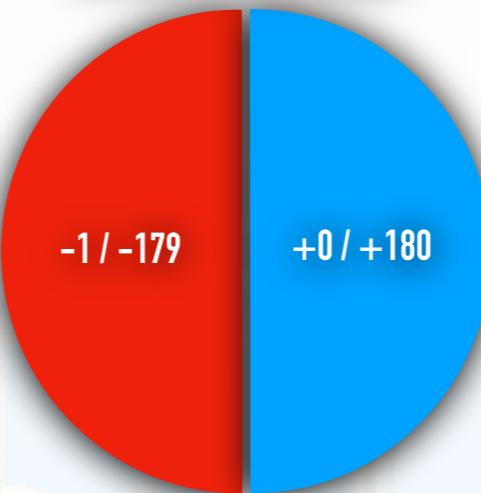
MASCHERA DELLA PORTA



MASCHERA DELLA PALLA

DIREZIONE

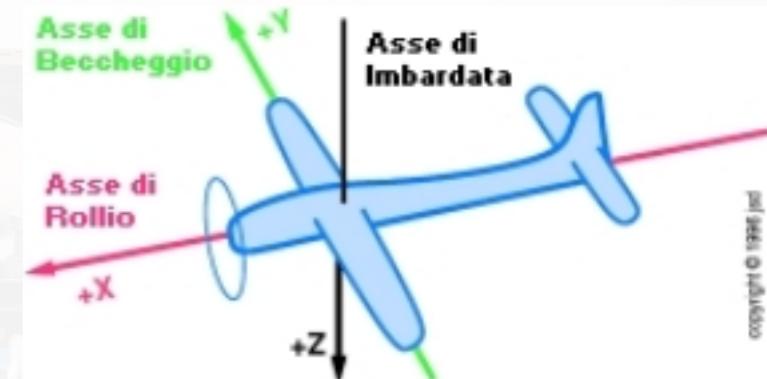
0° (NORD VIRTUALE)



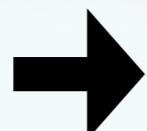
270°

90°

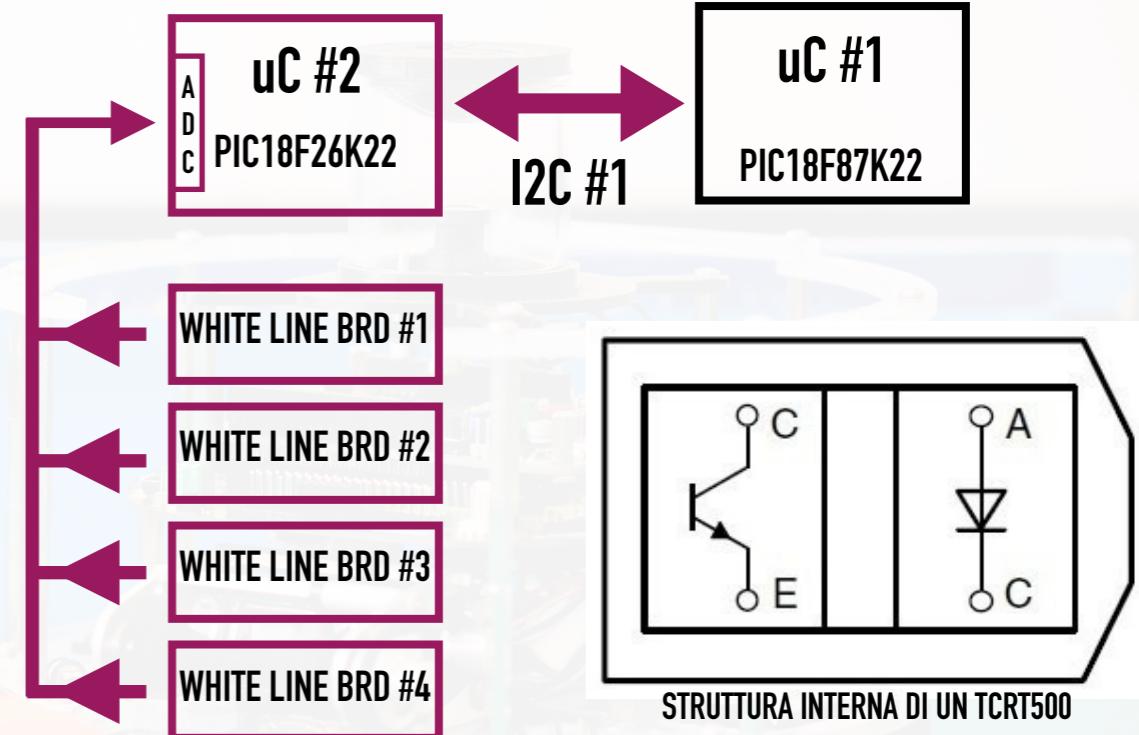
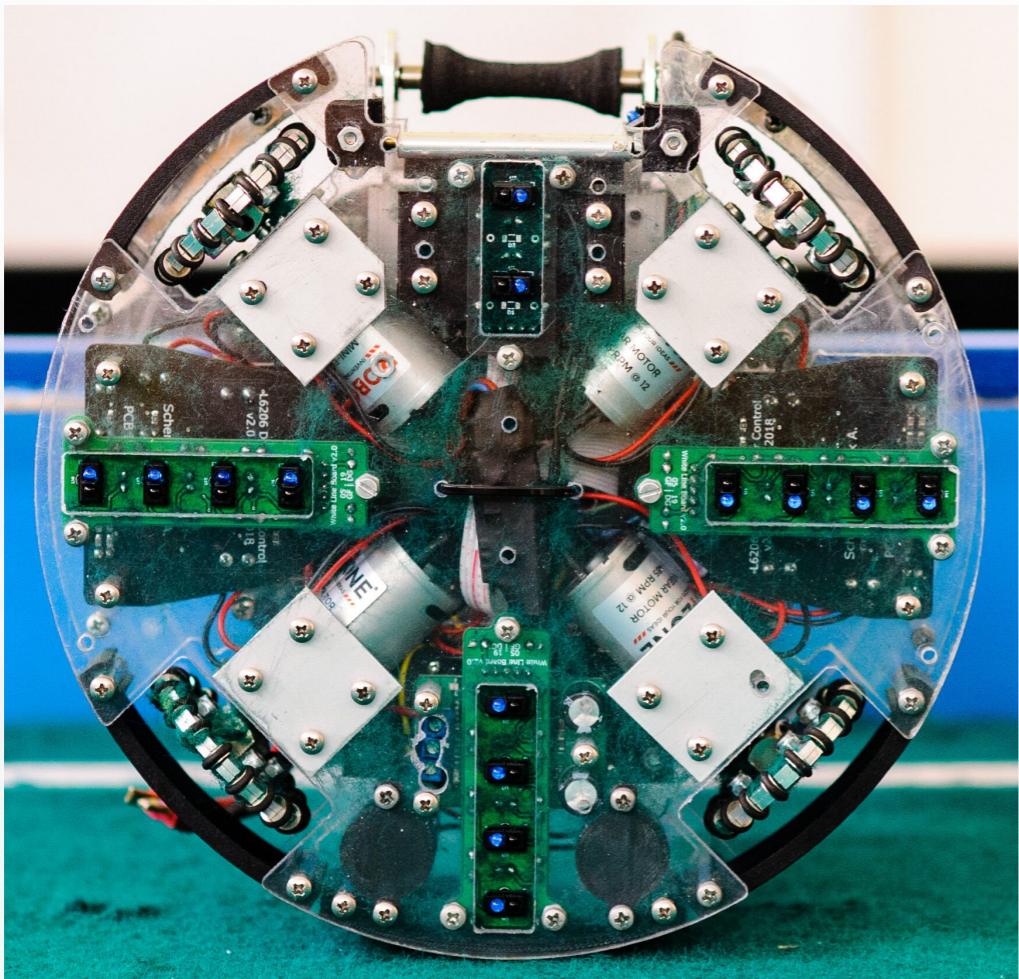
180°



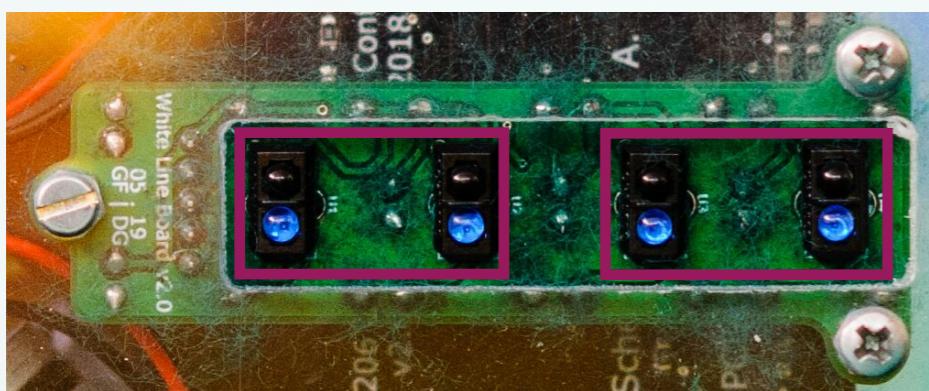
- MAGNETOMETRO, GIROSCOPIO, ACCELEROMETRO
- BN0055 AL SUO INTERNO
- INTERFACCIAMENTO IN I2C
- 0° / 359° IN BASE AL PUNTO DI ACCENSIONE



RICONOSCIMENTO LINEE BIANCHE



STRUTTURA INTERNA DI UN TCRT500



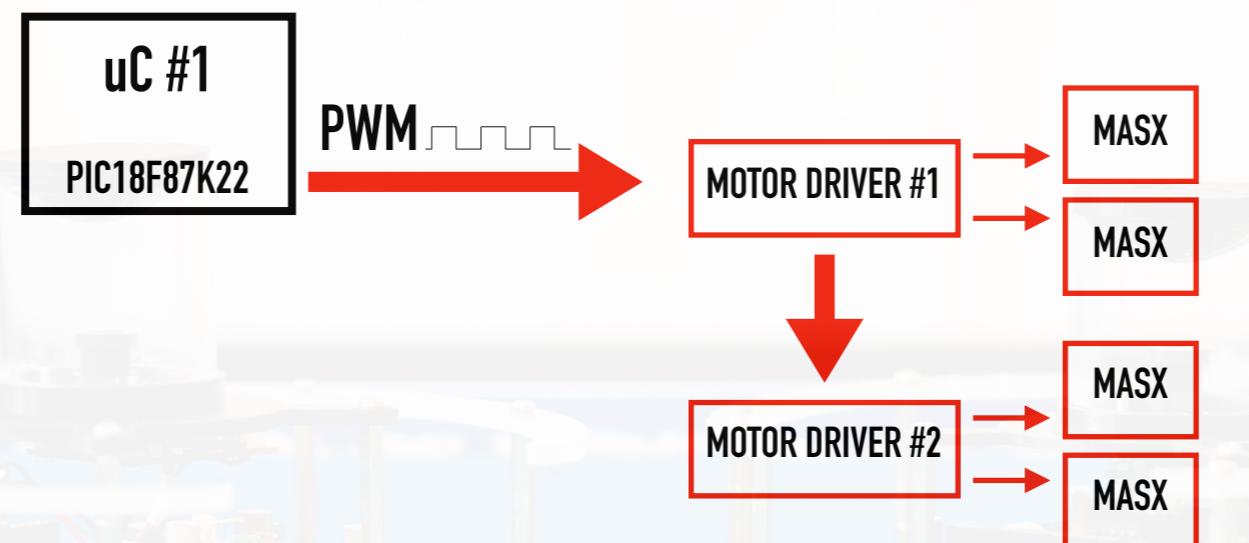
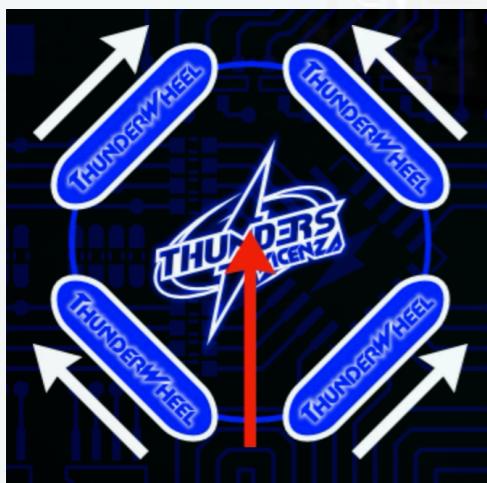
-14 SENSORI TCRT5000

- I SENSORI FORNISCONO UN' USCITA ANALOGICA COMPRESA TRA 0V E 5V IN BASE AL COLORE DEL MATERIALE POSTO SOTTO DI ESSI
- L'USCITA E' COLLEGATA SU PIN ANALOGICI DEL uC (ADC 10 BIT)
- AD OGNI SENSORE E' ASSEGNATO UN VALORE NUMERICO (0-255)
- LA POSIZIONE DEI TCRT5000 ALL'INTERNO DELLA BOARD E' STATA STUDIATA IN MODO DA NON OTTENERE SPAZI 'CIECHI'

MOVIMENTO

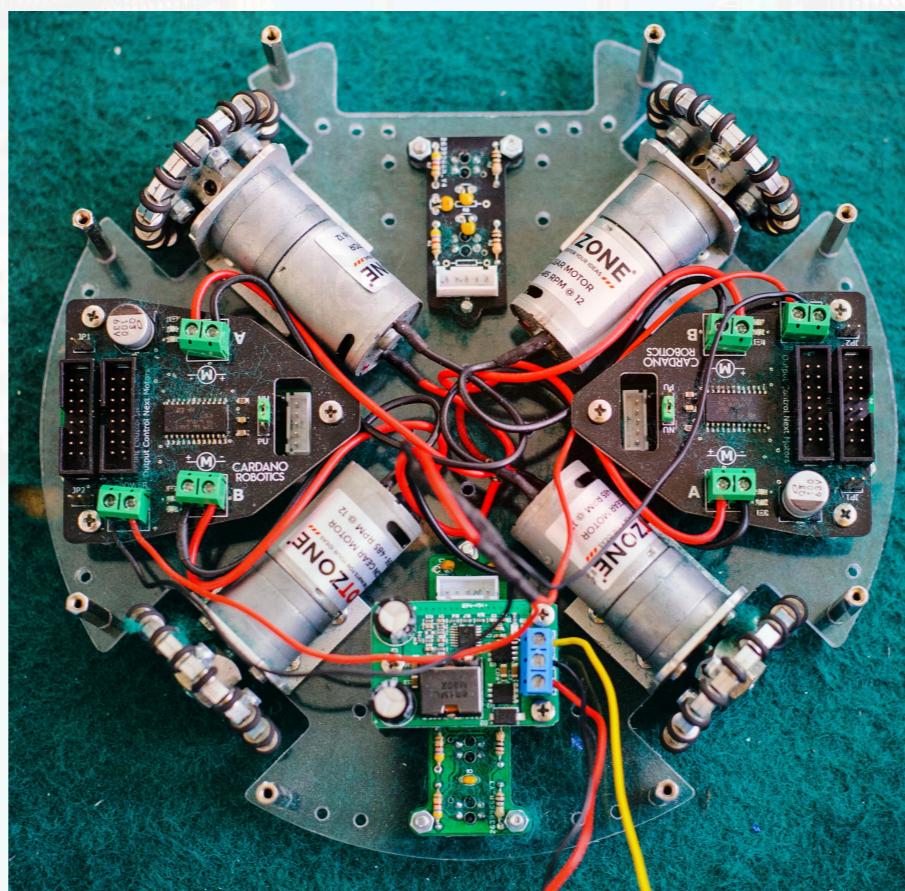
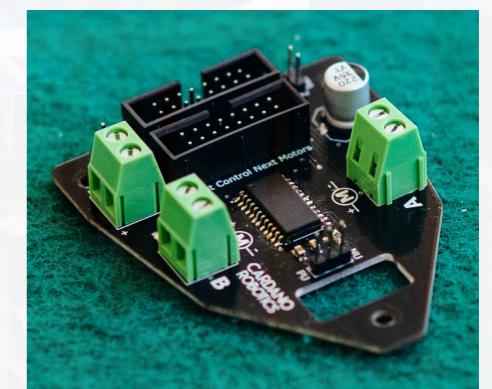
RUOTE OMNIDIREZIONALI

PERMETTONO IL MOVIMENTO
DEL ROBOT IN
QUALSIASI DIREZIONE



DRIVER MOTORI

- L6206 BY ST MICROELECTRONICS
- ENABLE, VERSO, PWM
- PWM 10KHZ GENERATO DAL uC#1

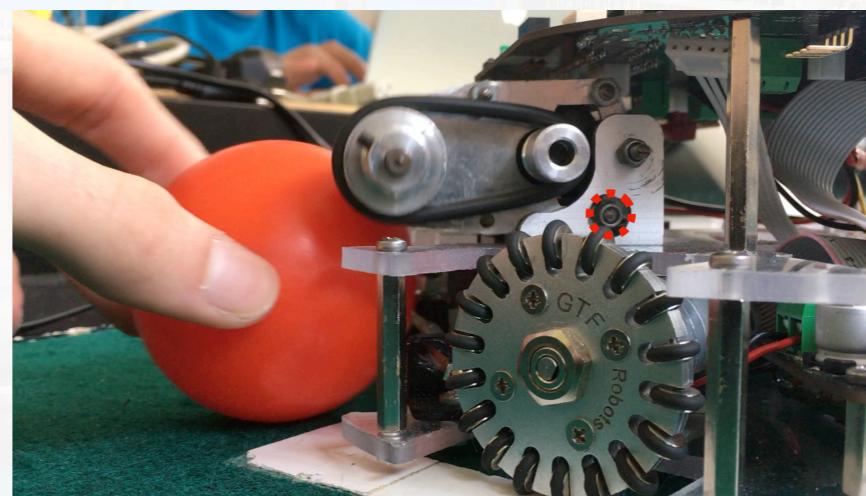
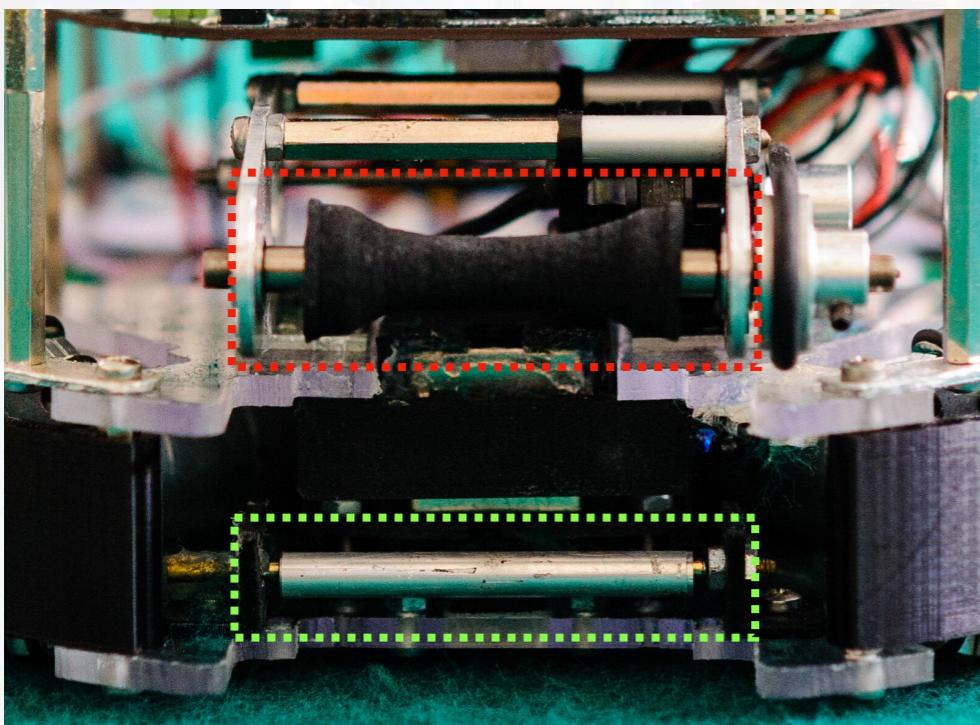
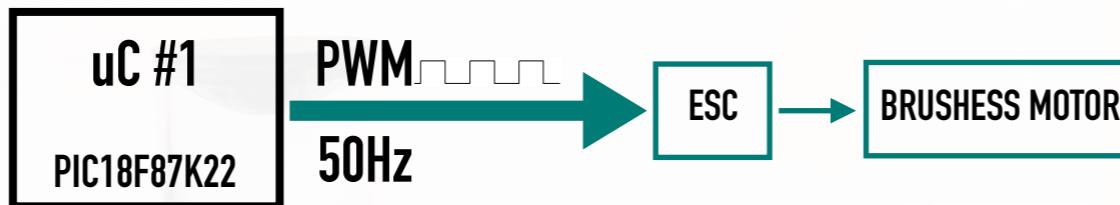


ATTUATORI

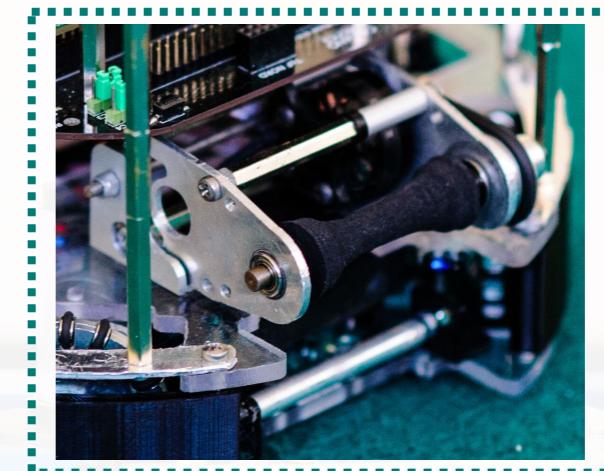
- DC BRUSHED MOTOR
- 485 RPM
- 12V



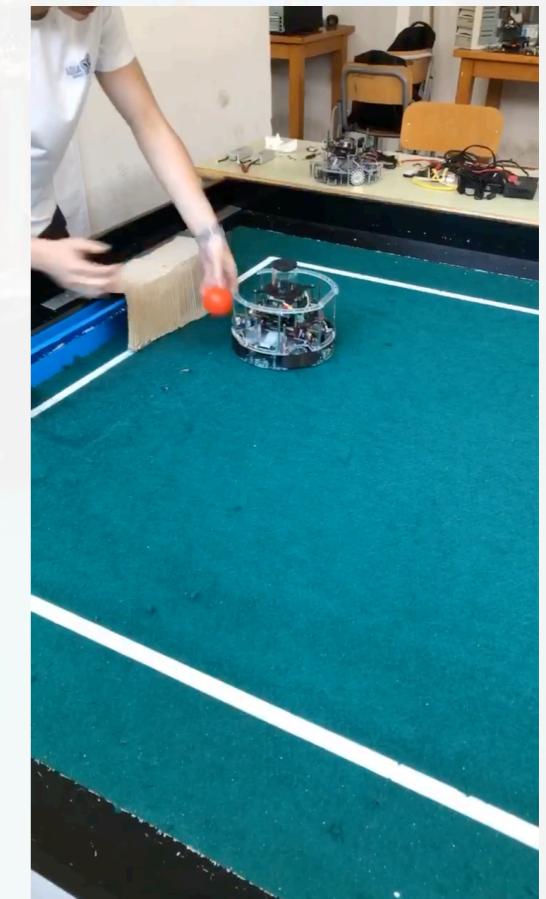
DRIBBLER



FINE CORSA



*DRIBBLER ASSEMBLATO



RULLO ATTIVO (movimento generato dal motore brushless)

RULLO PASSIVO (movimento generato dalla palla)

TATTICA DI GIOCO





CardanoRobotics

Campioni Italiani RobocupJunior Soccer Open

ROBOT CALCIATORI