from controller import Robot

robot = Robot()

timestep = int(robot.getBasicTimeStep())

time\_step = 32

max\_speed = 5

last\_error=I=D=P=error=0

kp=1.4

ki=0

kd=0.1

#motor

wheels = []

wheelsNames = ['wheel1', 'wheel2', 'wheel3', 'wheel4']

for i in range(4):

wheels.append(robot.getDevice(wheelsNames[i]))

wheels[i].setPosition(float('inf'))

wheels[i].setVelocity(0.0)

#IR sensor

ds = []

dsNames = ['Right','Mid', 'Left']

for i in range(3):

ds.append(robot.getDevice(dsNames[i]))

ds[i].enable(time\_step)

#mainloop

while robot.step(time\_step) != -1:

right\_ir\_val=ds[0].getValue()

mid\_ir\_value=ds[1].getValue()

left\_ir\_value=ds[2].getValue()

print("left: {0}, middle: {1}, right: {2}".format(left\_ir\_value,mid\_ir\_value,right\_ir\_val))

if left\_ir\_value < 425 and right\_ir\_val < 425 and mid\_ir\_value >= 835:

error=0

elif left\_ir\_value < 425 and right\_ir\_val >= 425 and mid\_ir\_value >= 835:

error=-1

elif left\_ir\_value >= 425 and right\_ir\_val < 425 and mid\_ir\_value >= 835:

error=1

elif left\_ir\_value >= 425 and right\_ir\_val < 425 and mid\_ir\_value < 835:

error=2

elif left\_ir\_value < 425 and right\_ir\_val >= 425 and mid\_ir\_value < 835:

error=-2

P=error

I=error+I

D=error-last\_error

balance=int((kp\*P)+(ki\*I)+(kd\*D))

last\_error=error

left\_Speed=max\_speed-balance

right\_Speed=max\_speed+balance

if left\_Speed> max\_speed :

wheels[0].setVelocity(left\_Speed)

wheels[1].setVelocity(0)

wheels[2].setVelocity(left\_Speed)

wheels[3].setVelocity(0)

if right\_Speed> max\_speed :

wheels[0].setVelocity(0)

wheels[1].setVelocity(right\_Speed)

wheels[2].setVelocity(0)

wheels[3].setVelocity(right\_Speed)

if left\_Speed < 0:

wheels[0].setVelocity(0)

wheels[1].setVelocity(right\_Speed)

wheels[2].setVelocity(0)

wheels[3].setVelocity(right\_Speed)

if right\_Speed < 0:

wheels[0].setVelocity(left\_Speed)

wheels[1].setVelocity(0)

wheels[2].setVelocity(left\_Speed)

wheels[3].setVelocity(0)

if left\_Speed == max\_speed:

wheels[0].setVelocity(left\_Speed)

wheels[1].setVelocity(right\_Speed)

wheels[2].setVelocity(left\_Speed)

wheels[3].setVelocity(right\_Speed)

if right\_Speed == max\_speed:

wheels[0].setVelocity(left\_Speed)

wheels[1].setVelocity(right\_Speed)

wheels[2].setVelocity(left\_Speed)

wheels[3].setVelocity(right\_Speed)

pass