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MECH6631 Project Report

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Abstract

technology

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Chapter 1

Introduction

As shown in Figure 1.3, two robots perform a competition in this project. Two robots chase each other and try to hit the opponent with laser, which are controlled via intelligent algorithms. This report mainly introduces the algorithms for image processing and robot control.

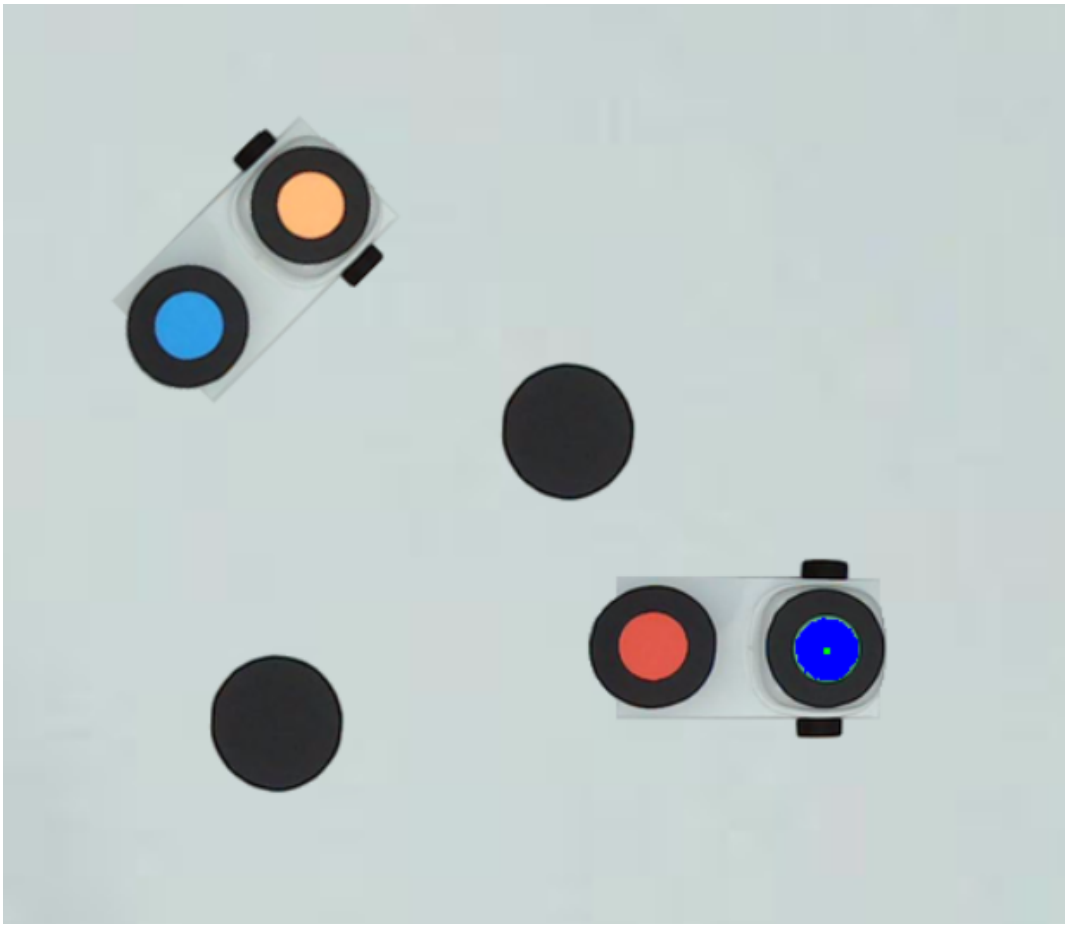

Figure 1.1: Overview of the project.

1.1 Modelling of the Robot

There is no wheel slipping,

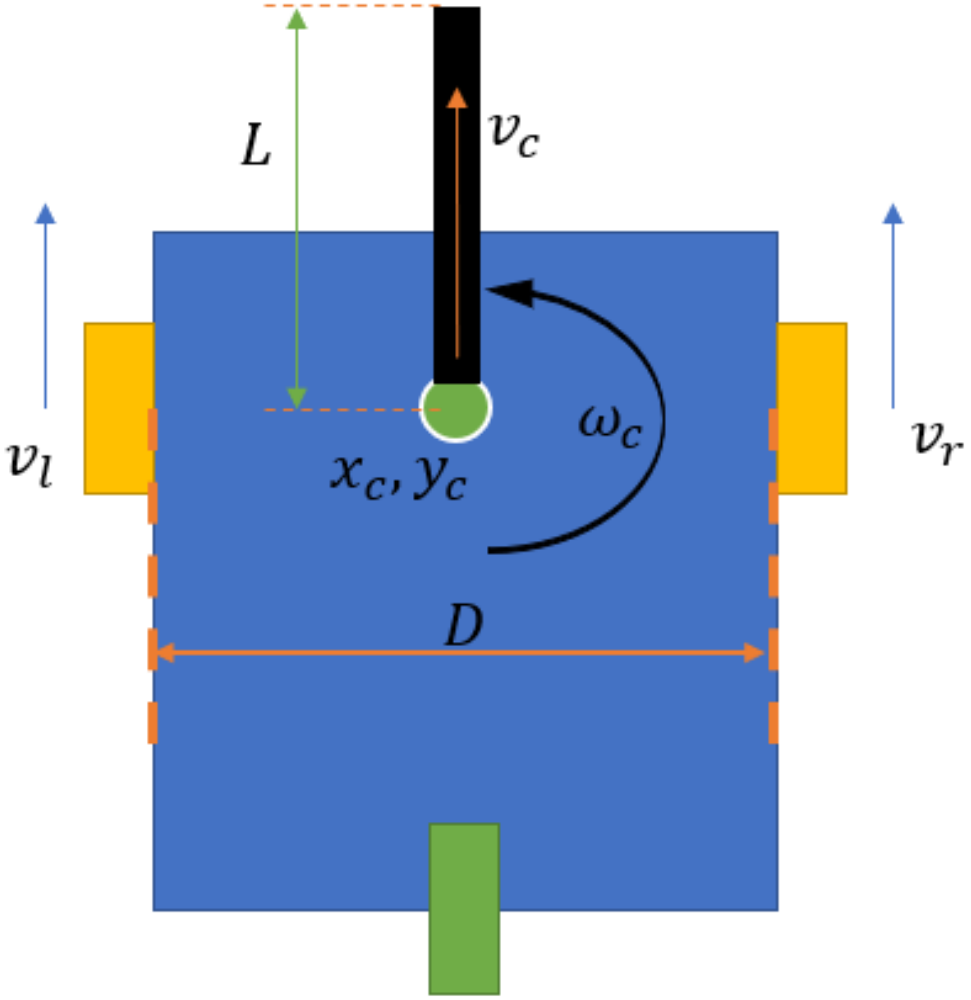

Figure 1.2: vehicle model.

$$v_r = \omega_r R$$

Where v_r is the linear velocity, R is the radius of wheel, and ω_r is the angular velocity.

x_c and y_c is the coordinate of the vehicle centre. θ is the direction of vehicle. D is the distance bewteen two wheels. The geometry model of this vehicle is shown below:

$$v_c = (v_r + v_l)/2$$

$$\omega_c = (v_r - v_l)/D$$

$$\dot{\theta}_c = \omega_c = (v_r - v_l)/D$$

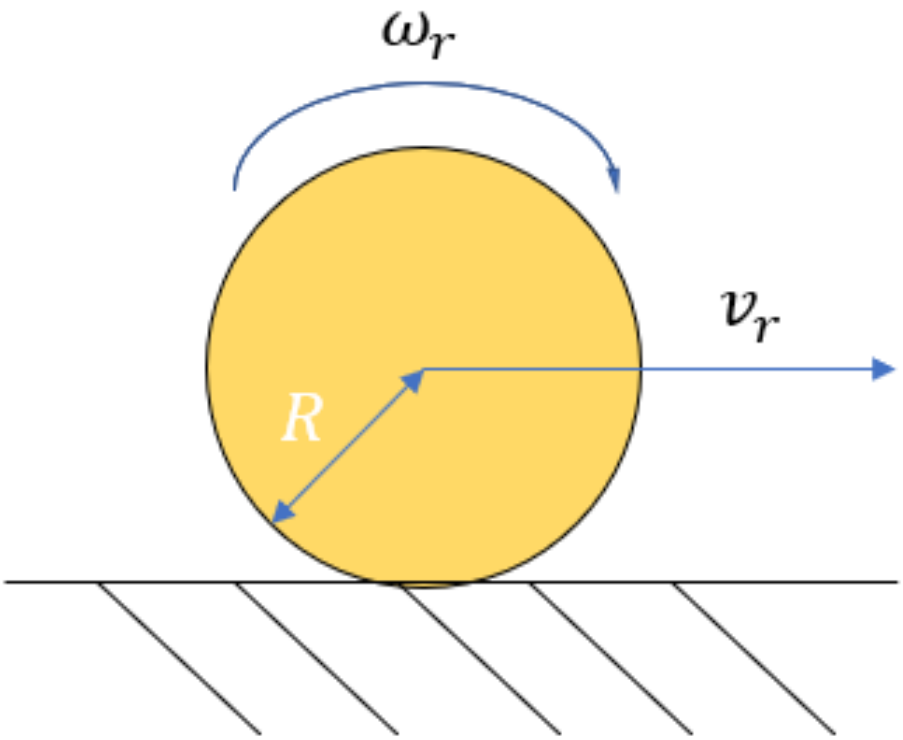

Figure 1.3: wheel model.

1.2 Teamwork

Name	Project Management	Image Processing	Robot Control	Report Writing
Qiaomeng Qin	System design	Coding	Coding	Introduction, Integration
Xiaobo Wu				
Yuelong Wu				
Mario				

Chapter 2

Image Processing

Colour	Red Value	Green Value	Blue Value
Green(A1)	67	180	131
Red(A2)	226	90	77
Orange(B1)	255	189	124
Blue(B2)	48	158	228

Chapter 3

Robot Control

Chapter 4

Coding