

第 19 屆 TDK 盃全國大專院校創思設計與製作競賽

機器人特色簡介

填寫日期: 2015/10/30

基本資料

組別：自動組

學校名稱：中州科技大學

指導老師：賴永進

隊伍名：中州電機 A 隊

機器人特色簡介

本屆 TDK 競賽主題為「機器人文武雙全一科遇 Book 球」，這次機器人競賽我們的機器人需要具備寫字、辯色、置筆、抄球、帶球過人以及投籃等功能。我們寫字機構是用 x、y、z 軸帶動馬達跟夾爪來移動，在 x、y、z 軸裝上鏈條，馬達帶動齒輪在鏈條上移動；夾球機構也是用 x、y 軸裝上鏈子，馬達帶動齒輪在鏈條上移動，夾爪上我們用了軟墊來防止滑落。至於機器人名，我們從這次競賽規則的關卡，第一關的寫字區和最後一關的投球區，裡面有寫字和投籃，寫字想成文青、投籃想成運動員，故機器人的名稱為文青運動員，希望他能有運動員的精神，所以這就是機器人名子的由來。

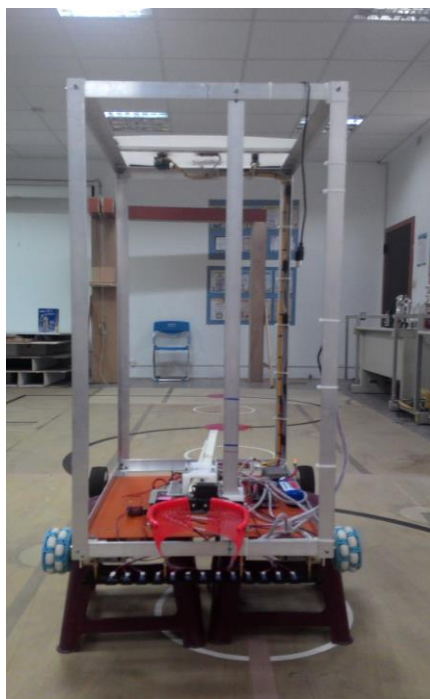


Fig.1. 創思機器人 --- 正視圖。

圖片說明:

夾球的機構就是用泡棉膠加魔鬼氈做的夾爪，夾球的位子外加洗菜籃和軟墊防止沒夾緊和掉落，經過測試大部分都能成功投進，不過也要考量沒夾好的情況，避免失誤沒辦法補救，前方裝置的下方我們用紅外線來感測黑線進行循跡，前面的輪子用全向輪來方便轉彎。

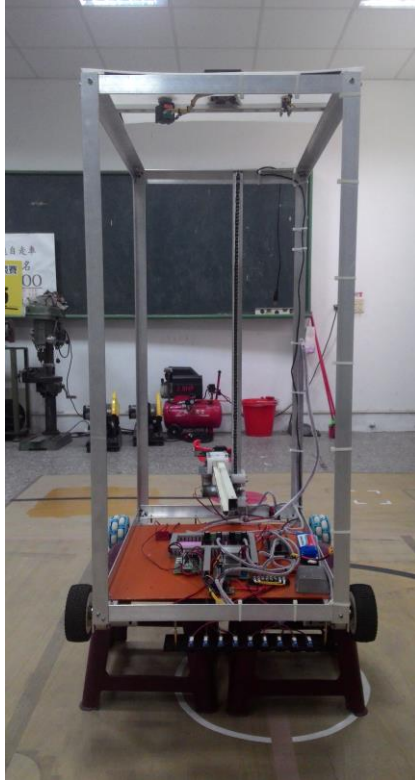


Fig.2. 創思機器人 --- 後視圖。

圖片說明:

我們在機器人的後方也裝了紅外線來循跡，讓機器人可以從前面循跡

跟後面循跡來增加寫字跟投球的穩定性，後方的輪子是用一般的輪子

來驅動，搭配前方的全向輪，使行走時更加穩定。

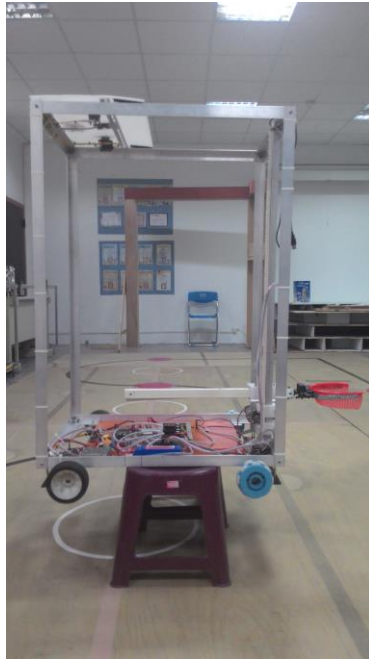


Fig.3. 創思機器人 --- 右側視圖。

圖片說明：

我們把電路盡量放在機器人的右邊來平衡，左邊跟前方的重量，使重量分配平均。

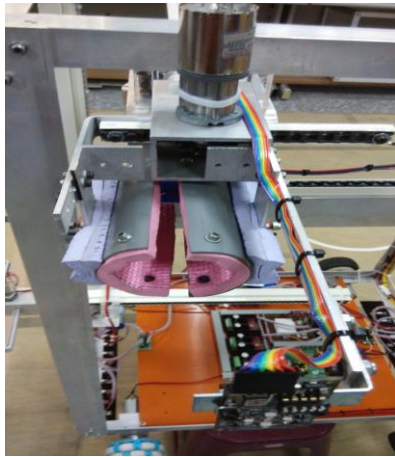


Fig.4. 創思機器人 --- 左側視圖。

圖片說明:

齒輪咬鐵鍊的夾球夾爪，以那個重新做一個單項移動的夾爪，將原本夾爪上的零件移到新的夾爪上，再做一點小小的變動，在測試看看夾不夾的緊，在單動的另一邊固定上 RGB 以變別色板顏色，寫字的 X 軸和 Y 軸我們用鐵鍊來帶動，Y 軸用馬達帶動齒輪讓兩邊的齒輪咬住鐵鍊，來進行上下移動，X 軸固定在 Y 軸的 L 鋁板上，馬達齒輪帶動 X 軸，這樣就可以借助鐵鍊來進行上下左右移動，夾筆套的機構我們也試過很多種讓筆套夾緊而且能正常寫字的方法，最後就決定夾筆套的機構是用水管加軟墊來製做而成，練習寫字時要經過反覆的修改才能正確的抓準位置以最短的距離來完成寫字。

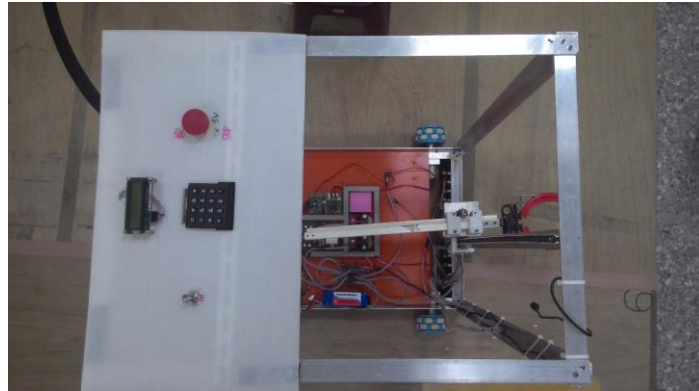


Fig.5. 創思機器人 --- 俯視圖

圖片說明:

我們機器人的電路是用三個降壓器來製作，因為零件所需要的電壓都不相同，還用了馬達驅動器，控制馬達轉動，保險絲用來保護零件，紅外線用來巡機，主控板用來控制所有的電路。

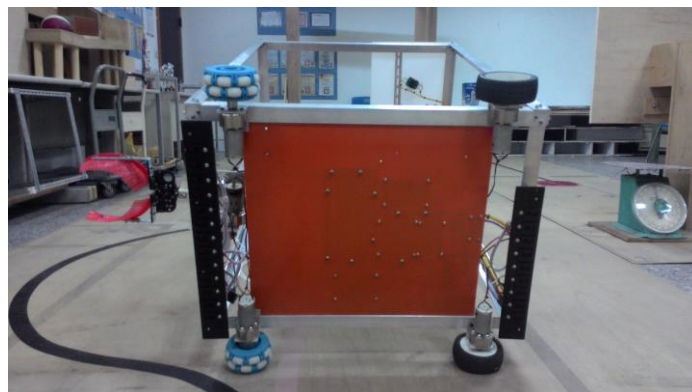


Fig.6. 創思機器人 --- 底視圖。

圖片說明:

我們用螺絲把電路都鎖緊防止電路在移動中，因為突如其來的抖動而滑落，紅外線也用銅柱跟螺絲鎖緊。



Fig. 7. 創思機器人 --- 特色圖。

圖片說明：我們機器人的設計理念和創意是從這次競賽規則裡面的關卡想出來，第一關的寫字區和最後一關的投球區，我們選出最適合放置寫字機構的位置和最適合夾球、放球機構的位置來擺放，寫字機構是我們從大樓用的洗窗機想出來，夾球、放球的機構是我們從工廠用的吊臂和夾娃娃機想出來，電路是用機構的相反位置擺放，目的是用來維持整體的平衡，整個機器人的外觀也是用這種方式做出來，機器人的名子也是以這種方法來命名。

19th TDK Cup National universities think of a design and production contest

Robot Features Introduction

Fill Date: 2015/10/30

Basic information

Group: Automatic

School Name: Chung Chou University of Science and Technology

Instructor: Young Jinn Lay

Team name: Chung Chou EE A Team

Robot Features Introduction

TDK current contest theme is "Robots civil and military - Book ball Branch case", the robot competition robot we need to have to write, argue color, pen set, copy the ball, dribbles and shooting functions. We write institutions with x, y, z-axis drive motor with jaws to move in x, y, z-axis mounted on the chain, motor driven gear moved in the chain; clip ball mechanism is also used x, y-axis fitted chain, motor driven gear in the chain to move the jaws we use the cushion to prevent slipping. As for the level robot name, from the contest rules, the first hurdle of writing area and the last one off the pitching area, which has to write and shoot, write want written green, shooting into the athletes want, it is the name of the robot Wen Qing athlete, I hope he can have the spirit of the athletes, so this is the origin of the robot Mingzi.

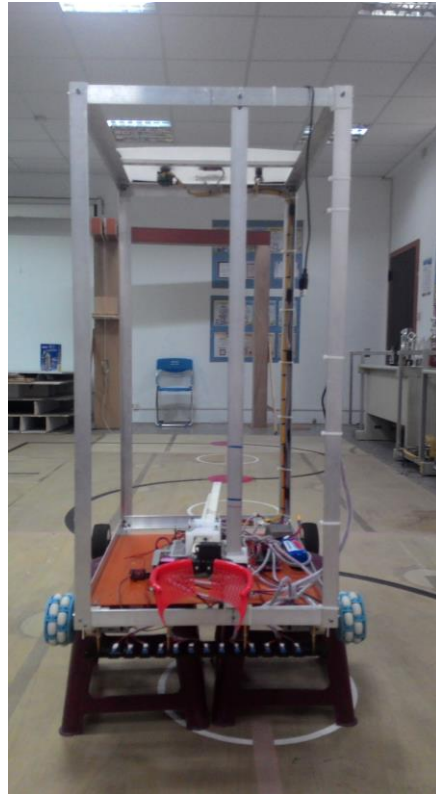


Fig.1. Creative thinking --- a front view of the robot.

Description:

Clip ball mechanism is to use foam rubber plus Velcro done jaw folder plus vegetables blue ball and seat cushions not prevent clamping and fall, most can successfully tested dropped, but also consider no good case folder, not a remedy to avoid mistakes, the bottom front of the device we use infrared to sense black line tracking, front wheel with omnidirectional wheel to facilitate cornering.

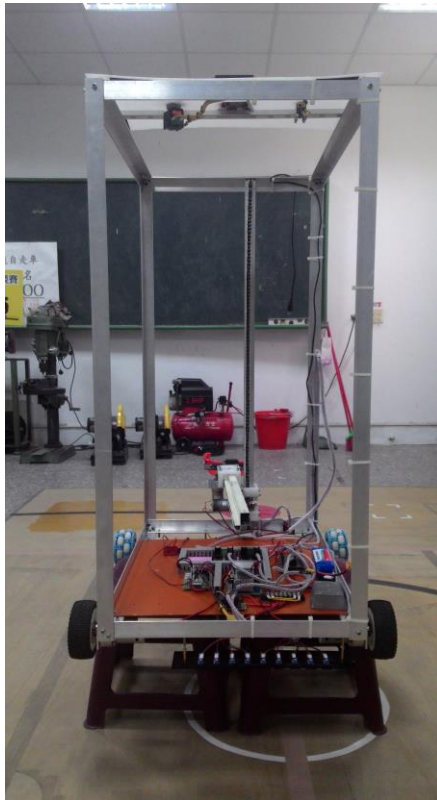


Fig.2. Creative thinking robot --- rear view.

Description:

We also installed in the rear of the robot to infrared tracking, tracking from the front so that the robot can now write back tracking to increase the stability with pitching, the rear wheels are driven by conventional wheels, with the front of the omnidirectional wheel, make more stable when walking.



Fig.3. Creative thinking --- right side view of the robot.

Description:

We try to put the circuit on the right side of the robot to balance, on the left with the weight of the front, so that the weight distribution average.

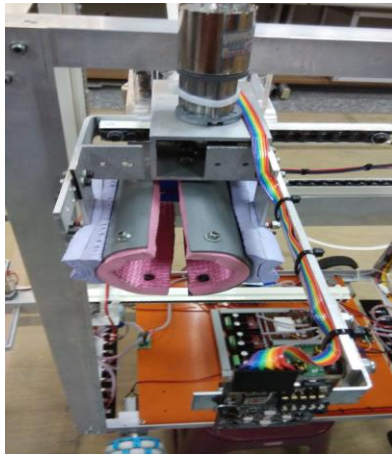


Fig.4. Creative thinking --- left side view of the robot.

Description:

Gear chains bite jaws clamp ball to the re-do a single movement of the jaws, the jaws of the clamp parts originally moved to the new jaws, do change a little, take a look at the test folder does not clip tight, in a single move on the other side of fixed to variable do RGB color palette, writing X-axis and Y-axis we use chains to drive, Y-axis motor driven gear so that both sides of the gear bite chains, to move up and down, X-axis is fixed to the L aluminum Y-axis, the X-axis motor gear driven, so you can use chains to move around, clip pen institutions we have tried a variety of clamping and can make pen normal writing method, and finally decided to clamp mechanism pen with water plus cushion to the system to do when writing exercise to go through repeated changes to the correct position for grasping the shortest distance to finish writing.

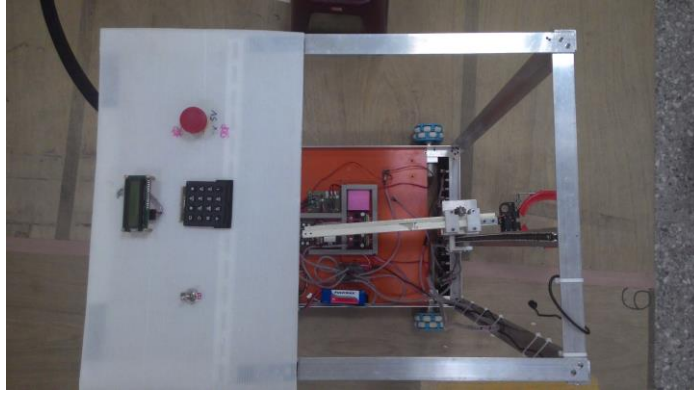


Fig.5. Creative thinking --- a plan view of the robot

Description:

Circuit our robot with three buck to make, because the parts required are not the same voltage, but also with a motor drive control motor rotation, fuse to protect the parts, used infrared patrol aircraft, the main control board to control all the circuits.

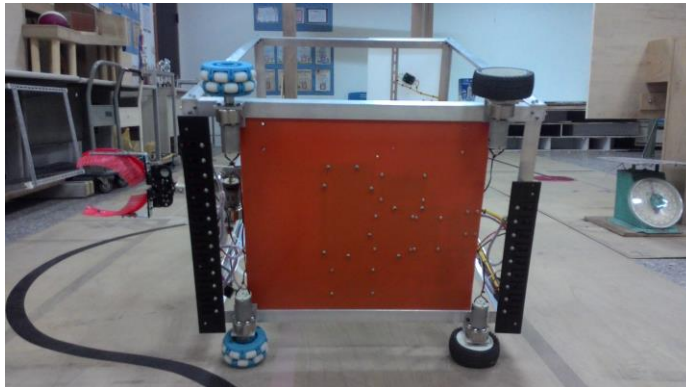


Fig.6. Creative thinking --- a bottom view of the robot.

Description:

We are locking screws of the circuit prevention circuit on the move, because the sudden shake and fall, also use infrared pillars with mounting screws.



Fig. 7. Think of a robot --- Features figure.

Caption:

Our robot design and creativity from the contest rules inside the checkpoint came up, first off the writing area, and the last one off the pitching area, we select the most suitable place to write institutions and the most appropriate location folder ball, put the agency to place the position of the ball, writing bodies from the building we used to come out of the washing of windows, clip the ball, we put the ball in the institution from the factory with the boom and clip dolls want to come out, the circuit is placed in the opposite position with the organization, the purpose is to maintain the overall balance, the appearance of the entire robot is to do it this way, Mingzi robot is named in this way.