參賽隊伍人員及機器人簡介

Team Member and Robot Introduction

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壹、機器人簡介　**The robot Introduction**

一、構想與策略分析　Vision and strategy analysis

機器人腳的部分是以類似划船的方法去控制機器作動的方式，如圖 1。夾爪及手臂的部分是以雲梯和螃蟹手的樣式去設計而成，如圖 2。

我們的策略以夾取平地的娃娃和跑完一圈為主要核心策略，如果時間許可，可夾取低窪處的娃娃為第二目標。

Part of the foot of the robot in a similar boating as in Figure 1, control machine actuation, folder designed with claw and arm style based on aerial ladders and crab hand as in Figure 2.

Our strategy is gripping the plains doll and to finish the lap as the main core strategy, if time permits, gripping low-lying area at the doll for the second goal.

圖 1 機器人腳的部分

圖 2　機器人夾爪及手臂的部分

二、機構設計 Mechanism Design

腳的部分是利用不銹鋼管凹成 L 型當作傳達動力的連接桿，帶

動鋁矩形的腳去做的移動方式，使其可前進後退轉彎，鋁矩形的腳利用洗床的方式去洗出一個槽，如圖 3。搭配Ｌ形不銹鋼管、固定在機體上的經加工後的固定圓柱及往復的滑軌運動，再加上墊片螺絲及螺帽固定後，上些許黃油加以潤滑，使其摩擦係數降低，然後經過計算測量將腳的尺寸改至可輕鬆跨越衡木長度，腳底裝置高摩擦係數的物件，使其行走上下坡不易打滑。

手的部分是將一長條鋁矩形等距離挖槽，再用鋁塊設計一個十字型的鋁件當作滾輪去帶動長條鋁矩形使其伸長縮短，夾爪的部分是以螺桿機構去控制夾爪的閉合，使其能夾去物件，最上面的馬達及減速機構去帶動夾爪的上下移動，旁邊的馬達是做夾爪的夾取及手臂的前進後退。

The foot portion is the use of a stainless steel tube recess into the L-type of the connecting rod as convey power driven the aluminum rectangular foot do moves forward and back so that it can turn, aluminum rectangular foot to wash a wash bedslot as in Figure 3, with L-shaped stainless steel tube, fixed body after processing a fixed cylinder and reciprocating slide movement, coupled with the gasket fixed screws and nuts, a little butter to lubricate itreduce the coefficient of friction, then change has been calculated to measure the size of the foot to easily spans the value wood length, foot device object of the high coefficient of friction, easy to slip it walking on the downhill.

Part of the hand is a long strip of aluminum rectangular equidistant Trench, aluminum block design of a cross-shaped piece of aluminum as a wheel to drive the long aluminum rectangular to elongate shortened jaws is based in part on the screw mechanism to control the jaws closed, so that it can folder to objects, the top of the motor and the reduction mechanism to drive the vertical movement of the jaws, the next motor is doing the gripping jaws and arms forward and backward.

圖 3 鋁矩形的腳洗一個槽

三、電路設計 Circuit design

利用繼電器控制馬達，以串聯的方式去連接左邊的兩顆馬達和右邊的兩顆馬達，手臂的接法和腳的接法是一樣的，如圖 4 及圖 5。

The use of relay control motors, the two motors of the left and right two motors are connected in series, the connection method is the same as for the connection of the arm and foot as in Figure 4 and Figure 5

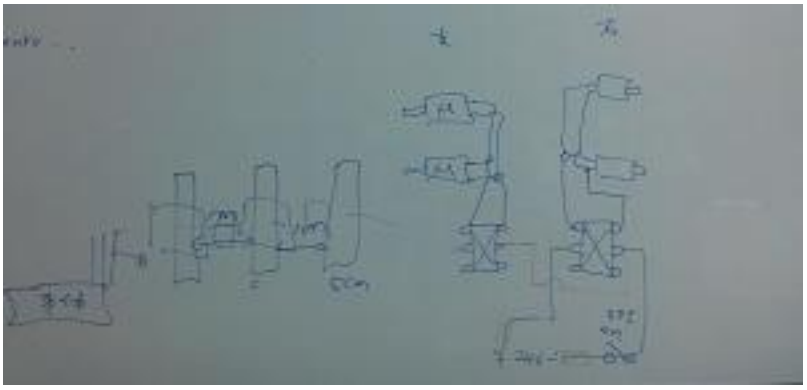

圖 4 繼電器控制馬達串聯草圖 1

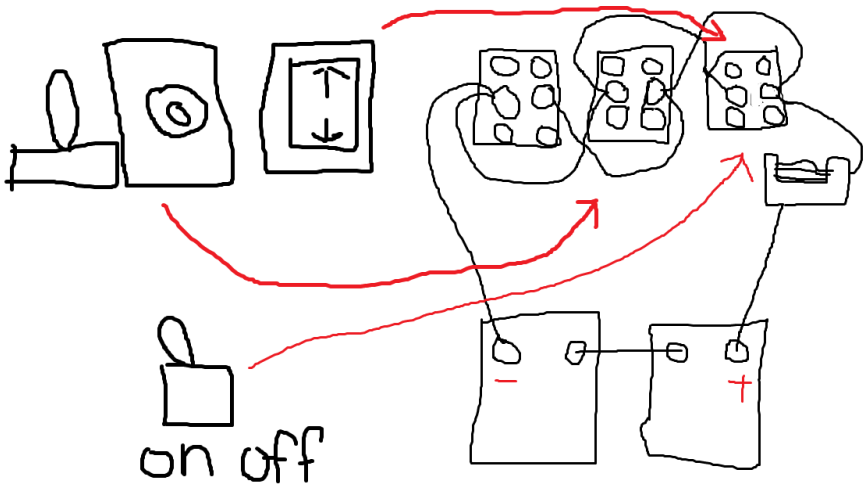

圖 5 繼電器控制馬達串聯草圖 2

四、組裝、測試與修改 Assembly, test, and modify

以螺絲、螺帽、墊片、焊接、鑽床，洗床、車床及切削將材料組裝。以剉刀將物件去毛邊，最後我們確定行走方式後將不銹鋼彎管及馬達軸以焊接的方式和起來，使其穩固不再鬆脫，如圖 6。

Screws, nuts, gaskets, welding, drilling, washing bed lathe, cutting the material assembled. Shaved knife object to Burr Finally, we determine the stainless steel pipe and the motor shaft will walk way of welding together, so that the establishment of a firm and no longer loose as in Figure 6.

圖 6 不銹鋼彎管及馬達軸的焊接

五、機器人創意特色說明 Robot creative Features Description

我們這台機器人的特色在於腳的部分是較像划船的方式前進，而手臂的方式較為跟其他隊不同，是利用類似雲梯方式而不用氣壓或螺桿的方式去做手臂。

The characteristics of this robot is part of the foot is more like rowing forward, arm way more with the other team is the way to do it using similar aerial ladders without pneumatic or screw arm.

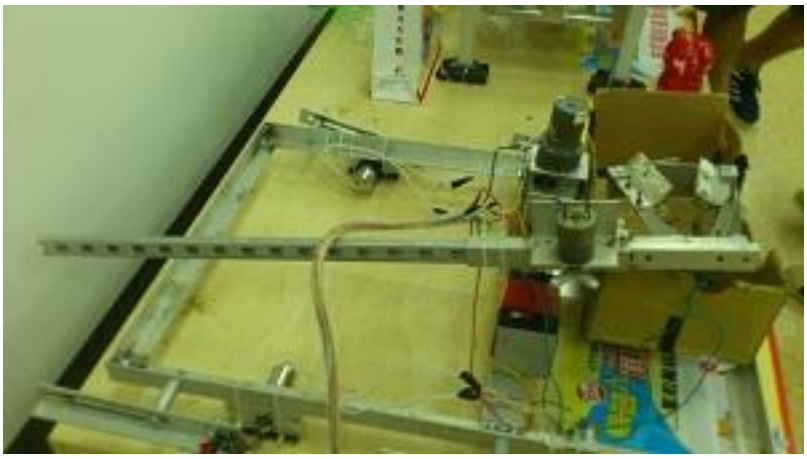

圖 7 雲梯造型的手臂

貳、參賽心得　Competition experience

經過這次的比賽，讓我深深學到許多東西，無論是各隊的機構想法和特色，甚至對於整個機體的創意構思，掌控時間操作熟練度，都是可以讓我們去做個對照及思考，有許許多多的零件、機構都是我們沒有去想到的，而其他隊伍卻可以將它做的完整且具有效率的，雖然我們很不服氣，但看到了其他隊伍用心的這幾個月，想必也是無夜無日的加工再加工，修改再修改，將缺點全部改掉，發揮最大的優點，這是我對入圍八強的隊伍深深的崇拜及讚美。

回途的路上，帶著遺憾及落寞的表情，卻隱藏不了我們這幾個月日日夜夜在一起努力的成果，從一開始的購買材料，直到後面常常因為加工到學校待到半夜兩三點，雖然我們沒有入圍前八強，真的非常可惜，如果不是因為第二場馬達齒輪又鬆脫，不然我們一定進前八強，但在過程中，我們學到的東西和團結在一起絞盡腦汁想想法，更

是難能可貴的，臉上是難過的，心裡是悸動的、開心的，因為我們有用盡全力去做，用盡我們在聖約翰科技大學三年來所學到的各個專業科目，在我們心中，我們是第一名的。

我認為貴校所辦的比賽，非常的有意義，不但可以激發各個學生的想法、創意及構思，更能讓我們發現團隊的重要性，一個隊伍單槍匹馬是無法打贏勝仗，唯有團結一心，結果就算不完美，我們心裡也是開心的，大學四年，有了這次經驗，沒有任你玩四年。

After this game, so I learned a lot of things deeply, both institutions thoughts and Features teams, or even for the entire body of creative ideas, time control and operation of proficiency, and allows us to do is to control and thinking, there are many parts, agencies are not giving much thought to the complete and efficient, and the other teams can do it, although we are not convinced, but see the other team carefully the past few months, presumablyis no night and day processing reprocessing, modify, to modify, to the disadvantage of all get rid of, and to maximize the advantages of this is my the finalists last eight teams deep worship and praise.

Way back to the road, with the expression of regret and lonely, but it can not hide our days and nights together efforts of a few months, purchase of materials, from the beginning until the back often because the processing to the school late at night twenty-three point, although we do not have short-listed the top eight, is really a great pity, if not for the second game of the motor gear loose, or we must into the top eight, but in the process, we learned together the ponderings ideas, is commendable, his face is sad, and my heart is throbbing, happy, exhausted we learned in the past three years of the St. John's University of Science and Technology professional subjects in our hearts, we are the first place because we have tried to do.

I think that the school run by the game, very meaningful, not only can inspire ideas, creativity and ideas of all students, but also allow us to discover the importance of teamwork, a team single-handedly winning the victory, the only unity results even if not perfect, our hearts are happy, four years in college With this experience, no matter how you play four years.