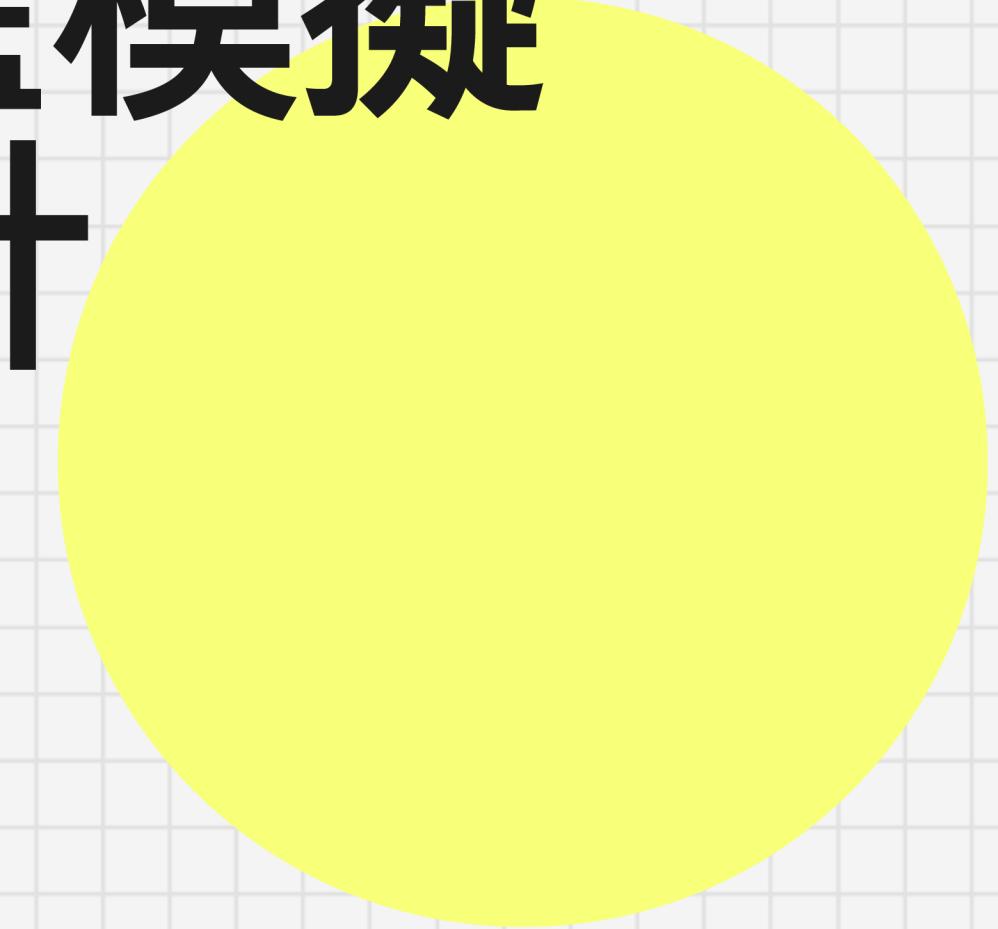
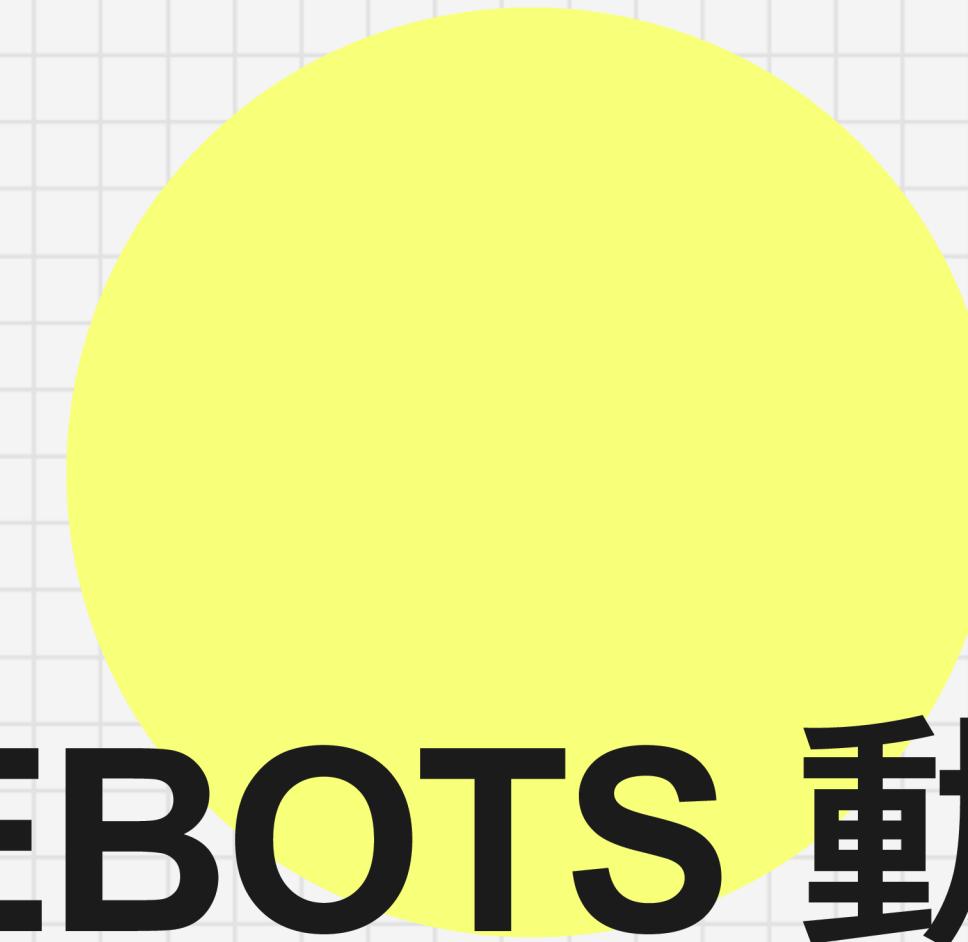


WEBOTS 動態投籃模擬 系統的協同設計

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41023109 洪于芳



目錄

- 簡介
- 學習內容
- 操作過程與問題
- 心得與討論

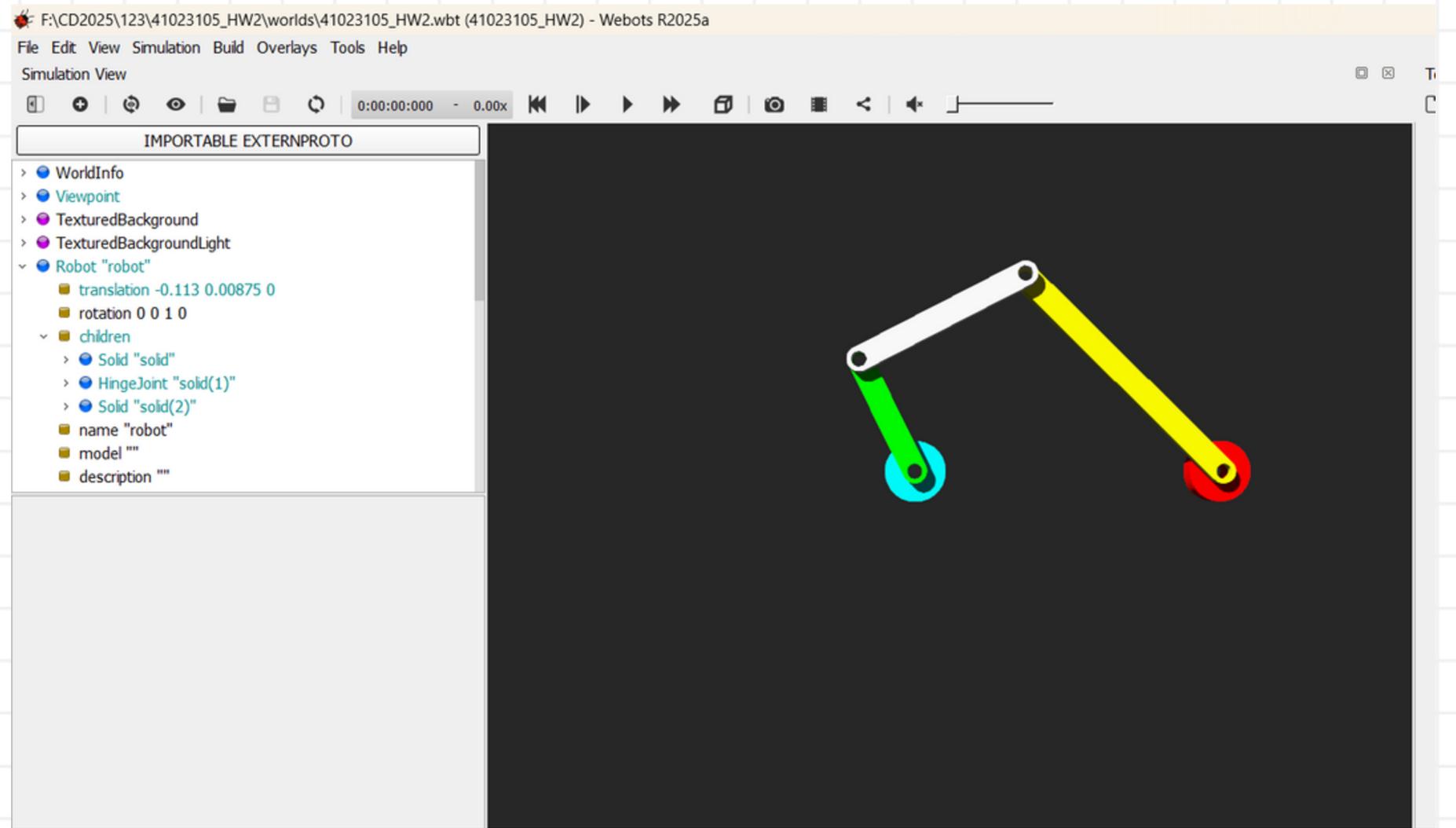
簡介



介紹在協同產品設計實習課程中如何利用webots 完成專案協同之過程，其中包括四連桿機構、投籃機、七段顯示器、底座車子模擬等主題與過程。

學習內容

四連趕機構



圖片為HW2

solvespace 繪製

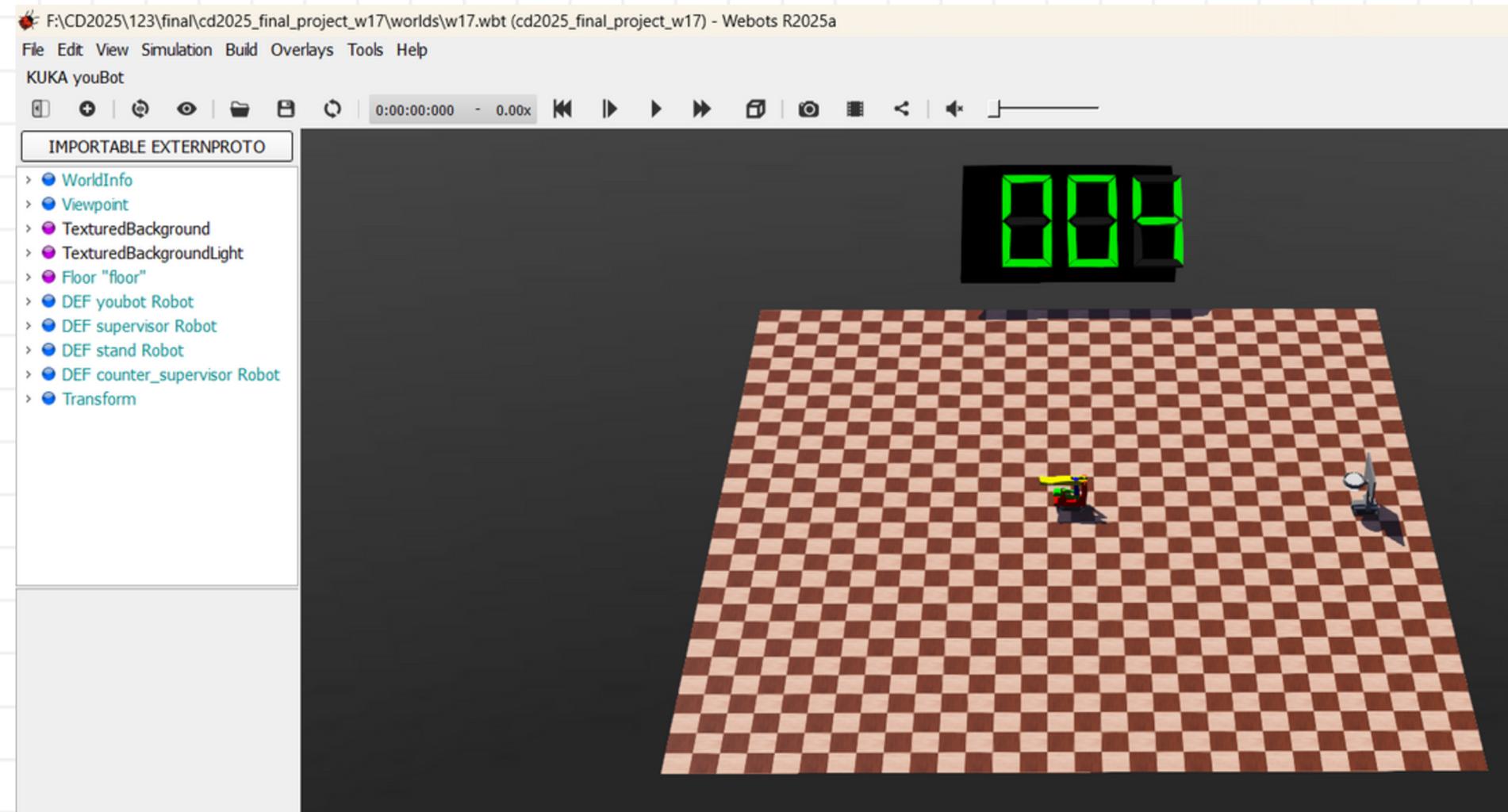
摸索webots學習如何開啟場景

學習在webots中學習組裝

如何利用程式碼啟動

學習內容

投籃機



嘗試如何利用 webotsw --stream
啟動 Webots 模擬系統

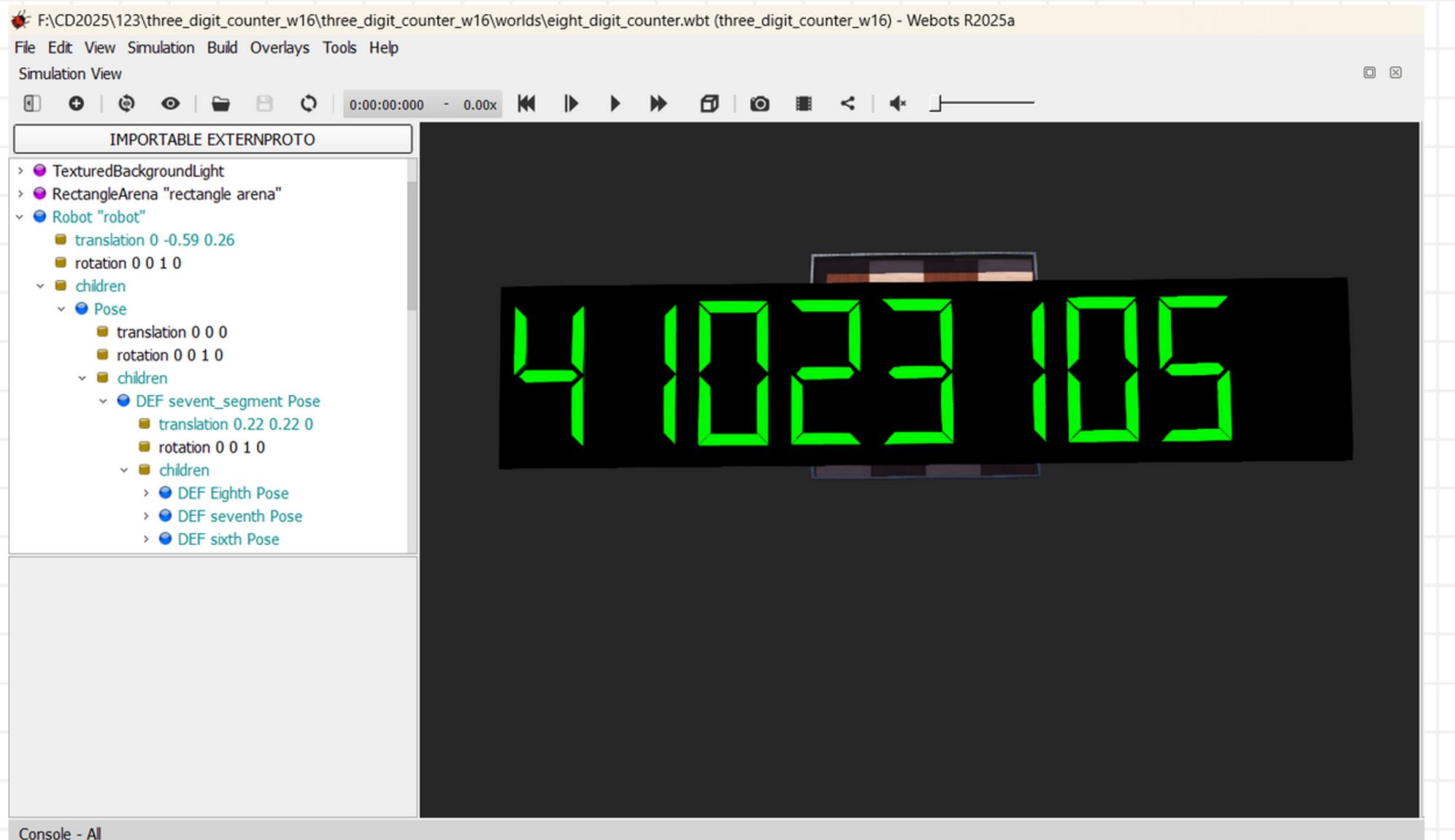
如何在客戶端檢視串流

如何控制及協同

程式內涵

學習內容

七段顯示器



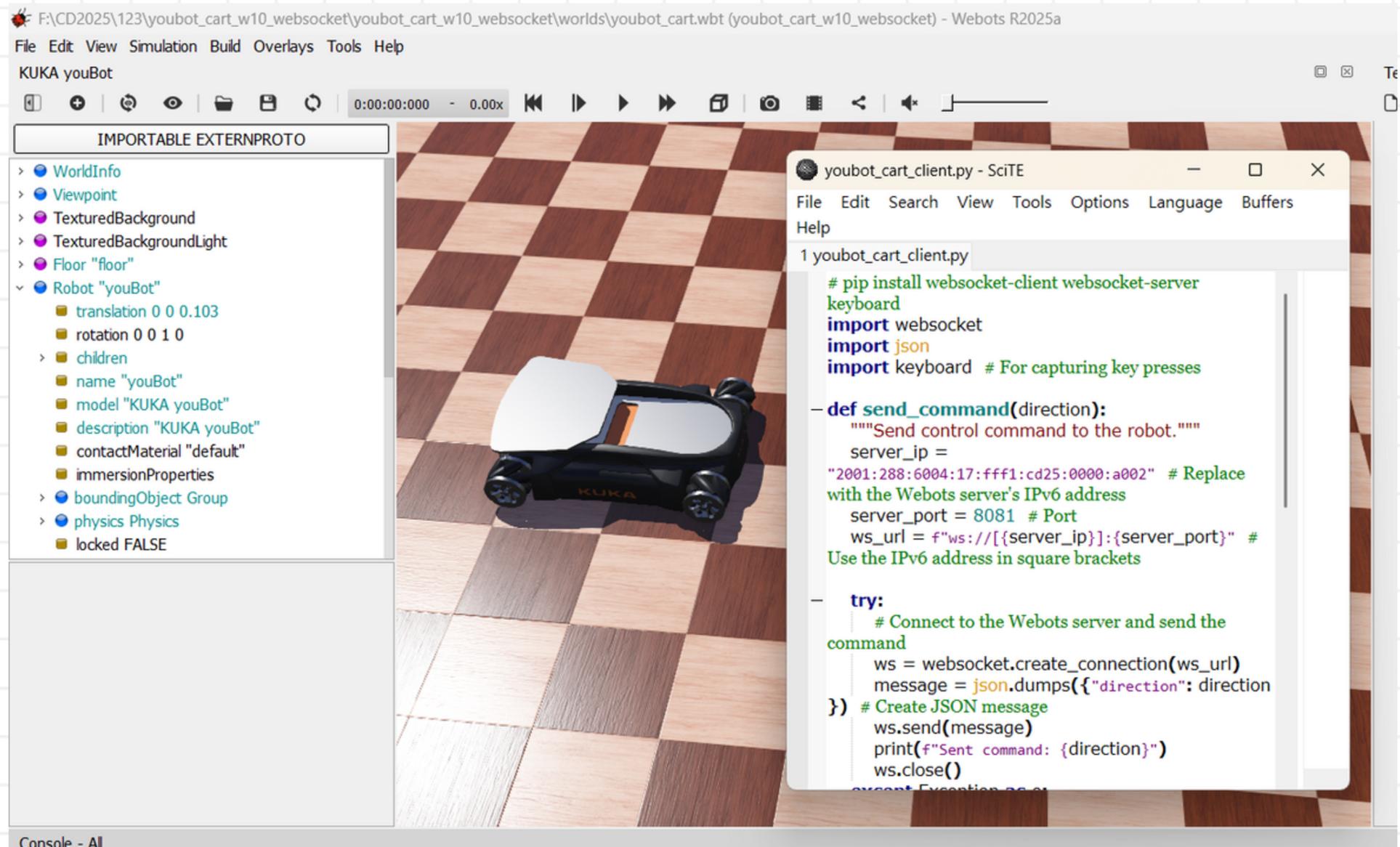
如何在結構上更改結構大小

加入其他五個pose

調整每個數字成為學號

程式碼更改成為自己學號可運作

學習內容 車子底座模擬



如何加入車子

如何使用個人 IPv6 網址來啟動 Webots 伺服器

學習解決遇到的問題

操作過程與問題

在完成籃球場要開啟SciTE 啟動串流卻一直遇到連中斷，電腦拒絕連線

F:\CD2025\123\youbot_cart_w10_websocket\youbot_cart_w10_websocket\worlds\youbot_cart.wbt (youbot_cart_w10_websocket) - Webots R2025a

File Edit View Simulation Build Overlays Tools Help

KUKA youBot

IMPORTABLE EXTERNPROTO

translation 0 0 0.103
rotation 0 0 1 0
> children

youbot_client.py - SciTE

File Edit Search View Tools Options Language Buffers Help

1 youbot_client.py

```
# pip install websocket-client
websocket-server keyboard
import websocket
import json
import keyboard # For capturing key presses

def send_command(direction):
    """Send control command to the robot."""
    server_ip = "2001:288:6004:17:ffff1:cd25:0000:a002" # Replace with the Webots server's IPv6 address
    server_port = 8081 # Port
    ws_url = f"ws://[{server_ip}]:{server_port}" # Use the IPv6 address in square brackets

    try:
        # Connect to the Webots server and send the command
        ws = websocket.create_connection(ws_url)
        message = json.dumps({"direction": direction}) # Create JSON message
        ws.send(message)
        print(f"Sent command: {direction}")
        ws.close()
    except Exception as e:
        print(f"Failed to send command {direction}: {e}")

def main():
    """Listen for arrow key presses and send commands."""
    print("Use arrow keys to control the robot (UP, DOWN, LEFT, RIGHT). Press 'ESC' to quit.")
    NFO: youbot extern controller: Waiting for local or remote connection on port 1234 targeting robot named 'youBot'.
```

>Process failed to respond; forcing abrupt termination...
>Exit code: 1
>pythonw.exe -u "youbot_cart_client.py"
Use arrow keys to control the robot (UP, DOWN, LEFT, RIGHT). Press 'ESC' to quit.
Failed to send command UP: [WinError 10061] 無法連線，因為目標電腦拒絕連線。
Failed to send command UP: [WinError 10061] 無法連線，因為目標電腦拒絕連線。
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>Process failed to respond; forcing abrupt termination...
>Exit code: 1
>pythonw.exe -u "youbot_cart_client.py"
Use arrow keys to control the robot (UP, DOWN, LEFT, RIGHT). Press 'ESC' to quit.
Failed to send command UP: [WinError 10061] 無法連線，因為目標電腦拒絕連線。
Failed to send command UP: [WinError 10061] 無法連線，因為目標電腦拒絕連線.

>Process failed to respond; forcing abrupt termination...
>Exit code: 1
>pythonw.exe -u "youbot_cart_client.py"
Use arrow keys to control the robot (UP, DOWN, LEFT, RIGHT). Press 'ESC' to quit.
Failed to send command LEFT: [WinError 10061] 無法連線，因為目標電腦拒絕連線.
Failed to send command RIGHT: [WinError 10061] 無法連線，因為目標電腦拒絕連線.
Failed to send command LEFT: [WinError 10061] 無法連線，因為目標電腦拒絕連線.
Failed to send command DOWN: [WinError 10061] 無法連線，因為目標電腦拒絕連線.
Failed to send command RIGHT: [WinError 10061] 無法連線，因為目標電腦拒絕連線.
Failed to send command DOWN: [WinError 10061] 無法連線，因為目標電腦拒絕連線.
Failed to send command DOWN: [WinError 10061] 無法連線，因為目標電腦拒絕連線.
Failed to send command DOWN: [WinError 10061] 無法連線，因為目標電腦拒絕連線.
Failed to send command LEFT: [WinError 10061] 無法連線，因為目標電腦拒絕連線.
Failed to send command DOWN: [WinError 10061] 無法連線，因為目標電腦拒絕連線.
Failed to send command LEFT: [WinError 10061] 無法連線，因為目標電腦拒絕連線.
Failed to send command LEFT: [WinError 10061] 無法連線，因為目標電腦拒絕連線.
Failed to send command LEFT: [WinError 10061] 無法連線，因為目標電腦拒絕連線.

'youBot'.

Text Editor

youbot_cart_server.py - SciTE

File Edit Search View Tools Options Language

1 youbot_cart_server.py

```
set_wheel_velocity(velocity, - velocity, velocity, - velocity)
elif direction == "STOP":
    set_wheel_velocity(0, 0, 0, 0)
except json.JSONDecodeError:
    print("Invalid message received. Expected JSON format.")
except Exception as e:
    print(f"Error handling message: {e}")

# WebSocket server thread
def start_websocket_server():
    """Start WebSocket server to receive control messages."""
    server_ip =
    "2001:288:6004:17:ffff1:cd25:0000:a002" #
    Replace with the Webots server's IPv6 address
    server_port = 8081 # Port to listen on

    try:
        server = IPv6WebSocketServer(host=server_ip, port=server_port)
        server.set_fn_message_received(on_message)
        print(f"WebSocket server started on [{server_ip}]:{server_port}, waiting for commands...")
        server.run_forever()
    except Exception as e:
        print(f"Failed to start WebSocket server: {e}")

    # Arrow key control thread
def start_arrow_key_control():
    """Listen for arrow key presses to control the robot."""
    print("Use arrow keys to control the robot.")
```

上網翻找資料詢問CPT也還是找不到問題

心得



這次課程從一開始學習如何組裝零組件到最後可以與組員一起投球，整體很有趣，但是我覺得我到後面還是跟不太上結尾，整個學期下來很明顯也能感受到自己真的學到了很多東西，這不只是單一框架的課程，除了專業的知識外，我還學到很多好用的軟體工具，更不用提那些軟實力的成長。、