

## Simple Code to Control Pioneer p3-DX with MATLAB & CoppeliaSim (Old V-Rep)

- Step 0: Create New Project File
- Step 1: Add Integration Files for Connect CoppeliaSim to MATLAB
  - Go To CoppeliaSim Installation Path: for Example: C:\Program Files\CoppeliaRobotics\CoppeliaSimEdu
  - Go to “Programming” Folder
  - Go to “remoteApiBindings” Folder
  - If We Use MATLAB To Control Then Go to “matlab” Folder and Again Open “matlab” Folder
  - Copy 3 Files:
    - remApi,m
    - remoteApiProto.m
    - simpleTest.m
  - Paste Them to your Project Folder
  - Go Back to “remoteApiBindings” Folder And Go to “lib” and Again “lib”
  - If We Use Windows Go to “Windows” and Copy “remoteApi.dll” to your Project Folder
- Step 2: Open CoppeliaSim & MATLAB
- Step 3: In CoppeliaSim Create New Scene
- Step 4: Add Pioneer p3-DX Robots to the World
- Step 5: Add a Cuboid to the World
- Step 6: Create a Perspective Vision Sensor and Set Directions
- Step 7: Create Script File
  - In Scene hierarchy Right Click to Cuboid Go to “Add” Next “Associated child script” Click “Non threaded”
  - Write `simRemoteApi.start(19999)` into

```
function sysCall_init()
    -- do some initialization here
end
```

- Step 8: Save Scene
- Step 9: Open MATLAB
- Step 10: Add your Project Folder in MATLAB Directory
- Step 11: Connection Test
  - Open “simpleTest.m” and Click Run and Go to CoppeliaSim Software
  - If you See Mouse Position in Matlab Command Window Mean Connection is Done
- Step 12: Back to MATLAB and Create a new Script
- Step 13: Write Some Necessary Code
  - Write :

```
sim=remApi('remoteApi');
sim.simxFinish(-1);
clientID=sim.simxStart('127.0.0.1',19999,true,true,5000,5);
if (clientID>-1)
    disp('connected')
end
sim.delete();
```
- Step 14 Lets Write Code
  - Get Object Handle (Command for Access to Object)  
Go to Website Blew and you Can See All Function Code:  
“<https://www.coppeliarobotics.com/helpFiles/en/remoteApiFunctionsMatlab.htm>”
    - Motors
      - Set Joint Target Velocity (for Motors)
    - Sensors
      - Read Proximity Sensor (for Sensors)

- Let's Exam Two Control Code
  - Pioneer1
    - ❖ Author: Mahdi Hajimohammadi
    - ❖ Sensor Using: 3
    - ❖ Turn Method: Reverse Wheel Turning
    - ❖ Sensor Calibration: Tuning
    - ❖ Sensibility : Medium
  - Pioneer2
    - ❖ Author: Mahdi Hajimohammadi (Convert Nikolai K. Python code Base to MATLAB code Base)
    - ❖ Sensor Using: All 16 Sensor
    - ❖ Turn Method: Increase or Decrease Left and Right Wheel's Velocity
    - ❖ Sensor Calibration: Tuning
    - ❖ Sensibility : Hight