

CV Pro – AI Kit
to build your
own Self-
Driving Car

CV Pro – The AI kit
for Autonomous
Navigation



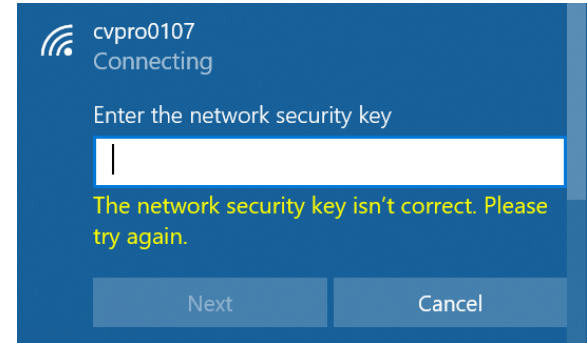
CV Pro – Troubleshooting

Error encountered: CV Pro unique ID **fails** to appear in the **Wi-Fi** list on your Windows OS.

Possible solution: Disable the firewall within Windows security and de-activate or turn-off the Domain, Public and Private networks.

Error encountered: Receive a notification that the 'network security key isn't correct.

Possible solution: Restart your computer and repeat the connection process. Re-enter the network security key as '12345678',



Error encountered: IPv4 address (192.168.4.2) is incorrect.

Possible solution:

- Check your network properties in Wi-Fi settings.
- Verify if your computer is strictly connected as the second device.
- Disconnect the existing connection and try to re-connect by following the steps to establish connection between CV Pro kit and computer.

Error encountered: `conda` is not recognized as internal or external command, while executing the command `my_conda`.

Possible solution: Check if you have installed, the `miniconda` in the `user profile path`.

```
C:\Users\User\Meritus-CVPRO-Windows\Meritus-CVPRO-main\Training_Process>my_conda
Hi! Please Ensure Internet Connection!
Give me a command - 'build' or 'activate' or 'deactivate': build
Creating a Virtual Environment:- cvpro ...
The system cannot find the path specified.
'conda' is not recognized as an internal or external command,
operable program or batch file.
Building the Environment...
Build failed.
```

Error encountered: 'Build failed'.

Possible solution: Re-enter the '**my_conda**' command and then select the '**build**' option.

```
Downloading and Extracting Packages:
Preparing transaction: done
Verifying transaction: done
Executing transaction: done
ERROR conda.core.link:_execute(945): An error occurred while installing package 'defaults::vs2015_runtime-14.27.29016-h5e58377_2'.
Rolling back transaction: done

[Errno 13] Permission denied: 'C:\\Users\\robot\\miniconda3\\envs\\cvpro\\msvcp140.dll'
()

Building the Environment...
Build failed.

(base) C:\\Users\\robot\\Meritus-CVPRO-Windows>
```

Error encountered: 'Installation failed',
after entering the command, 'install_cvpro'.

Possible solution: Check if you have
activated the environment using, '**build**' option
in the '**my_conda**' command.

```
Type 'run_cvpro' to move the Bot around for Data-Collection Process.
Type 'train_cvpro' to train the Bot for Autonomous Process.

C:\Users\robot\Meritus-CVPRO-Windows>install_cvpro
Do you have a valid Internet Connection? - 'y' or 'n': y
Installing dependencies.....
Requirement already satisfied: pip in c:\users\robot\miniconda3\envs\cvpro\lib\site-p
Fatal error in launcher: Unable to create process using '"C:\Users\robot\AppData\Loca
Python310\Scripts\pip.exe" install tensorflow~=2.9.0': The system cannot find the fi

Fatal error in launcher: Unable to create process using '"C:\Users\robot\AppData\Loca
Python310\Scripts\pip.exe" install -r requirements.txt': The system cannot find the f

Installation failed!

Check for the following:

1. Please ensure your Internet Connectivity is Stable.
2. Please ensure you have activated the 'cvpro' Environment.
3. Please ensure you have followed the execution steps in the order given.

C:\Users\robot\Meritus-CVPRO-Windows\Meritus-CVPRO-main\Environment_Setup>_
```

Error encountered: Installation of dependencies fails, after entering the command, 'install_cvpro'.

Possible solution: Follow the steps provided in the command instructions (highlighted in the given figure) and resolve the error. When resolved, re-enter the command, 'install_cvpro'.

```
WARNING: Retrying (Retry(total=2, connect=None, read=None, redirect=None, status=None)) after connection broken by 'NewConnectionError('<pip._vendor.urllib3.connection.HTTPConnection object at 0x00000280671368a0> failed to establish a new connection: [Errno 11001] getaddrinfo failed')': /simple/tqdm/
WARNING: Retrying (Retry(total=1, connect=None, read=None, redirect=None, status=None)) after connection broken by 'NewConnectionError('<pip._vendor.urllib3.connection.HTTPConnection object at 0x00000280671369a0> failed to establish a new connection: [Errno 11001] getaddrinfo failed')': /simple/tqdm/
WARNING: Retrying (Retry(total=1, connect=None, read=None, redirect=None, status=None)) after connection broken by 'NewConnectionError('<pip._vendor.urllib3.connection.HTTPConnection object at 0x0000028067136850> failed to establish a new connection: [Errno 11001] getaddrinfo failed')': /simple/tqdm/
WARNING: Retrying (Retry(total=0, connect=None, read=None, redirect=None, status=None)) after connection broken by 'NewConnectionError('<pip._vendor.urllib3.connection.HTTPConnection object at 0x0000028067136080> failed to establish a new connection: [Errno 11001] getaddrinfo failed')': /simple/tqdm/
ERROR: Could not find a version that satisfies the requirement tqdm (from versions: none)
ERROR: No matching distribution found for tqdm
Installation failed

Check for the following:
. Please ensure your Internet Connectivity is Stable.
. Please ensure you have activated the 'cvpro' Environment.
. Please ensure you have followed the execution steps in the order given.

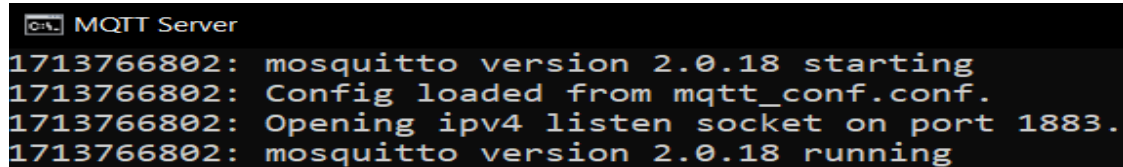
(c:\pro) C:\Users\robot\Meritus-CVPRO-Windows\Meritus-CVPRO-main\Environment_Setup
```

When the installation process is complete, ensure to enter the command, '**pip list**' and verify the listed python library versions with the requirements.txt file, available in the '%userProfile%\Meritus-CVPRO-Windows\Meritus-CVPRO-main\Environment_Setup'.

Error encountered: Server fails to start and there is no progress beyond the line, 'mosquitto version 2.0.18 running'.

Possible solution:

Check your Windows Firewall setting. If it is enabled, disable the settings. Then close the command prompt, disconnect from your Wi-Fi network and restart the computer. When computer has restarted, follow the process described to initiate the server again.



```
C:\> MQTT Server
1713766802: mosquitto version 2.0.18 starting
1713766802: Config loaded from mqtt_conf.conf.
1713766802: Opening ipv4 listen socket on port 1883.
1713766802: mosquitto version 2.0.18 running
```

Error encountered: The requested address is not valid in its context.

Possible solution:

- ✓ Check if IPv4 address is 192.168.4.2.
- ✓ Check if the CV Pro kit is connected with the computer.
- ✓ Check for order of connection, if it is followed (computer and then phone).
- ✓ Verify whether the appropriate CV Pro kit is linked to the computer. Ensure that both the unique ID of the CV Pro (e.g. cvpro101) and the SSID of your computer match precisely.

```
MQTT Server
1715064129: mosquitto version 2.0.18 starting
1715064129: Config loaded from mqtt_conf.conf.
1715064129: Opening ipv4 listen socket on port 1883.
1715064129: Error: The requested address is not valid in its context.

(cvpro) C:\Users\robot\Meritus-CVPRO-Windows\Meritus-CVPRO-main\Environment_Setup>
```

Error encountered (for windows OS): The system cannot find the path specified.

Possible solution: Check if you have installed the MQTT in C:\Program Files only.



```
C:\> MQTT Server
```

```
The system cannot find the path specified.
```

```
(cvpro) C:\Users\robot\Meritus-CVPRO-Windows\Meritus-CVPRO-main\Environment_Setup>_
```

Error encountered (for windows OS): Unable to open the config file 'mqtt_conf.conf'.

Possible solution: Check if the config file is found, only in '%userProfile%\Meritus-CVPRO-Windows\Meritus-CVPRO-main\Environment_Setup'.

MQTT Server

1715065260: Error: Unable to open config file mqtt_conf.conf.

(cvpro) C:\Users\robot\Meritus-CVPRO-Windows\Meritus-CVPRO-main\Environment_Setup>

Error encountered (for macOS): 'Address already in use', when connecting with server using 'launch_server' command.

Possible solution:

- Check if you have already connected with the server and it is in use.
- Check if MQTT is auto-connected.
- If either of the above is true, then close the MQTT server window (with error) and continue the process.

```
Last login: Tue May  7 12:18:49 on ttys000
printf "\e[1;MQTT Server\a"; mosquitto -v -c $HOME/Meritus-CVPRO-Mac/Meritus-CVPRO-main/Environment_Setup/mqtt_conf.conf
rajkumarselvaraj@Apple ~ % printf "\e[1;MQTT Server\a"; mosquitto -v -c $HOME/Meritus-CVPRO-Mac/Meritus-CVPRO-main/Environment_Setup/mqtt_conf.conf
1715064560: mosquitto version 2.0.18 starting
1715064560: Config loaded from /Users/rajkumarselvaraj/Meritus-CVPRO-Mac/Meritus-CVPRO-main/Environment_Setup/mqtt_conf.conf.
1715064560: Opening ipv4 listen socket on port 1883.
1715064560: Error: Address already in use
rajkumarselvaraj@Apple ~ %
```

Error encountered (for windowsOS): 'Only one usage of each socket address is normally permitted',
when connecting with server using 'launch_server' command.

Possible solution:

- Check if you have already connected with the server and it is in use.
- Check if MQTT is auto-connected.
- If either of the above is true, then close the MQTT server window (with error) and continue the process.

```
CV MQTT Server
1715066167: mosquitto version 2.0.18 starting
1715066167: Config loaded from mqtt_conf.conf.
1715066167: Opening ipv4 listen socket on port 1883.
1715066167: Error: Only one usage of each socket address (protocol/network address/port) is normally permitted.

C:\Users\robot\Meritus-CVPRO-Windows\Meritus-CVPRO-main\Environment_Setup>
```

Error encountered (for macOS): 'Command not found: mosquitto'.

Possible solution: Check if 'mosquitto' broker is installed in the 'user profile path' of your computer.

```
Environment_Setup — Installation of Libraries — -zsh — 80x24
.4.2 scipy-1.13.0 seaborn-0.13.2 six-1.16.0 threadpoolctl-3.5.0 tqdm-4.66.2 tzdata-2024.1 zipp-3.18.1

Installation is Completed!

For Data Collection Process:
-----
1. Please Disconnect the Internet, and connect the Bot with the System. Ensure the Connected IPv4 Address is: 192.168.4.2
2. Type 'launch_server' to Launch the MQTT Server to run the Bot!
3. Type 'run_cvpro' to begin the Data Collection Process!

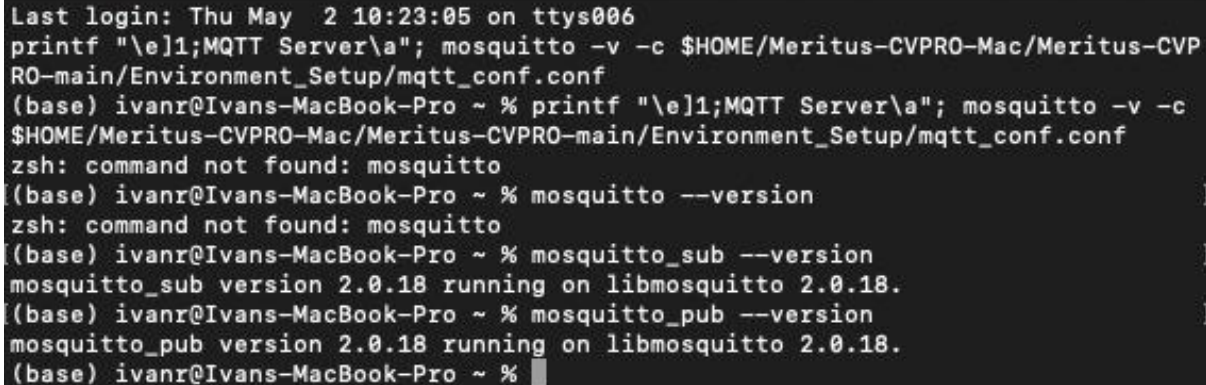
For Training Process:
-----
1. Ensure your Bot is disconnected from the System as well as the Application.
2. Type 'train_cvpro' to begin the Training Process!

(cvpro) ivanr@Ivans-MacBook-Pro Environment_Setup % launch_server
tab 1 of window id 17954
(cvpro) ivanr@Ivans-MacBook-Pro Environment_Setup % launch_server
tab 1 of window id 17968
(cvpro) ivanr@Ivans-MacBook-Pro Environment_Setup %
```

```
Last login: Thu May  2 10:23:05 on ttys006
printf "\e[1;MQTT Server\a"; mosquitto -v -c $HOME/Meritus-CVPRO-Mac/Meritus-CVPRO-main/Environment_Setup/mqtt_conf.conf
(base) ivanr@Ivans-MacBook-Pro ~ % printf "\e[1;MQTT Server\a"; mosquitto -v -c $HOME/Meritus-CVPRO-Mac/Meritus-CVPRO-main/Environment_Setup/mqtt_conf.conf
zsh: command not found: mosquitto
(base) ivanr@Ivans-MacBook-Pro ~ %
```

Error encountered (for macOS): Command not found: mosquitto, even after installing mosquitto broker.

Possible solution: Check if mosquitto is installed in your computer, 'in the user profile path'.



```
Last login: Thu May  2 10:23:05 on ttys006
printf "\e]1;MQTT Server\a"; mosquitto -v -c $HOME/Meritus-CVPRO-Mac/Meritus-CVP
RO-main/Environment_Setup/mqtt_conf.conf
(base) ivanr@Ivans-MacBook-Pro ~ % printf "\e]1;MQTT Server\a"; mosquitto -v -c
$HOME/Meritus-CVPRO-Mac/Meritus-CVPRO-main/Environment_Setup/mqtt_conf.conf
zsh: command not found: mosquitto
(base) ivanr@Ivans-MacBook-Pro ~ % mosquitto --version
zsh: command not found: mosquitto
(base) ivanr@Ivans-MacBook-Pro ~ % mosquitto_sub --version
mosquitto_sub version 2.0.18 running on libmosquitto 2.0.18.
(base) ivanr@Ivans-MacBook-Pro ~ % mosquitto_pub --version
mosquitto_pub version 2.0.18 running on libmosquitto 2.0.18.
(base) ivanr@Ivans-MacBook-Pro ~ %
```


Error encountered: 'Python not found', during data collection process. (when 'control' or 'videostream' option is given, under the command 'run_cvpro')

Possible solution: Check if you have activated the 'conda' environment.

CV: Data Collection Process

```
Enter your choice - 'control' or 'videostream': control
Is your Bot connected with the Application? - 'y' or 'n': y
Running the Bot.....
Python was not found; run without arguments to install from the Microsoft Store, or disable this shortcut from Settings > Manage App Execution Aliases.
Type 'run_cvpro' or 'train_cvpro' according to your requirement!
C:\Users\User\Meritus-CVPRO-Windows\Meritus-CVPRO-main\Controller>_
```

Error encountered: The CV Pro kit is not moving after entering the valid speed limit.

Possible solution:

1. Check if the Python version is only 3.9.19, and also you have activated the 'conda' environment using the 'my_conda' command.
2. Enter the command, 'pip list' and verify the listed python library versions with the requirements.txt file, available in the '%UserProfile%\Meritus-CVPRO-Windows\Meritus-CVPRO-main\Environment_Setup'.

```
C:\> Data Collection Process
Enter your choice - 'control' or 'videostream': control
Is your Bot connected with the Application? - 'y' or 'n': y
Running the Bot.....
pygame 2.4.0 (SDL 2.26.4, Python 3.9.19)
Hello from the pygame community. https://www.pygame.org/contribute.html
Enter a valid Speed Limit (170-255):220
Your Speed limit 220 --> 220
```

When you manually install, python libraries, (esp. 'paho-mqtt), you will encounter

Error encountered: 'Value Error: Unsupported callback API version'

Possible solution: Enter the command, '**pip list**' and verify the listed python library versions with the **requirements.txt** file, available in the '%userProfile%\Meritus-CVPRO-Windows\Meritus-CVPRO-main\Environment_Setup'.

If any mismatch found, re-build the environment, using the build option in my_conda command and use install_cvpro command.

Refer to the image given in the next slide.

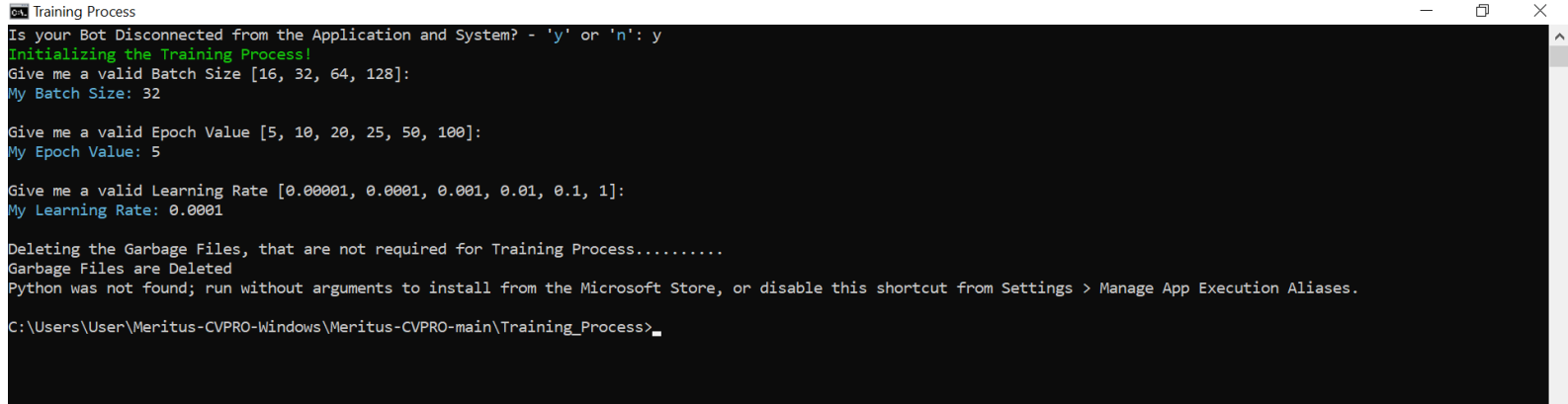
```
Traceback (most recent call last):
  File "C:\Users\robot\Meritus-CVPRO-Windows\Meritus-CVPRO-main\Controller\control_bot.py", line 349, in <module>
    run()
  File "C:\Users\robot\Meritus-CVPRO-Windows\Meritus-CVPRO-main\Controller\control_bot.py", line 334, in run
    client = connect_mqtt() # calling the Mqtt Connection
             ^^^^^^^^^^^^^^^^^
  File "C:\Users\robot\Meritus-CVPRO-Windows\Meritus-CVPRO-main\Controller\control_bot.py", line 179, in connect_mqtt
    client = mqtt_client.Client(CLIENT_ID)
             ^^^^^^^^^^^^^^^^^^^^^^^^^^^^^
  File "C:\Users\robot\AppData\Local\Programs\Python\Python311\Lib\site-packages\paho\mqtt\client.py", line 766, in __init__
    raise ValueError(
ValueError: Unsupported callback API version: version 2.0 added a callback_api_version, see migrations.md for details

Type 'run_cvpro' or 'train_cvpro' according to your requirement!

C:\Users\robot\Meritus-CVPRO-Windows\Meritus-CVPRO-main\Controller>_
```

Error encountered: 'Python not found', during training process. (when 'train_cvpro' command is given)

Possible solution: Check if you have activated the 'conda' environment.



```
CA Training Process
Is your Bot Disconnected from the Application and System? - 'y' or 'n': y
Initializing the Training Process!
Give me a valid Batch Size [16, 32, 64, 128]:
My Batch Size: 32

Give me a valid Epoch Value [5, 10, 20, 25, 50, 100]:
My Epoch Value: 5

Give me a valid Learning Rate [0.00001, 0.0001, 0.001, 0.01, 0.1, 1]:
My Learning Rate: 0.0001

Deleting the Garbage Files, that are not required for Training Process.....
Garbage Files are Deleted
Python was not found; run without arguments to install from the Microsoft Store, or disable this shortcut from Settings > Manage App Execution Aliases.

C:\Users\User\Meritus-CVPRO-Windows\Meritus-CVPRO-main\Training_Process>
```

Error encountered: 'NotADirectoryError', during training process.

Possible solution:

- Check if no files, apart from the extracted zip file (data collected) are found in the given path -

**%userProfile%\Meritus-CVPRO-Windows\Meritus-CVPRO-
main\Training_Process\Training_Data\Dataset_CVPRO\Autonomous_Driving**

For example the file can be - '20230920_110330'

- Navigate to the same path and open command prompt, by giving 'cmd' in the address bar and delete the existing file by entering the command, 'del <filename.???> for example, 'del bash.txt'.

Refer to the image given in the next slide.

```
Deleting the Garbage Files, that are not required for Training Process.....
Garbage Files are Deleted
Training Progress is Started...
Dataset_Folder : C:\Users\robot\Meritus-CVPRO-Windows\Meritus-CVPRO-main\Training_Process\Training_Data\Dataset_CVPRO\Autonomous_Driving
The Folder is not Present in List_Folder
Dataset_Folder : C:\Users\robot\Meritus-CVPRO-Windows\Meritus-CVPRO-main\Training_Process\Training_Data\Dataset_CVPRO\Image Classification
0%|
tatus : Current Directory -> C:\Users\robot\Meritus-CVPRO-Windows\Meritus-CVPRO-main\Training_Process\Training_Data\Dataset_CVPRO\Autonomous_Driving\20240215_124246\20240215_124232
CSV_Length : 1233
Video length : 1118
The CSV length - 1233 is greater, so limiting no. of frames to video frame length count - 1118

Status : Writing images and csv to output folder ...

Status : Completed writing outputs ! for Dataset_CVPRO\Autonomous_Driving\20240215_124246\20240215_124232
100%|
Data Pre-Processing Completed
Autonomous_Driving
Folder_Path:C:\Users\robot\Meritus-CVPRO-Windows\Meritus-CVPRO-main\Training_Process\Training_Data\Dataset_CVPRO\Autonomous_Driving\20240215_124246\20240215_124232\Controls_CSV\Fram.csv
Traceback (most recent call last):
  File "C:\Users\robot\Meritus-CVPRO-Windows\Meritus-CVPRO-main\Training_Process\main.py", line 77, in <module>
    save_df = preprocess.data_frame()
  File "C:\Users\robot\Meritus-CVPRO-Windows\Meritus-CVPRO-main\Training_Process\Utils\createdataset.py", line 261, in data_frame
    self.autonomous_driving(self.root_folder, folder, save_df)
  File "C:\Users\robot\Meritus-CVPRO-Windows\Meritus-CVPRO-main\Training_Process\Utils\createdataset.py", line 238, in autonomous_driving
    for dataset_folder in os.listdir(actual_dataset_path):
NotADirectoryError: [WinError 267] The directory name is invalid: 'C:\\Users\\robot\\Meritus-CVPRO-Windows\\Meritus-CVPRO-main\\Training_Process\\Training_Data\\Dataset_CVPRO\\Autonomous_Driving\\bash.txt'
```

Error encountered: `ModuleNotFoundError: No module named 'pygame'`, during data collection or training process.

Possible solution: Check if you have successfully installed the python libraries using the command, 'install_cvpro'.

```
CV Training Process
Is your Bot Disconnected from the Application and System? - 'y' or 'n': y
Initializing the Training Process!
Give me a valid Batch Size [16, 32, 64, 128]:
My Batch Size: 32
Give me a valid Epoch Value [5, 10, 20, 25, 50, 100]:
My Epoch Value: 5
Give me a valid Learning Rate [0.00001, 0.0001, 0.001, 0.01, 0.1, 1]:
My Learning Rate: 0.0001
Deleting the Garbage Files, that are not required for Training Process.....
Garbage Files are Deleted
Traceback (most recent call last):
  File "C:\Users\robot\Meritus-CVPRO-Windows\Meritus-CVPRO-main\Training_Process\main.py", line 23, in <module>
    from Utils.createdataset import CreateDataset
  File "C:\Users\robot\Meritus-CVPRO-Windows\Meritus-CVPRO-main\Training_Process\Utils\createdataset.py", line 15, in <module>
    import cv2
ModuleNotFoundError: No module named 'cv2'
(cvpro) C:\Users\robot\Meritus-CVPRO-Windows\Meritus-CVPRO-main\Training_Process>
```

```
CV Data Collection Process
Enter your choice - 'control' or 'videostream': control
Is your Bot connected with the Application? - 'y' or 'n': y
Running the Bot.....
Traceback (most recent call last):
  File "C:\Users\robot\Meritus-CVPRO-Windows\Meritus-CVPRO-main\Controller\control_bot.py", line 25, in <module>
    import pygame
ModuleNotFoundError: No module named 'pygame'
Type 'run_cvpro' or 'train_cvpro' according to your requirement!
(cvpro) C:\Users\robot\Meritus-CVPRO-Windows\Meritus-CVPRO-main\Controller>
```