

1.Introduction of API

Arm_Button_Mode(enable)

Function function: Set whether make the DOFBOT enters the study mode.

Parameter explanation:

enable: enable=0: means exit the study mode; enable=1: means enter the study mode.

After entering the study mode, the RGB light on the expansion board will show the state of breathing light, and the DOFBOT will automatically turn off the torque. You can change the angle of the DOFBOT manually.

Each time you press the K1 button on the expansion board, the breathing light will switch to another colors indicate that the currently angle of the DOFBOT has been recorded, and up to 20 sets of actions can be recorded.

When the number of recorded action sets exceeds 20 sets, we can't record actions by pressing the K1 key, and the breathing light will become red.

After exiting the learning mode, the robotic arm will automatically turn on the torque and turn off the RGB lights.

Return value: None.

2. The API corresponding to the number of currently action groups.

Arm_Read_Action_Num()

Function: Read the number of currently recorded action groups.

Parameter explanation: No.

Return value: Returns the number of currently recorded action groups.

3. The API corresponding to the running action groups.

Arm_Action_Mode(mode)

Function function: Run the recorded action group.

Parameter explanation:

mode: mode=0: stop running action group;

mode=1: single running action group;

mode=2: running action group in loop.

Return value: None.

4. The API corresponding to the clear action group.

Arm_Clear_Action()

Function function: clear the recorded action group, it cannot be restored after clearing.

Parameter explanation: No

Return value: None.

5. In the learning mode, the API corresponding to the learning action.

Arm_Action_Study()

Function: In the study mode, send a command to tell the expansion board to record the current posture of the DOFBOT as an action group.

Every action group, the RGB light breathing light effect will change color.

Parameter explanation:

Return value: None.

2. About code

Path: /home/dofbot/Dofbot/3.ctrl_Arm/8.study_mode.ipynb

```
#!/usr/bin/env python3
#coding=utf-8
import time
from Arm_Lib import Arm_Device

# Get DOFBOT object
Arm = Arm_Device()
time.sleep(.1)

# Open the study mode, the RGB light on the expansion board will keep breathing light, and all the
servos of the DFOBOT will close the torque.
# At this point, we can manually control the DFOBOT to complete some actions
Arm.Arm_Button_Mode(1)

# In the study mode, every time you run this cell, the current action is recorded and saved, and the
RGB lights on the expansion board will switch colors.
# If the red breathing light appears, it means that the learned action group is full (20 groups).
# This command can also be replaced by pressing the K1 button on the expansion board.
Arm.Arm_Action_Study()

# Close study mode and breathing light will be closed
Arm.Arm_Button_Mode(0)

# Read the number of currently recorded action groups
num = Arm.Arm_Read_Action_Num()
print(num)

# Run action group single
Arm.Arm_Action_Mode(1)

# Run action group in loop
Arm.Arm_Action_Mode(2)

# Stop action group
Arm.Arm_Action_Mode(0)

# Clear the action group, the RGB light on the expansion board will be green when the clearing is
completed.
# Note: Once the recorded action group is cleared, it cannot be restored.
Arm.Arm_Clear_Action()

del Arm    # Release DOFBOT object
```

Open the program file in jupyter lab, and click the run button on the toolbar, you can see that the RGB lights on the DOFBOT expansion board become red, green, and blue lights in cycles every 0.5 seconds.



After the study mode is opened, you can manually control the posture of the DOFBOT. Then, run `Arm.Arm_Action_Study()` or press the K1 button on the expansion board to record the current posture of the DOFBOT.

Then, run `Arm.Arm_Action_Study()` again or press the K1 button on the expansion board to record the current posture...

Next, close study mode.

Finally, you can run `Arm.Arm_Action_Mode(1)` or `Arm.Arm_Action_Mode(2)` to make DOFBOT complete custom actions.