

Program Autostart on Raspberry Pi

In this project, VSCADA software should be launched once GLV gets enough power to turn on Raspberry Pi as the car starts. This requires VSCADA program to be self-launched every time as raspberry boots. To achieve this, we found two methods to auto start program in Pi's start up

For Non-GUI script

Before VSCADA program runs, a command needs to be executed to connect Raspberry Pi with CAN network on the car. This command line does not involve any GUI functionalities. To let Raspberry Pi to run that command when it boots up, we put that line of command in `/etc/rc.local`.

Here is how to do it,

1. `sudo nano /etc/rc.local`
2. Add the command line before exit 0 line.

All the things in the `rc.local` would be executed as a root user by default. All the paths in your program should be absolute. It takes home path as `/home/pi`. All the commands before exit 0 line will be executed during system launch before graphic desktop is launched.

For GUI script

Since VSCADA is python program with its own GUI, we cannot use the method above, `rc.local` is executed too early before X-server runs. X-server is responsible for all GUI elements in Pi including its own graphic desktop user interface. To execute anything that uses GUI, the command line has to be added to LXDE autostart file.

Here is how to do it,

1. `sudo nano /etc/xdg/lxsession/LXDE-pi/autostart`
2. You should be able to see 3 lines in raspbian by default.
3. You can add a line at the end to execute your script. (For us , `@sudo python3 /home/pi/Desktop/VSCADA/getCANdata.py`)

This autostart method doesn't execute script or program as a root user by default. Sudo has to be added in front of the command. Theoretically, if you want to execute without showing desktop part, comment the first 3 lines by putting `#` in front of every line and adding another line after them will load other GUI programs instead of LXDE, but we did not skip desktop because it will be easier for us to run tests.

After adding command lines to `rc.local` and LXDE autostart file, every time Raspberry Pi boots, it will first connect to the CAN network, then run VSCADA program and show GUI where all the data is displayed in a table we laid out.