



Getting started with DDBOAT

- ▶ Use DDBOAT training for BEST Course of last year
- ▶ Build your teams
- ▶ Connecting to the DDBOAT
- ▶ First very simple program
- ▶ A bit more complex, program getting the GPS position
- ▶ Practice with the screen command to work without WIFI
- ▶ Acquiring GPS data and displaying it on a map (e.g. Google Earth)

- ▶ Each team will consist of 3 students
- ▶ At least one student should have a working ubuntu laptop
- ▶ Every team will be given a DDBOAT
- ▶ If number of students is not a multiple of 3, some teams may have 2 or 4 students

Talking to the DDBOAT

- ▶ The DDBoat is connected to the DARTAP WIFI network (for short range communication)
- ▶ DARTAP pswd is ABACA (network deliberately unsecure !)
- ▶ Each DDBoat has a fix IP address (172.20.25.2xx) with xx the boat number on 2 digits
- ▶ Example: for DDBoat 2, the IP address is 172.20.25.202

Connection test (1/2):

- ▶ Connect your laptop to the DARTAP WIFI network
- ▶ Open a terminal on Ubuntu (powershell on Windows) and type :
`ping 172.20.25.2xx` (replace xx by the boat number)
- ▶ You should see the ping responses from the DDBoat with a ping time less than 100ms
- ▶ Connect to the DDBoat main computer (Raspberry Pi) using SSH :
`ssh ue32@172.20.25.2xx` (password is ue32)

Connection test (2/2):

- ▶ Type `ls -l` to see the files on the DDBoat, you should see the folders of the previous ROB students
- ▶ Define a pseudo for your team (e.g. RobX) and create a folder for your team :
`mkdir RobX`
- ▶ You can go in your folder with :
`cd RobX`
- ▶ Keep the SSH connection open, we will use it later to execute Python programs on the DDBoat

First very simple program

The program `test.py` will just print the message "Hi!" on the screen.

- ▶ Open the file `test.py` with the editor of your choice
- ▶ Type the following code :

```
print("Hi!")
```

- ▶ Open a second terminal and copy the program from your laptop to your team folder (e.g. Robx) on the DDBoat using the command :
`scp test.py ue32@172.20.25.2xx:RobX/` (replace xx by the boat number and RobX by your folder name)
- ▶ The program is now on the DDBoat, go back to the previous terminal where you are connected to the DDBoat
- ▶ Run the program with the command : `python3 test.py`
- ▶ You should see the message "Hi!" on the screen

A bit more complex program

The program `gps.py` will read the GPS position from the GPS receiver of the DDBOAT and print it on the screen.

- ▶ We need the GPS driver, `gps_driver_v2.py`, to read the GPS data
- ▶ To get it you will have to clone the GitLab repository of the DDBoat drivers :
`git clone`
<https://gitlab.ensta-bretagne.fr/zerrbe/drivers-ddboat-v2.git>
- ▶ This will create a folder, `drivers-ddboat-v2`, containing all the drivers (GPS, IMU, motors, etc.)
- ▶ To use it, you will have to copy the file `gps_driver_v2.py` in your team folder (e.g. RobX) on the DDBoat using the command :
`scp drivers-ddboat-v2/gps_driver_v2.py ue32@172.20.25.2xx:RobX/`
- ▶ Then, you can use the BEST Course tutorial to get help on how to acquire the GPS data and display it on a map (e.g. Google Earth)

- ▶ The DDBoat WIFI network (DARTAP) is not accessible on the whole school site, and this will be the same for long missions at the lake of Guerlédan
- ▶ If your python program is running and write text on the terminal screen, and if the WIFI connection is lost, the program will block at the print ...
- ▶ ... this will stop the acquisition of the GPS and, on more complex programs, the control of the DDBOAT will freeze
- ▶ To avoid this problem, you can use the `screen` command
- ▶ You will find how to use the `screen` command in the README.md file of the GitLab repository of the DDBoat drivers :

<https://gitlab.ensta-bretagne.fr/zerrbe/drivers-ddboat-v2/README.md>

Acquiring GPS data and displaying it on a map

- ▶ If you need to copy multiple files on the DDBoat, you can copy a whole folder with `-r` option :
`scp -r myfolder ue32@172.20.25.2xx:RobX/`
to copy the whole folder myfolder in your team folder (e.g. RobX)
- ▶ You will find on the BEST Course tutorial how to acquire GPS data and create a KML file or a GPX file to display the GPS data on a map (e.g. Google Earth or Geoportail)
- ▶ You can make a first small test on the walking path on the east side of E006 room
- ▶ For the full mission, you can either go around the flag or make a round trip of the stadium track (you will need to use the `screen` command to avoid problems if the WIFI connection is lost)
- ▶ If this is done, the lab is over !