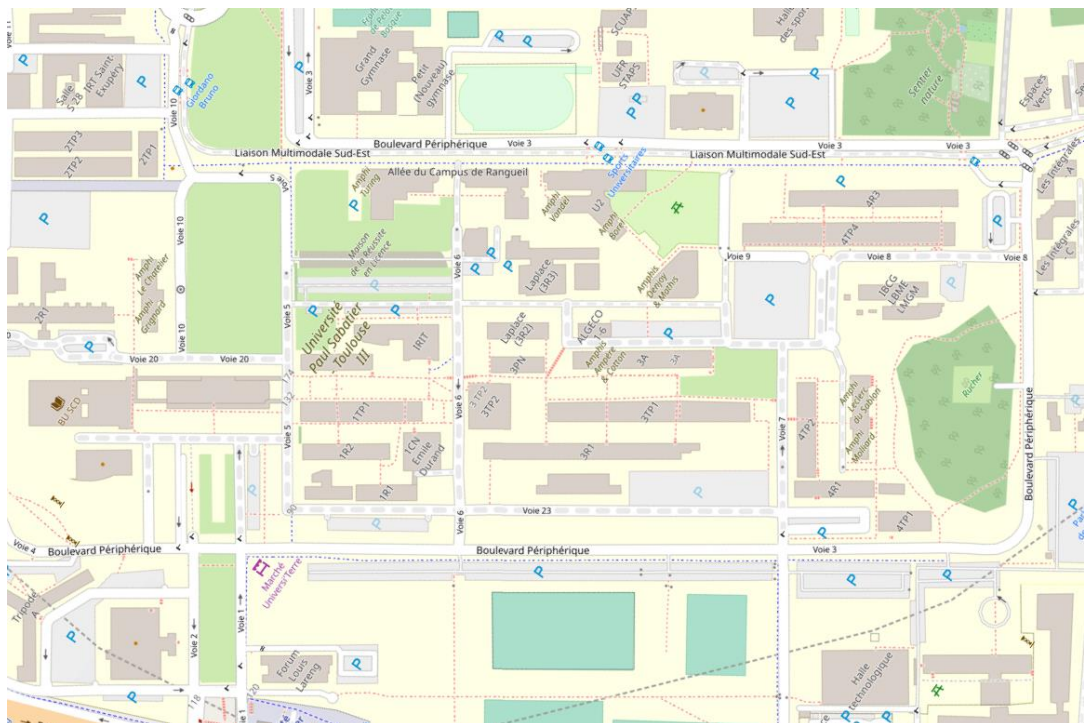


User Manual

UPSRouteService app

Routing application for the Paul Sabatier University Campus



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I. Physical Setup

Before you launch the application, make sure that you have a *Logitech Brio Ultra HD webcam* connected to your computer's USB port and that its drivers are up to date. Then make sure that the camera is placed 80cm above the center of your map model.

Next, make sure that the corners of your model contain the following Topcodes and that they are visible:

- Top left: number 31
- Bottom left: number 61
- Bottom right: number 47

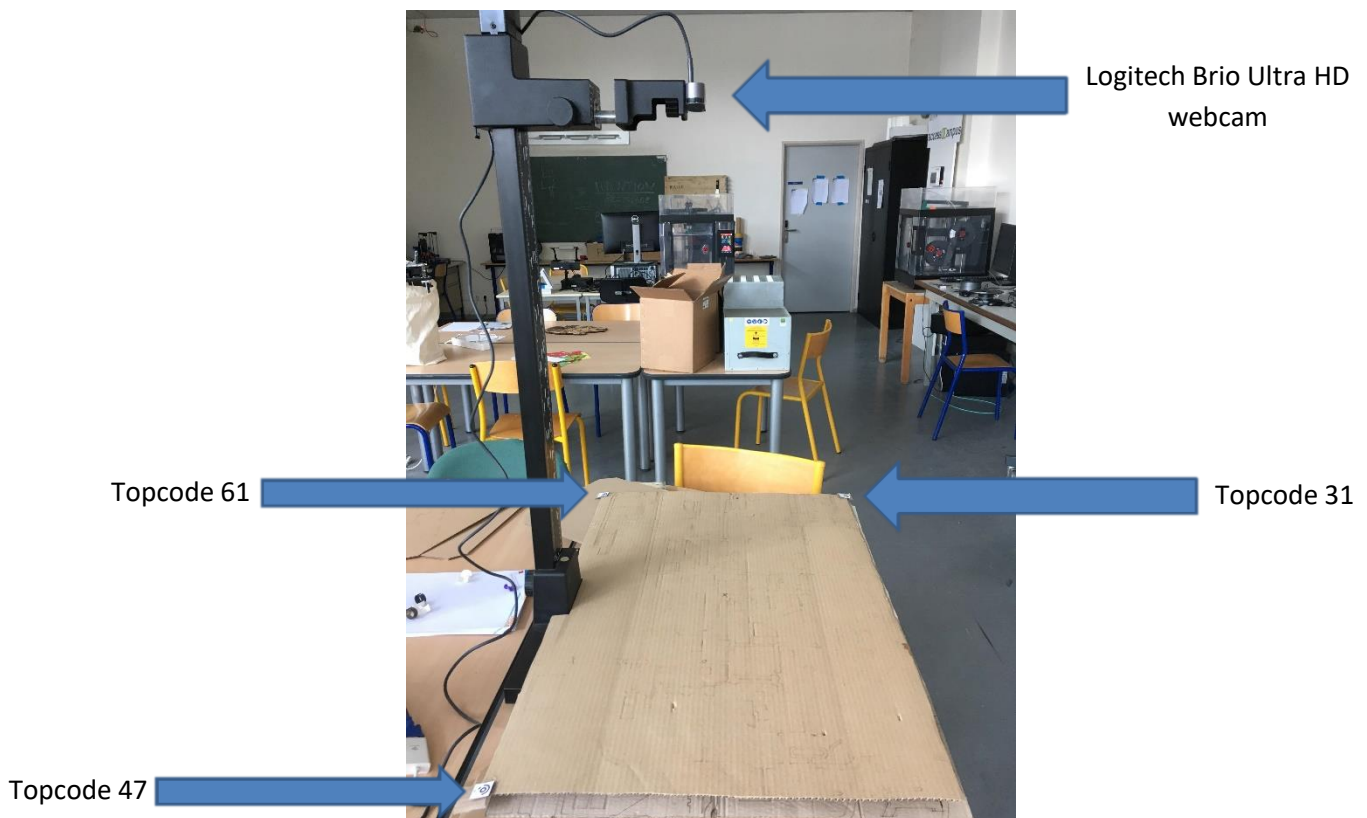


Figure 1 : Physical setup needed for the app to run

II. How to use the application after launch

When you first launch the app, two windows will appear. The first is the *Map of the UPS Campus* with a path already drawn on it. For more information on this window, go to part **B**.

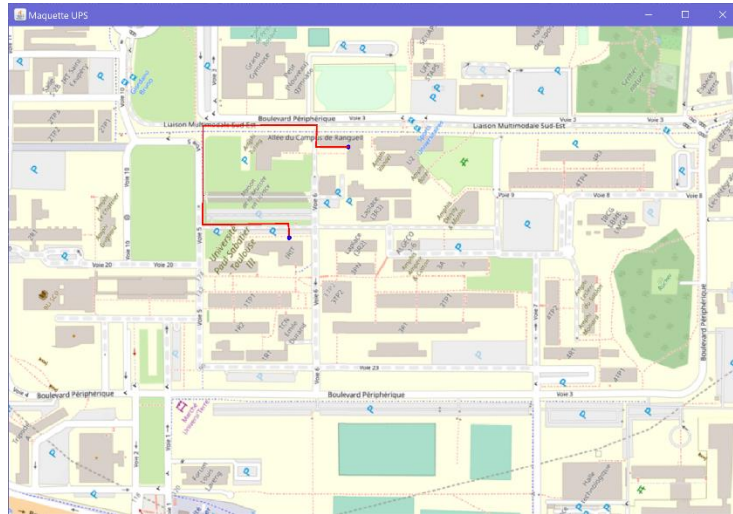


Figure 2 : Map window on launch

The other window that opens is the *Navigation Mode Window*. It allows the user to switch between the three different modes of the app: calibration, navigation and camera. For more information on these modes, see part **A**.

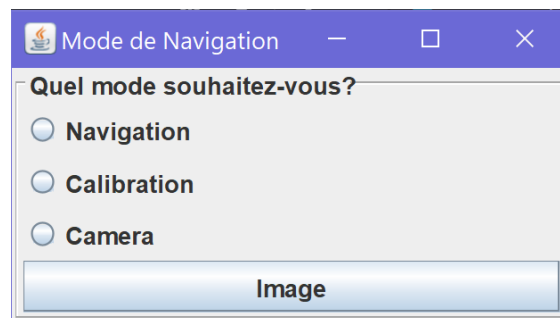


Figure 3 : Navigation mode window

The “Image” button at the bottom allows the user to remove the map image from the window, replacing it with a black screen, for projection. If pressed right after launch, the map window will look like this:

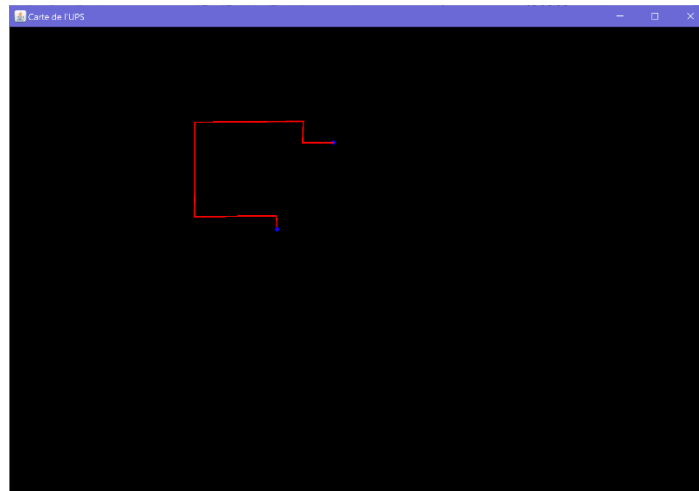


Figure 4 : Map window, without the map image in the background

Both windows will stay open at all times. You can switch modes whenever you like.

A. The different modes to use the app

There are three different mode options in the *Navigation Mode Window*. **Calibration** allows the user to modify the GPS coordinates of the corners of the map. **Navigation** lets the user find paths between buildings using only the computer. **Camera** mode uses the camera, map model, projector and topcodes to help the user find his way around campus.

1. The calibration mode

In order for the software to draw the different points of a path on the *Map of the UPS Campus* window, it needs to know the GPS coordinates of the top left, bottom left and bottom right corners of the map. If you notice that some points seem further off than they should be, you can use the *Calibration* window to set it right.

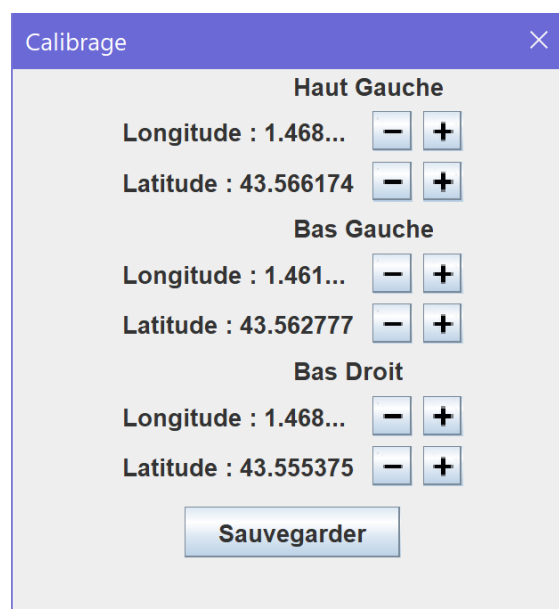


Figure 5 : Calibration window

Once the calibration is correct, press the **Save** button. Your settings will be saved in a file and you won't need to calibrate again next time you open up the software.

2. The navigation mode

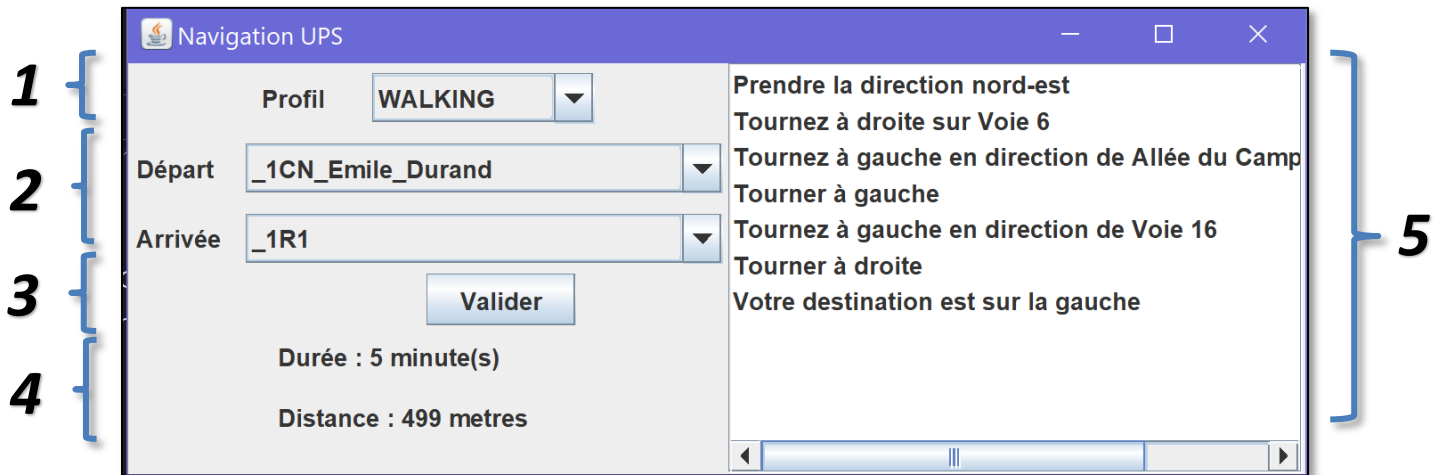


Figure 6: Navigation window allows the user to manually choose start and end points

- (1) The first thing the user can choose in the *Navigation* window is his means of transportation in the **Profile** drop-down menu. He can choose whether he is **on foot**, **cycling** or **in a wheelchair**.
- (2) He can then choose which building will be his point of **Departure** and which one will be his point of **Arrival** in two drop-down menus.
- (3) The **Validate** button will draw the chosen path on the map and update the path information.
- (4) Once a path has been chosen, its length and the time it'll take the user to take it will be displayed here.
- (5) The different instructions to take the path are displayed here. The user can **click** on a specific instruction and it will be highlighted on the map (Figure) and said out loud.

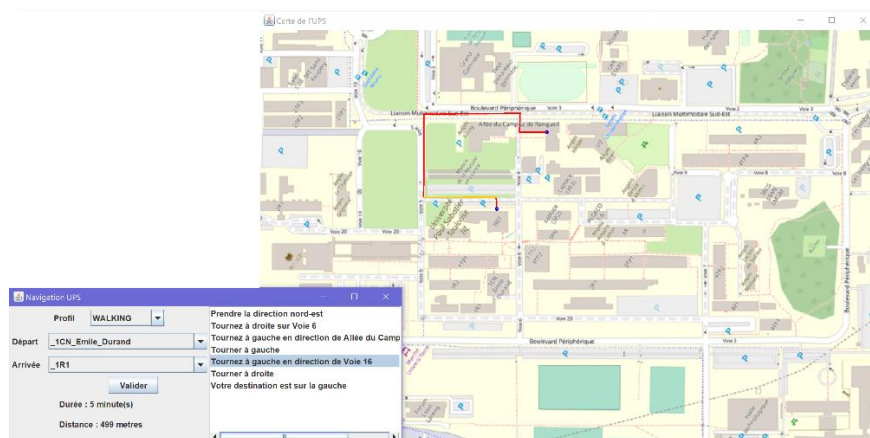


Figure 7 : Map with a highlighted instruction on the path

3. The camera mode

After clicking on the **Camera** mode, the webcam will turn itself on and the *Camera View* window will open. Make sure that the corners topcodes are visible and that they are highlighted in red by the camera. If not, move them. A *Camera Mode* window will also open, allowing the user to choose between and **Exploration** mode or **Navigation** mode along with a **Validate** button.

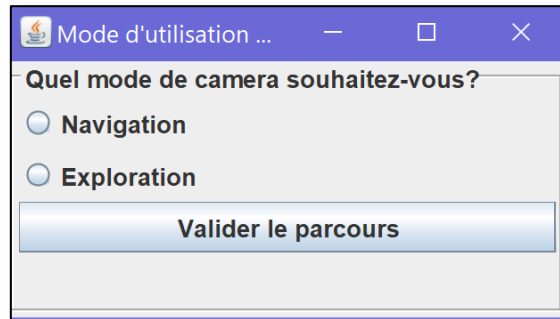


Figure 8 : Camera mode window

i. Camera exploration mode – to discover the map

The exploration mode allows the user to move topcode number 59 around the map (**Figure**), which will then be displayed on the *Map of the UPS Campus* window along with a tag saying the name of the building (**Figure**), which will also be said out loud over the speakers.

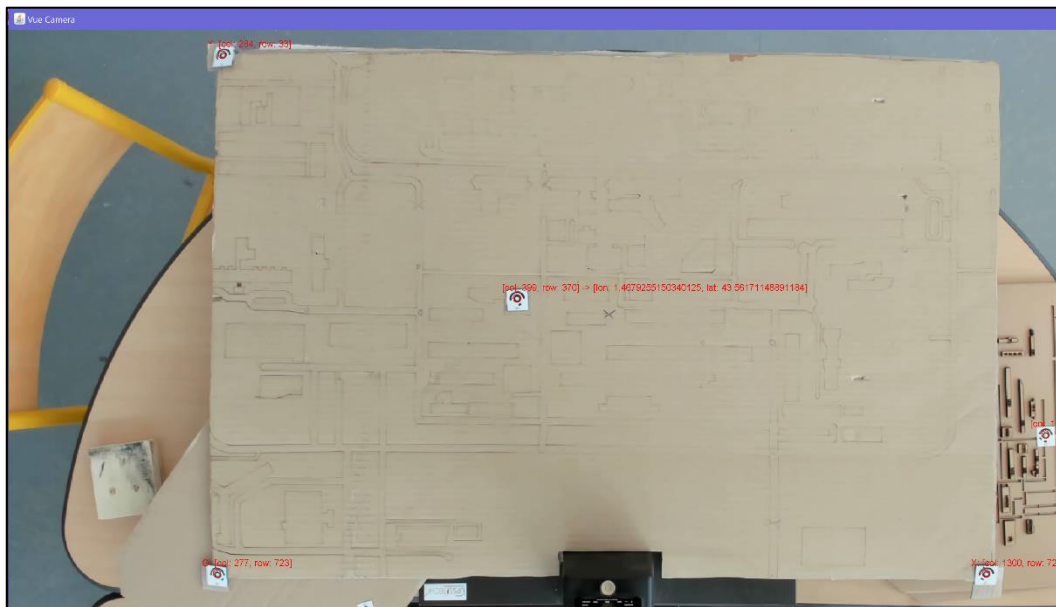


Figure 9 : Camera view in exploration mode

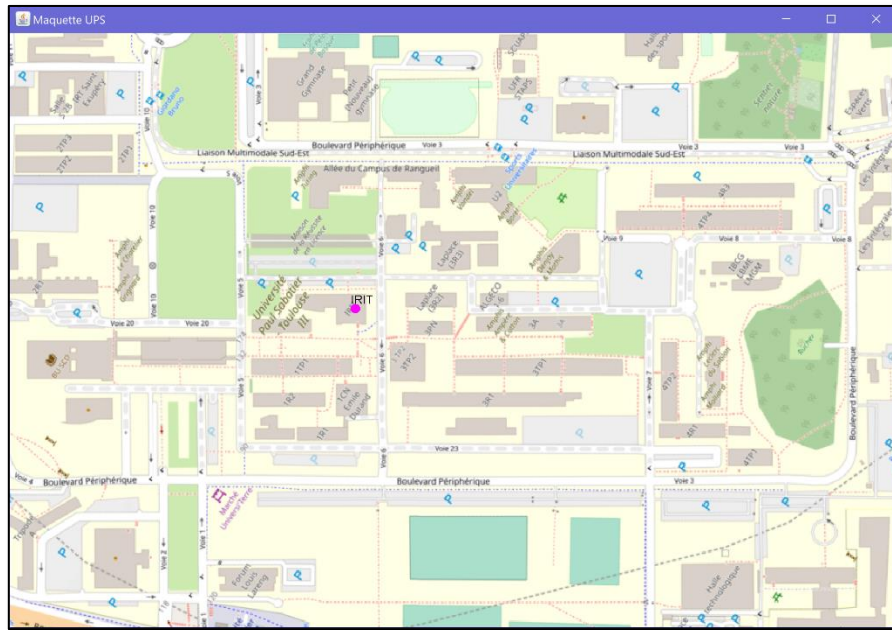


Figure 10 : Map of the UPS Campus window with exploration point corresponding to camera view

ii. Camera guiding mode – to choose a path and follow it

By placing topcode number 87 as a starting point and number 55 as an end point on the model, the *Camera View* window will display their GPS coordinates (**Figure**) and draw the path on the *Map of the UPS Campus* window (**Figure**). An *Instruction Window* will open (**Figure**), to display the information of the path.

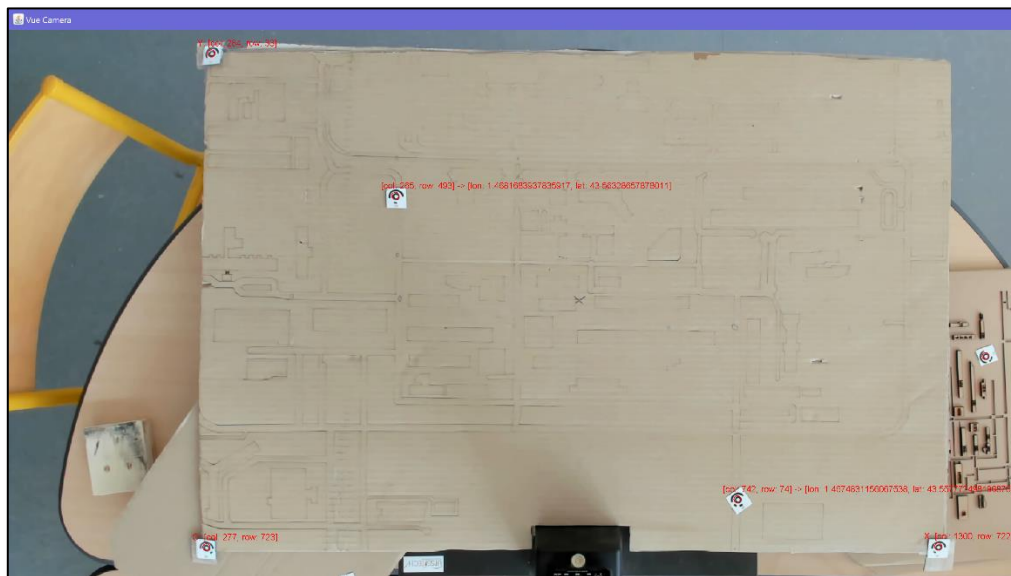


Figure 11 : Camera View window with start and end points

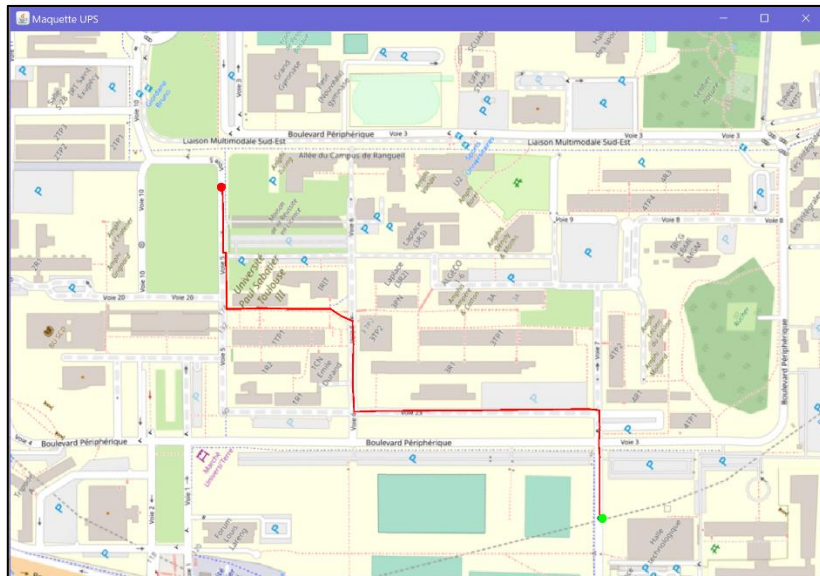


Figure 12 : Map of the UPS Campus window with path corresponding to camera view

Instruction UPS	
Départ :	Prendre la direction nord-est
Arrivée :	Tournez à gauche en direction de Voie 23
	Tournez à droite sur Voie 6
	Tourner à gauche
	Tourner légèrement à gauche
Durée : 10 minute(s)	Tourner à droite
	Tournez à gauche en direction de Voie 16
	Tournez à droite sur Voie 5
Distance : 843 metres	Votre destination est sur la gauche

Figure 13 : Instruction window corresponding to camera view

Once the user is happy with the placement of the start and end points, he will need to press the **Validate** button on the *Camera Mode* window. This will start the **guiding mode**. The end point won't move anymore.

Once the path has been validated, on each step of the course an instruction will be said out loud to the user to guide him. On **Figure** you can see that topcode number 87 has turned black on the map, it will be able to move along the path (which won't change). The next step is a small black point on the path. If the user moves away from the path he will be urged to turn back and after a while the path will be recalculated.

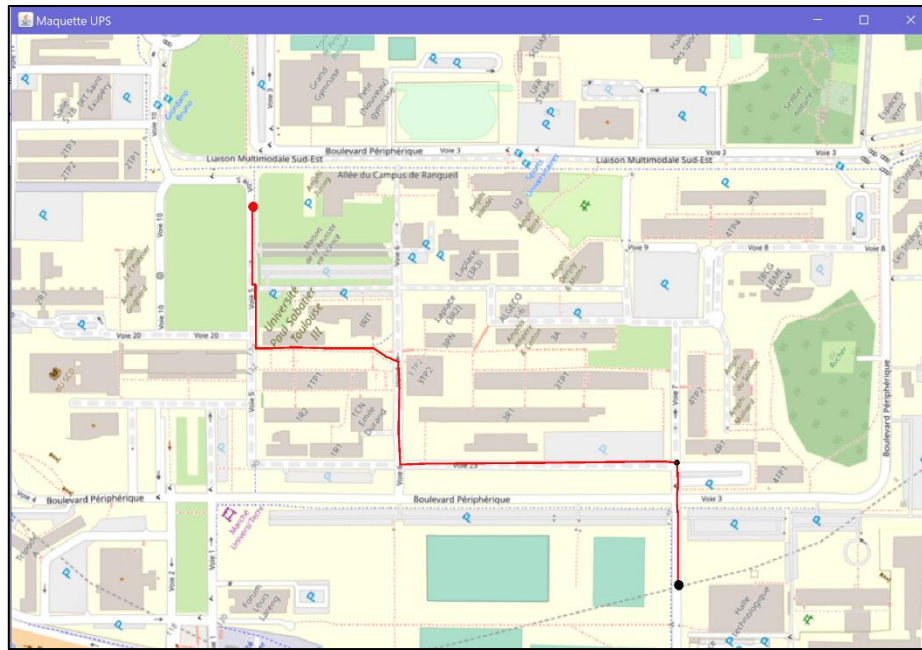


Figure 14 : Map of the UPS Campus window once the path has been validated

B. The map window

Since the Map of the UPS Campus window is used on every level of the application, this part of the manual will recap all the different points and colors that will appear on it and what they mean.

- Green dot** ● → Point of departure in ii. Camera guiding mode – to choose a path and follow it
- Red dot** ● → Point of arrival in ii. Camera guiding mode – to choose a path and follow it
- Magenta dot** ● → Exploration point in i. Camera exploration mode – to discover the map along with a text label
- Black dot (large)** ● → Location of the user during ii. Camera guiding mode – to choose a path and follow it
- (small)** ● → Next step on the path of the user in ii. Camera guiding mode – to choose a path and follow it
- Blue dot (small)** ● → Start and end points of the path in B. The navigation mode
- Red line** — → Path between an end and departure point in B. The navigation mode and C. The camera mode
- Text label** → The mouse has been clicked on the map and the name of the building has been displayed

To put the map to full screen, press the F key on the keyboard.