



**VITIROVER**  
SOLUTIONS

A unique teaching aid

# THE AUTONOMOUS SOLAR MOWER ROBOT





# VITIROVER

is a

breakthrough innovation

for servicing  
green spaces

It is the first industrial

autonomous solar mower robot

and the best

Substitute for glyphosate

VITIROVER is a remotely controlled autonomous robot.  
It generates the lowest ecological impact  
for a high precision result



**Vitirover technologies are based upon high level patents and know-how.**



**100% autonomous**  
Solar Panel  
Li-ion Battery



**Very low consumption**  
1 Watt per Kilo



**High precision**  
Mow up to 1cm from  
the obstacle



**Real Time Geolocation**  
GNSS (GALILEO,  
GLONASS, BAIDOU,  
GPS), SBAS



**Business Model :  
Service Provider**  
Set-up fees  
+ Monthly Plan





# VITIROVER

A case study that can be adapted to cutting-edge and trendy technical topics for students, based upon an industrial well appreciated robot.

#ConnectedRobot

#EnergyManagement

#MobilityManagement

IA & Machine Learning

Programming : From NoCode through C++

Connectivity / IoT / Fog Computing

Low Consumption System

Sensors & Binocular RGB Cameras

Web Platform & SAAS (versatile)

Fully loaded Mechatronics

Renewable energy / Solar Panel

Rechargeable & Fixable batteries

Best navigation management

Autonomous 4WD vehicle

Geolocation (Optional LIDAR Mapping)

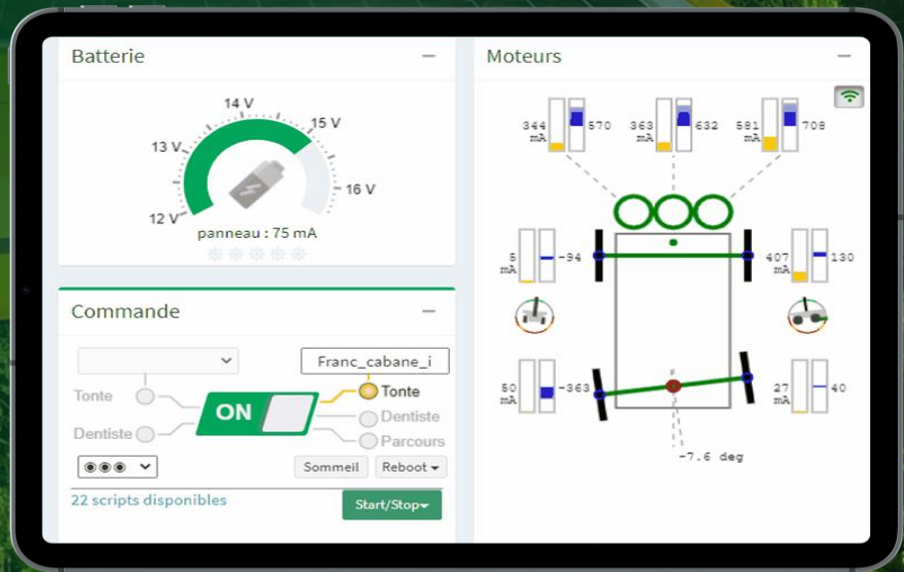
Rover & Space or Military Applications

Space servicing by robots fleets



# VITIROVER

A unique  
autonomous & connected  
outdoor robot



## IA & Machine Learning

Thanks to the analysis of its own operating data and of the fleet working on the same space (mowed vegetation, traffic, consumption, etc.), Vitirover records the specificities of the maintained spaces and adapts its behavior to improve its efficiency.

## Web Platform & SAAS

The robots fleet manager remotely overviews the robot's work and journey on a smartphone or tablet. He can take over through the web platform and view images from the on-board cameras. All parameters (battery, motors etc.) can be viewed on a live dashboard or in exported reports.

## Connectivity & IoT

The robots are connected to a cloud allowing to manage their operating system. This connectivity allows to operate the robots in a fleet or to substitute one for the other without losing the history of their progress.





# VITIROVER

## An Energy Management reference



The energy required to operate Vitirover must be stored in a Li-ion battery. It is therefore important to consume this energy in the most frugal way. A charged battery allows Vitirover to operate for 16 hours. Its integrated solar panel allows it to recover up to 5 hours of autonomy per day. A charging dock station allows rapid recharging from the mains.

Last but not least, thanks to an additional solar charging station to which the robot automatically connects to, in the event of low batteries, it will regain a capacity of 16 hours of work per day after approximately 8 hours of charging.

All this data can turn into case studies to have your students work on the following subjects :

- **Energy consumption**
- **Renewal Energy**
- **Rechargeable and Fixable Batteries**





# VITIROVER

## Travel / Move Management and Optimization



### **An Outdoor Robot**

The most famous "Rovers" are those that circulate on the moon and on Mars. There are very few "Outdoor" 4WD robots like Vitirover, autonomous and remotely controllable, that can also serve as a development platform for earth applications, such as aerospace or military.

### **Mapping**

Mapping applications are strongly growing and are becoming key to all innovative technologies.

Vitirover applications include the precise mapping of spaces such as vineyards, photovoltaic parks, orchards, railway lines or motorway edges, etc.

### **Sensors**

In addition to the mapping data, sensors such as cameras, Lidars or ultrasounds, provide a complement allowing to guide the robot in a much more precise way, or to improve its functions.





# VITIROVER

## Learning by doing



Among other things, Vitirover will be a very user friendly and fun motivating tool for practical use and learning of programming languages such as C, C++, Python or even simply in Scratch Language.

The robot allows different navigation strategies to be tested. Those can be refined by the use of AI since the robot records all the data of its movements.

The robot is provided with a basic content that can be developed by the students according to objectives set by the teacher or even according to the challenges set by the Vitirover company.





**VITIROVER**  
SOLUTIONS

**A UNIQUE TEACHING AID**

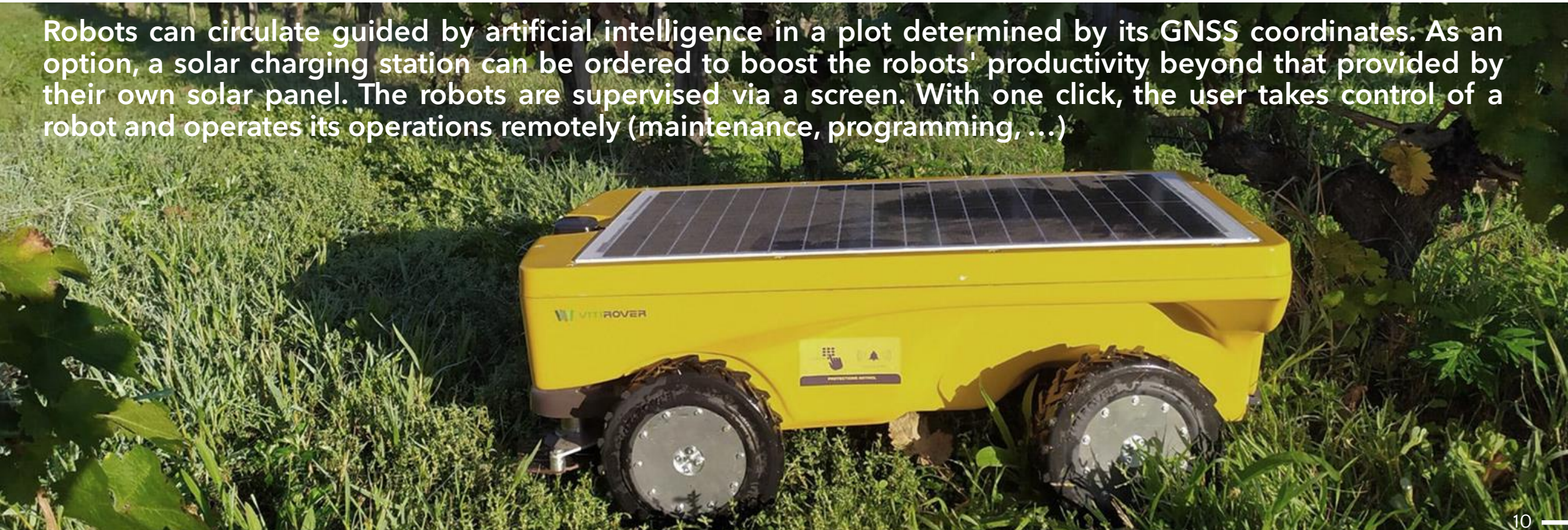
# APPENDIX





**The Vitirover company, created in 2010**, designs, manufactures and markets solar-powered, autonomous, 4WD, connected industrial robots for professional use in the maintenance of vegetation, replacing herbicides and conventional mowing machines using fossil fuels. The light adaptation of the professional robot makes it possible to offer educational support from June 2023 for establishments such as Engineering Schools, Universities and High Schools

Robots can circulate guided by artificial intelligence in a plot determined by its GNSS coordinates. As an option, a solar charging station can be ordered to boost the robots' productivity beyond that provided by their own solar panel. The robots are supervised via a screen. With one click, the user takes control of a robot and operates its operations remotely (maintenance, programming, ...)







Railways



Electric transformers



Vineyards



Motorways



Photovoltaic sites

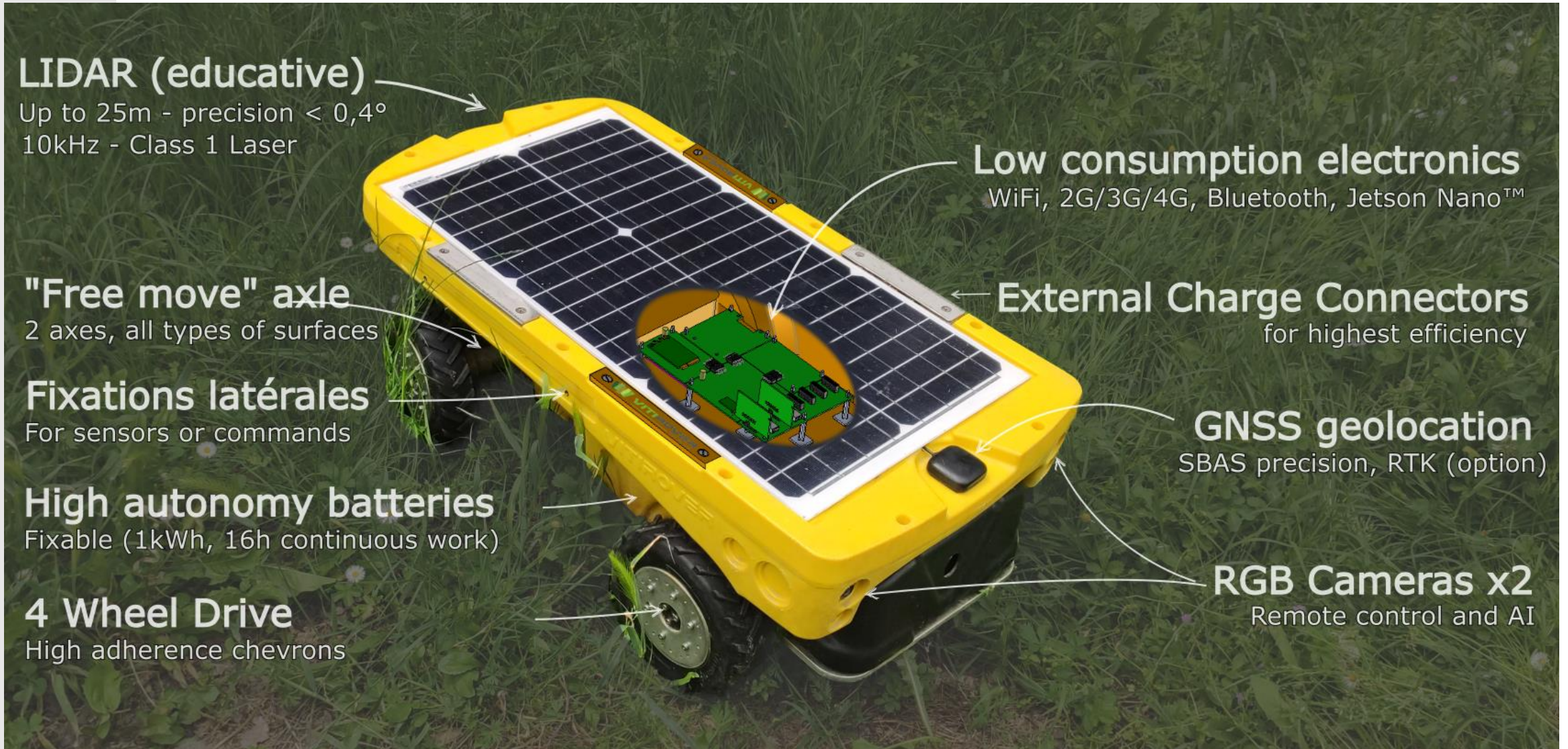


Orchards



Airports







**DIMENSIONS / WEIGHT**

- Length x Width x Height : 75cm x 40cm x 30cm
- Weight : 25 kg.

**MOVEMENT**

- Autonomous : Move Management Software for full covering of the piece of land
- Smart : detects obstacles to cut grass around, less than 1cm away from that obstacle (zero risk of hurting any obstacle)
- Wheel drive: 4
- Motor : 1 motor per wheel (total : 4)
- Max Slope: 15%-20% depending on soil
- Max Speed : 900m/hour

**MOWING SYSTEM**

- All kinds of grass
- Cutting block : rotating grinders (blades not mounted)
- Cutting Width : 30cm
- Cutting height : Adjustable from 5 up to 10 cm
- Precision : < 1 cm from the obstacle.

**SENSORS**

- 2 front RGB cameras
- IMU

**CHARGING**

- Plugged on a solar docking station or direct power supply

**POWER SUPPLY**

- Main : 1 solar panel and rechargeable battery
- Consumption : ~1W/kg

**GNSS SYSTEM**

- 2 GPS systems in the robot
- Detection precision : metric (GPS, GLONASS, BEIDOU, GALILEO) or centimetric (option RTK)

**WEATHER RESISTANCE**

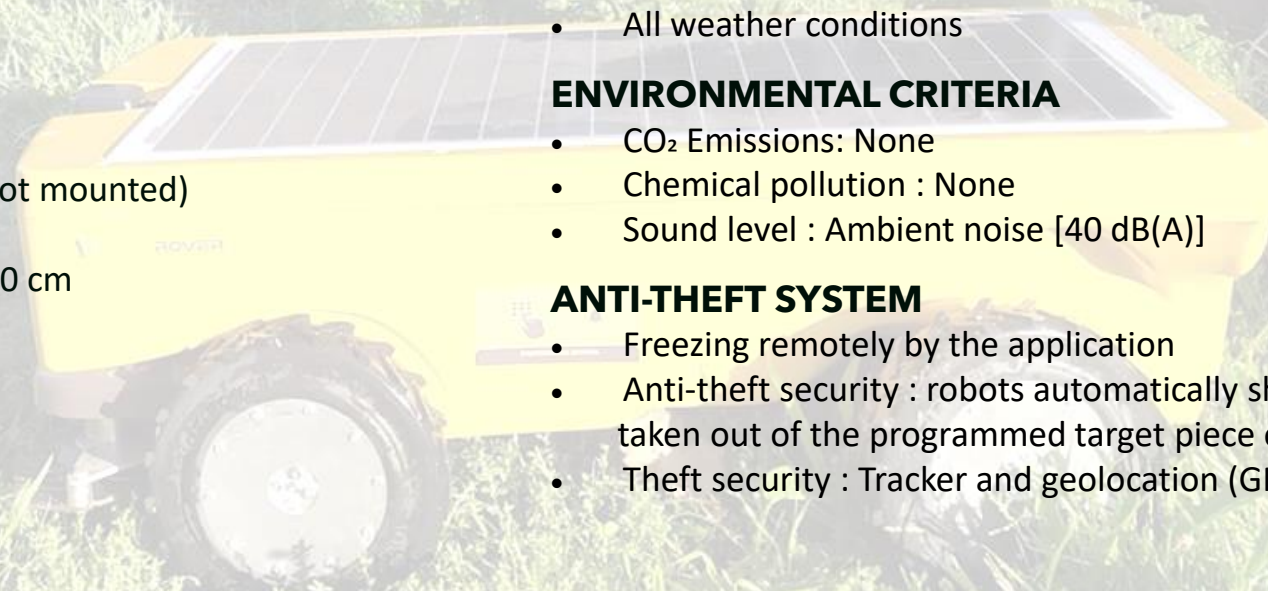
- All weather conditions

**ENVIRONMENTAL CRITERIA**

- CO<sub>2</sub> Emissions: None
- Chemical pollution : None
- Sound level : Ambient noise [40 dB(A)]

**ANTI-THEFT SYSTEM**

- Freezing remotely by the application
- Anti-theft security : robots automatically shut down when lifted or taken out of the programmed target piece of land
- Theft security : Tracker and geolocation (GNSS with specific battery)







### EDUCATIONAL BOARD

- Power supply: 5 Volts
- Link with educational electronics: API via USB
- API: protobuf or JSON of your choice
- Jetson Nano (with GPU for AI)
- Raspberry Pi compatible

### ROBOT OPERATING SYSTEM

- ROS2-compatible

### MOTOR CONTROL

- Individual or high level order

### EXAMPLE PROGRAMS

- C++ and Python

### MISCELLANEOUS

- Documentation, tutorial and community available on Github
- Open source

### INFORMATIONS AVAILABLE VIA THE API

- GNSS (centimeter if available)
- IMU (accelerometer, magnetometer, gyroscope)
- Voltage, Rotation and Energy spent of all motors
- Solar panel voltage
- Battery information
- Rear axle rotation

### INFORMATIONS AVAILABLE BY USB

- 2 front RGB Cameras

### OPTIONAL SENSORS

- LIDAR
- Ultrasonic sensors







# VITIROVER

IN A NUTSHELL

## VITIROVER robot's CSR impact

- ✓ is a real substitute for herbicides, plowing and fossil fuels
- ✓ It eliminates strenuous work and creates rewarding jobs
- ✓ It runs on solar energy and optimizes the use of its energy
- ✓ It does not compact the soil, it contributes to the renaturation of artificial soils and promotes biodiversity
- ✓ It is designed in a logic of circular economy and programmed sustainability
- ✓ It is manufactured north of Bordeaux, so it contributes to the reindustrialization of French regions





# Génération ROBOTS

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