

Internships / Theses

(m/f/d)



Robotics start-up is looking for **students** enthusiastic about innovative, herbicide-free and **automated solutions for weed control** in grassland (full or part-time).

What we offer

- Participation in agricultural robotics projects (e.g. in the domains of navigation, human-machine interaction, CAD or PCB design)
- Individual supervisor for your area of specialization
- Startup feeling: lots of team activities and flat hierarchies
- Possibility of permanent employment
- Market salary

Open positions

Software

- Autonomy and perception (p. 2)
- Real-time fleet supervision notifications (p. 2)
- Keypoint extraction from drone images (p. 3)

Electronics

- Development of a (semi) automated PCB testing system (p. 4)
- Onboard diagnostics tool for displaying system faults (p. 4)
- Solar tracking system (p. 5)

Mechanics

- Conception and construction of an attachment for tractors (p. 6)

Other

- If you have other ideas, don't hesitate to contact us. We're always open for interesting suggestions!

Autonomy and perception

As we advance with our robot's autonomous navigation capabilities, our operating domain expands from empty fields to fields with obstacles. These include static objects such as tree trunks, fences and stones, as well as dynamic obstacles such as people and livestock. To allow the operation of our robots in these situations, we wish to integrate visual sensors that aid in our path planning.

Your profile:

Computer science, robotics or electrical engineer

Experience with:

- ROS (our products use ROS2 Humble). Experience with the Nav2 stack is a plus.
- Embedded computers and Linux.
- Visual sensors such as RGB cameras, depth cameras and/or LIDAR.

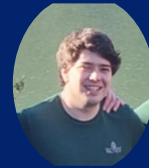
Your tasks:

- Research on regulations regarding autonomous agricultural vehicles in the EU (e.g. ISO 18497).
- Select and test different sensors in the lab and on the field.
- Integrate perception solutions into our robot's behavior tree using the Nav2 library.

Lucas Alvarez

Navigation & Localization

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Real-time fleet supervision notifications

Autonomous operation is one of the main goals we want to achieve with our robots. Therefore, long distance supervision of the operation of our robots is required. To achieve this, our fleet must be able to send real-time notifications of each robot's operating status: state of charge, in-route obstacles, state of the motors, among others.

Your profile:

- Computer science engineer or similar coursework.
- Experience with REST APIs.
- Experience with cloud deployment is a plus.

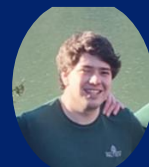
Your tasks:

- Develop a definition system for creating new notifications without technical expertise.
- Create a module for generating notifications with our fleet management software.
- Write integrations for SMS and Telegram.

Lucas Alvarez

Navigation & Localization

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Keypoint extraction from drone images

One of our main objectives is that our robots are autonomous and can move in the terrain in an optimal way. For this it is essential to have a map of the terrain. In order to obtain this map, we have drones that capture images of the terrain, which must be joined to reconstruct the map. It is essential that this reconstruction of the map is as fast as possible, since without this map it is not possible to start the operation of the robots.

Your profile:

- Experience in computer vision and image processing.
- Experience in python programming.

Your tasks:

- Literature review to find what is the state of the art in the industry.
- Develop an image stitching algorithm with images overlapping by no more than 40% and having GPS information.
- Optimize the algorithm to achieve the required efficiency.
- Capture new images using drones.

Diego Balada

Computer Vision & DL

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Development of (semi) automated testing systems

To aid in ramping up production of our products, we are looking to automate the testing process of our electronic systems. These systems operate from PCBs which are usually assembled and programmed in-house. This project requires defining a test interface and developing tools for quickly testing the correct operation of both power and logical electronic systems.

Your profile:

Electrical engineering or comparable course of study.

Experience with:

- EDA tools such as KiCad, Altium, Eagle or similar.
- Programming microcontrollers (C/C++ is a must)

Your tasks:

- Study and become familiar with our existing electronic systems.
- Design and develop internal tooling that aim to streamline the testing process of existing circuits in the system:
- Circuit design, PCB layout design and assembly.
- Write scripts to automate the testing process of our electronic systems.

Tomás Diaz

Electronics

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Solar tracking system (electrical - mechanical)

We wish to develop a smart system for optimizing the use of solar panels on our robots. These are regularly deployed on fields during the daytime and preliminary analysis shows that solar technology could expand our autonomy by up to 40%.

Your profile:

Mechanics, mechatronics, electrical engineer or comparable course of study.

Experience with:

- CAD design software such as Fusion 360 or Autodesk Inventor.
- Practical experience with assembling prototypes.
- Knowledge regarding embedded systems is a plus.

Your tasks:

- Prototype a mechanical system for rotating our solar panel setup.
- Perform real-time sun tracking with our onboard sensors.
- Gather data on performance and energy savings, with a visualization for each robot.

Tomás Diaz

Electronics

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Onboard diagnostics tool for displaying system faults

We wish to develop an onboard tool that facilitates error reading in our electrical system. Many errors can arise during operation and maintenance, therefore a way of communicating to the user is mandatory in order to take action. This tool must communicate via the CAN bus with the rest of the system and is required to deliver and display a specific error code to be read by the user.

Your profile:

Electrical engineering or comparable course of study.

Experience with:

- EDA tools (KiCad is preferred).
- Programming microcontrollers (C/C++ is preferred).

Your tasks:

- Develop a framework for writing rules to generate error messages based on existing diagnostic variables in our robot.
- Establish requirements for the electrical circuit that will read the error messages and display them.
- Design circuit schematic that satisfies requirements and complies with security standards.
- Design the PCB and integrate it into the system.

Tomás Díaz

Electronics

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Conception and construction of an attachment a tractor

The weed control mechanism of our robot is to be integrated into an attachment for tractors. In this way, even heavily weeded areas can be freed from weeds economically in the future.

Your profile:

Mechanical engineering, mechatronics or comparable course of study.

Experience with:

- CAD construction (Fusion 360, Inventor or similar)
- Cattle farms is highly welcome

Your tasks:

- Support in the design of an attachment for the tractor
- Creation of a hazard analysis and risk assessment (HARA) and a failure mode and effects analysis (FMEA)
- Preparation of a detailed geometric model of the planned attachment

Felix Schiegg

Co-Founder

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