



Internships/ IDPs / Theses

(m/f/d)

Robotics start-up is looking for students enthusiastic about 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

- Drone-Based Terrain Mapping with SfM (p. 2)
- Computer Vision: Exploring RGB-D and Multispectral Imaging (p. 2)
- Autonomy and perception (p. 3)
- Web Development: Customer Portal (p. 3)
- Fighting Cyber Threats (p. 4)

Electronics

- Simplifying Connections (p. 4)
- Robotics Charging Systems Design (p. 5)

Other

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

Please send your application including your CV and a short description of relevant practical experience / projects to jobs@paltech.eu

Drone-Based Terrain Mapping with SfM

Our goal is to map terrain accurately for autonomous robot navigation, using drones. This project focuses on enhancing map creation by employing Structure from Motion (SfM) for pixel-to-world transformations, correcting drone alignment errors. We aim to evaluate various Freeware SfM tools (e.g., MicMac, Colmap, OpenSfM) for optimal accuracy and efficiency.

Your profile:

- Knowledgeable in computer vision, image processing, photogrammetry and GIS.
- Experienced in Python.
- Interested in drone technology and geospatial analysis.

Your tasks:

- Review industry standards for terrain mapping and SfM.
- Compare SfM tools for accuracy and real-time capability.
- Implement SfM to improve terrain map accuracy from drone images.
- Capture terrain images for map reconstruction.

Your contact

Nhat Minh Hoang

Backend

minh.hoang@paltech.eu



Computer Vision: Exploring RGB-D and Multispectral Imaging

Our team is enhancing autonomous robotic systems using RGB-D and multispectral cameras. This internship invites you to develop solutions for detection, segmentation, and object identification tasks.

Your profile:

- Background in Computer Science, Robotics, or related fields with an emphasis on computer vision.
- Experience with Python and libraries like OpenCV and PyTorch.

Your tasks:

- Assess computer vision techniques for RGB-D and multispectral data.
- Implement and refine algorithms for detection, segmentation, and more.

Your contact

Felix Schiegg

Co-Founder

felix.schiegg@paltech.eu



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.

Your contact

Tomás Cruz

Navigation & Localization

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Web Development: Customer Portal

We're developing a web-based customer portal to enhance our service offerings. This platform will support various user roles (customers, service providers, and admins), enabling customers to register, obtain quotes, and facilitate optimized scheduling incorporating factors like weather data. Additionally, the portal will allow for invoice viewing and automated report generation.

Your profile:

- Studying or completed a degree in Computer Science, Web Development, or a related field.
- Experience with React and Django.
- Understanding of web development principles and interest in building user-centric platforms.

Your tasks can include:

- Contribute to the development of the customer portal using React for the frontend and Django for the backend.
- Implement features for user registration, role management, and quote generation.
- Integrate external data sources, such as weather information, to support optimized scheduling.
- Develop functionalities for invoice and report viewing and downloading.

Your contact

Nicole Caballero

User Interface

nicole.caballero@paltech.eu



Fighting Cyber Threats in Agriculture

In an era where autonomous functions are becoming integral to agricultural efficiency, understanding and mitigating cyber threats is crucial. This internship focuses on the analysis and implementation of security measures for autonomous driving functions in agriculture, particularly those involving positioning and GNSS sensor technologies. Following DIN 27005 and ISO 18497 standards, you will engage in a comprehensive process from researching sensor technologies to implementing and testing countermeasures in collaboration with IABG.

Your profile:

- Background in Cybersecurity, Information Technology, Robotics or related field.
- Interest in autonomous systems, GNSS, and cyber threat analysis.
- Analytical skills with an ability to conduct research and risk analysis

Your tasks:

- Research and assess threats to sensor technologies in autonomous agricultural functions, emphasizing positioning/GNSS.
- Conduct a comprehensive risk analysis based on typical agricultural use cases, identifying potential threats and evaluating their impact.
- Develop and implement countermeasures to enhance system security, testing these solutions in collaboration with IABG.

Your contact

Felix Schiegg

Co-Founder

felix.schiegg@paltech.eu



Simplifying Connections

We're on a mission to simplify the electrical framework of our robots, targeting the reduction of complex connections and the enhancement of maintenance procedures. Key to this project is the consideration of Electromagnetic Compatibility (EMC) and the utilization of KiCad for design optimization.

Your profile:

- Pursuing or completed a degree in Electrical Engineering or a related field.
- Solid understanding of EMC principles and proficiency with KiCad.
- Ability to interpret and apply information from datasheets effectively.
- Keen interest in robotics and strong problem-solving skills.

Your tasks:

- Analyze and re-engineer electrical connections for enhanced simplicity and reliability.
- Design and refine PCB layouts in KiCad, adhering to EMC standards.
- Collaborate with our engineering team to test and fine-tune designs based on real-world feedback.

Your contact

Felix Schiegg

Co-Founder

felix.schiegg@paltech.eu



Robotics Charging Systems Design

We are developing a charging station for our robots, capable of charging up to 8 LiFePO₄ batteries via grid or solar power, depending on availability. The project will utilize market-available components such as MultiPlus-II or MPPTs from Victron. The aim is to design a flexible and efficient charging solution.

Your profile:

- Background in Electrical Engineering or related field.
- Interest in renewable energy systems and battery technology.
- Experience with system design and component integration.

Your tasks:

- Conduct research on current technologies and components for solar and grid charging systems.
- Design the circuit layout for a scalable charging station using specified components.
- Implement and test the charging system, ensuring functionality and efficiency.

Your contact

Felix Schiegg

Co-Founder

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