

PhD Scholarships in Agricultural Robots and Software for
Sustainable Farming
University of Southern Denmark

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Job Title PhD Scholarships in Agricultural Robots and Software for Sustainable Farming
Department The Maersk Mc-Kinney Moller Institute
<https://roboticintercropping.eu/>
Institution University of Southern Denmark
Odense, , Denmark

Date Posted Oct. 27, 2025

Application Deadline Dec. 8, 2025

Position Start Date Feb. 1, 2026

Job Categories Graduate Student

Academic Field(s) Sustainable Engineering
Robotics
Computer Engineering
Computer Science
Agricultural

Job Website https://fa-eosd-saasfaprod1.fa.ocs.oraclecloud.com/hcmUI/CandidateExperience/en/sites/CX_1001/job/3271?l

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Job Description

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Imagine a world where food production is in harmony with natural processes, farmers nurture healthy soils, and biodiversity thrives. In contrast, current monoculture farming systems undermine this future. Can you see how Robotics and Digital Twins can open opportunities for autonomously operating agricultural robots? Are you passionate about making agriculture more sustainable? If you share our passion for technology and the difference it can make in meeting the UN's Sustainable Development Goals, perhaps you are one of our **three** new PhD students.

At the Maersk Mc-Kinney Moller Institute (MMMI), University of Southern Denmark in Odense, you will be part of the *Robotic Intercropping* (<https://roboticintercropping.eu>) team working to break new ground at the absolute forefront of what is possible in safe operation of autonomous agricultural vehicles. These are needed to enable better land use and management. This project promotes sustainable economic growth and higher levels of technological innovation. It will benefit society and create a safer and smarter world by providing decent work for all. Furthermore, autonomous robots will make current labor-intensive cultivation systems (e.g., strip-cropping, targeted mechanical weed control, etc.) profitable, contributing to increased biodiversity locally and reducing the need for insecticide use.

Responsibilities and qualifications

The PhD projects are funded by a grant from the Novo Nordisk Foundation for the project *Robotic Intercropping* (<https://roboticintercropping.eu>). The project involves four research partners from Denmark and the Netherlands. Thus, these PhD projects will be an integral part of a broader research team, consisting of collaborating partners with a common passion for autonomous agricultural robotics and new sustainable farming practices.

The PhD projects will combine lightweight agricultural robots, manipulators for managing crop competition, and digital twins for modeling the working environment. If selected, your main focus will be one of the topics below.

- **(PhD#1) Multi-Robot Systems (MRS).** Study and development of MRS based on swarm robotics to navigate fields with robotic implements using Digital Twin information. The MRS will include versatile, fast-moving tool-carrier robots, drones for aerial view and selected aerial manipulation, and specialized, slow-moving prototype robots.
- **(PhD#2) Robotic Implements.** Study and development of implements for managing main and support crops in the field, tested on stationary gantry robots and mobile platforms. Work includes lightweight, structurally optimized mechanical design, sensor/actuator integration, and implement control.
- **(PhD#3) Digital Twins (DT).** Development of a sophisticated DT as a dynamic representation of

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the field, modeling crop growth, canopy architecture, and competition for light, water, and nutrients. Integrate advanced sensors (e.g., spectral, LiDAR) and simulation tools to guide robotic actions for yield optimization and enhanced biodiversity.

Apart from the topics above, your own background, research interests and passion will be considered when defining your specific PhD project description.

Team and role

- You will be core members of a team developing lightweight, modular robots and digital twins for scalable, precise interventions in complex intercropping environments.
- Engage in interdisciplinary research integrating robotic systems and digital twins with multi-modal sensing and AI, aligned with agronomist-defined needs.
- Participate in integration and field testing with Robotic Intercropping partners.
- **For PhD#1 (MRS):** Embodiment and control of the MRS for precision operations; explore locomotion principles (including legs) and interaction with aerial robots (drones).
- **For PhD#2 (Implements):** Research, design, and build implement modules; generative design, dynamic simulation, additive/classical fabrication; sensorization, actuation, and integration on gantry/field robots.
- **For PhD#3 (DT):** Design software architecture; integrate multi-modal data and models (e.g., crop competition, farm-level); implement “what-if” simulation; develop robust interfaces (e.g., ROS) for planning, navigation, and precision actions.
- Collaborate with experts in plant science, robotics, statistics, and AI to bridge agroecology and robotic control.
- At MMMI you will be aligned with research units in Unmanned Aerial Systems (PhD#1), Industrial Robots (PhD#2), and Software Engineering (PhD#3). Expected outcomes include conference and journal publications, experimental validation, conference presentations, and teaching-assistant experience.

Appointment

Appointment as a PhD fellow is a 3-year salaried position, and the monthly gross salary incl. pension is 36.138 DKK. If you have relevant postgraduate experience, you may be placed on a higher salary step.

The positions are available from February 2026 or as soon as possible thereafter.

We expect

Degree. A two-year master's degree (120 ECTS) in Robotics, Electrical Engineering, Software

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Engineering, Computer Science, or an equivalent field (or a comparable degree at the same academic level).

Nice to have (role dependent):

- Specialization in agricultural/field/industrial robotics, mechatronics, embedded systems, or wireless communication (PhD#1 and #2); specialization in digital twins and software engineering of control systems (PhD#3).
- Experience with swarm robotic systems, manipulator design, cyber-physical systems, SIMULINK, and robotic software development.
- Knowledge of mechanical design, control system theory, statistics, actuation, sensing, rapid prototyping, and manufacturing.
- Experience with tools such as ROS, Gazebo/NVIDIA Isaac/Omniverse or CoppeliaSim for simulation, and data/cloud platforms.

Contact

For further information please contact:

- Professor Ulrik Pagh Schultz Lundquist ups@mmmi.sdu.dk
- Associate Professor Aljaz Kramberger alk@mmmi.sdu.dk
- Associate Professor Jan Corfixen Sørensen jcs@mmmi.sdu.dk

If you experience technical problems, please contact hcm-support@sdu.dk.

Application

Before applying the candidates are advised to read the [Faculty information for prospective PhD students](#) and the [SDU information on how to apply](#).

Assessment of the candidates is based on the application material, and an application must include:

- Motivated application.
- Curriculum Vitae.
- Master's and bachelor's degree certificates or equivalent, including transcripts of grades (copy of original/official English translation).
- Completed TEK PhD application form for 5+3 applicants. Find the form at the [Faculty website](#).
- Completed TEK PhD form for calculation grade point average. Find the form at the [Faculty website](#)

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- An official document describing the grading scheme of the awarding universities (if not Danish).
- Only for applicants from programmes that evaluate thesis/examination project by approved/not approved: An official written assessment of the thesis or dissertation project from the grade giving institution. The statement must clearly state that the candidate has been among the top 30 pct. in the graduation class for the study programme.
- List of publications and maximum 2 examples of relevant publications (in case you have any publications).
- References may be included, you're welcome to use the form for reference letter at the [Faculty website](#).
- A statement/documentation of other qualifications relevant to the position may also be included.

All documents must be in English and PDF format. CPR number (civil registration no.) must be crossed out. All PDF-files must be unlocked and allow binding and may not be password protected.

SUBMISSION GUIDE: Motivated application shall be uploaded in the box 'Cover letter' (max. 5 MB), Curriculum Vitae shall be uploaded in the box 'Resume' (max 5 MB). All other documents shall be uploaded in the box 'Miscellaneous documents' (max 10 files of max 50 MB per file).

The application deadline is December 8, 2025, at 11.59 PM / 23.59 (CET/CEST)

Assessment and selection process

Applications will be assessed by an assessment committee. Shortlisting may be applied, and only shortlisted candidates will receive a written assessment. [Read about shortlisting at SDU](#). Interviews and tests may be part of the overall evaluation.

Read about the [Assessment and selection process](#).

Conditions of enrollment/employment

Applicants must hold a master's degree (equivalent to a Danish master's degree) at the time of enrollment and employment. Employment is contingent on enrollment approved by the PhD School. Enrollment will be in accordance with [Faculty regulations and the Danish Ministerial Order on the PhD Programme at the Universities \(PhD order\)](#). Employment will be in accordance with the collective agreement between the Ministry of Finance and the Danish Confederation of Professional Associations for academics in the state with the associated circular on the job structure for academic staff at Danish universities and the provisions for PhD fellows as described herein as well as the Protocol on PhD fellows signed by the Danish Ministry of Finance and the Danish Confederation of Professional

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Associations (AC). [Further information about salary and conditions of employment.](#) The person employed in the position may, based on a specific individual managerial evaluation, be exempted from time registration, also known as a “self-organizer”.

The University of Southern Denmark wishes our staff to reflect the surrounding community and therefore encourages everyone, regardless of personal background, to apply for the position. SDU conducts research in critical technologies, which, due to the risk of unwanted knowledge transfer, are subject to a number of security measures. Therefore, based on information from open sources, background checks may be conducted on candidates for the position.

[Further information](#) for international applicants about entering and working in Denmark. You may also visit [WorkinDenmark](#) for additional information.

[Further information](#) about The Faculty of Engineering.

About Us

The University of Southern Denmark was established to create value for and with society. Whether our contributions come in the form of excellent research, innovative solutions, education or learning, we must make a positive difference to society and contribute to a sustainable future. We do this by cultivating talents and creating the best environments for research and learning. It is therefore crucial that SDU retains, develops and recruits talent. At the same time, we need to ensure consistently high quality in all our activities – and we can only do that with the right people. The University’s researchers, lecturers, students, managers and technical/administrative staff are the foundation of our success.

Contact Information

Please reference Academickeys in your cover letter when applying for or inquiring about this job announcement.

Contact Ulrik Pagh Schultz Lundquist
The Maersk Mc-Kinney Moller Institute
University of Southern Denmark
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