Exceptional
36-months Double Degree PhD Position
based on an employment contract

**PhD in Engineering and Technology Sciences (Computer Science)
and in Environmental Sciences**

Assessing soil and crop health across sugar-beet producing farms
Position I

EU Recruiting institutions		• **Poznan University of Technology, Faculty of Computing and Telecommunications, Poznań, Poland (18 Months)** • **University of Liège, Liège, Belgium (18 Months)**
Keywords		Data Integration, Data Engineering, Data Analytics, Data Science, ML & AI, Digital Agriculture, the Internet of Robotic Things, Data Stream Processing

Exceptional benefits at a glance

- **International PhD training excellence (here)**
- **Renowned supervisors & top-tier labs**
- **Interdisciplinary & multi sectoral research**

- **Full time 3-years employment**
- **Competitive MSCA salary & allowances**
- **Global academic & industrial network**
- **Non-academic secondments**

Salary	Living Allowance***	Mobility Allowance*	Family Allowance**
Gross amount per YEAR	**EUR 35656.92**	**EUR 8520**	**EUR 5940**

Long Term leave allowance (if applicable)

Special needs allowance (if applicable)

*private mobility-related costs (e.g. travel and accommodation costs), not their professional costs under the action

**doctoral candidate has or acquires family obligations during the action duration, i.e. persons linked to him/her by (1) marriage, or (2) a relationship with equivalent status to a marriage recognised by the legislation of the country or region where this relationship was formalised; or (iii) dependent children who are actually being maintained by the researcher, the family allowance must be paid to him/her as well

*** subject to health and social security insurance, pension rights, taxes, and other employment related costs

GreenFieldData Project at glance

This doctoral position is one of 14 double degree doctoral positions offered within the HORIZON Marie Sklodowska-Curie Action (MSCA) Joint Doctoral Network GreenFieldData: "IoRT Data management and analysis for Sustainable Agriculture". **GreenFieldData** will train a new generation of researchers able to tackle digital and green transition challenges using a human-centric approach to ensure the robustness and

relevance of the solutions responding to the specific needs of the EU market in a context of climate change and increasing socio-economic constraints. At a policy level, **GreenFieldData** outcomes will feed in directly to the aims of the HE Strategic Plan 2025-2027, EU Partnership Agriculture of Data and Digital EU Program. **GreenFieldData** proposes an interdisciplinary, inter-sectoral and international research project and training network on new IoRT (Internet of Robotic Things), based solutions for sustainable agriculture. **GreenFieldData** will mobilize 14 Doctoral Candidates (DCs) enrolled in Double Doctorate Diploma programmes with 12 academic main beneficiary partners, across 7 EU countries. Moreover, 21 non-academic associated partners, and 3 academic associated partners will provide support to the DCs. This ambitious project will provide the DCs with a unique toolbox of cutting-edge knowledge, tools, and strategies, which will boost their employability and benefit the next generation operational workforce (researchers, digital technologies, and agricultural stakeholders). The project will foster EU innovation by delivering human-centric IoT devices, robotics, and data-based solutions specifically designed for the European agricultural sector. These innovations will empower the sector to assess and mitigate the impacts of climate change, develop sustainable, low-input practices, and boost both its resilience and competitiveness.

PhD Project I – Assessing soil and crop health across sugar-beet producing farms

Context

This PhD project offers an exciting opportunity to advance sustainable agriculture by integrating plant–soil interaction measurements with cutting-edge data science. The successful candidate will work at the interface of precision agriculture, remote sensing, and soil health assessment, developing innovative open-source tools to merge farm-level inventories with high-resolution drone and satellite data as well as soil and plant characteristics. By combining this information with advanced crop modelling, the project will generate new insights into how agricultural practices influence soil health, degradation processes, and plant responses, thereby contributing to the sustainable transition of the sugar beet producing sector. The position is a collaboration between University of Liège (Gembloux Agro-Bio Tech) in Belgium and Poznan University in Poland, and includes secondments with industrial partners Raffinerie Tirlemontoise (Belgium) and ITTI (Poland).

Objectives

- Develop an open-source data management system allowing the integration of data coming from detailed farm inventory with high resolution remote sensing data (drones and satellite) as well as soil and plant characteristics
- Assess and correlate key soil health indicators (e.g. soil organic carbon) and associated degradation processes (e.g. erosion and fertility decline) as a function of agricultural practices
- Analyze plant response on degradation through crop-modelling within a precision agricultural and data fusion context

Work plan and task scheduling:

1. 1 – 12 Belgium:
   - month 1–3: learning the application domain
   - month 4–6: requirement analysis
   - month 7–9: collecting plant and soil data: remote sensing (drones and satellite) and soil sampling
   - month 10–12 - secondment: engagement in agro-inventory-database (sustainable farming-practices) at industrial partner RAFTIR; integration remote sensing derived plant and soil data with agro-inventory data
2. 13 – 24 Poland:
   - month 1–5: state of the art analysis in data integration and analysis for sustainable agriculture with the application to crop management; writing a report
   - month 5–9: building a data integration and storage architecture
   - month 10–12 - secondment: developing techniques for analyzing crop and robotic data
3. 25 – 30 Belgium:

- month 25–26: assessing soil health in relation to degradation processes (e.g., erosion and fertility decline) and as a function of agricultural practices
- month 27–29: developing a novel crop-model to assess real-time plant-soil interaction measurements
- month 30: output valorisation
4. 31 – 36 Poland:
   - month 31–33: finalizing the prototype system
   - month 34–36: testing and deploying the system in a production environment

Expected Results

- A data integration architecture based on a data lakehouse
- A novel open-source data management for agro-industrial stakeholders allowing to analyze multi-modal data (of different data types and structures)
- A user friendly recommender system to facilitate sustainable agricultural practices with the objective to enhance the delivery of multiple ecosystem services
- A next generation crop-model founded on real-time plant-soil interaction measurements from plot to landscape scales
- At least two journals (ranked in Scimago not lower than Q2)
- At least two international conference papers (ranked in CORE not lower than B)

References

- G. André, B. Bachelet, P. Battistoni, A. Belhassena, S. Bimonte, C. Cariou, F. Chabot, G. Chalhoub, A. Couvent, G. Garani, J. Laneurit, R. Moussa, K. Oikonomou, I. Sammour, M. Sebillo, M. Vilela Souza, N. Tricot, R. Wrembel: LambdAgrIoT: a new architecture for agricultural autonomous robots' scheduling: from design to experiments. Cluster Computing 26(5), 2023

- S. Bimonte, H. Badir, P. Battistoni, H. Bazza, A. Belhassena, C. Cariou, G. Chalhoub, J. Carlos Corrales, A. Couvent, J. Laneurit, R. Moussa, J. Eduardo Plazas, M. Sebillo, N. Tricot: Data-centric UML profile for agroecology applications: Agricultural autonomous robots monitoring case study. Computer Science and Information Systems 20(1), 2023

- L. Antonelli, H. Badir, H. Bazza, S. Bimonte, S. Rizzi: Requirements Engineering for Continuous Queries on IoRT Data: A Case Study in Agricultural Autonomous Robots Monitoring. Int. Conf. on Enterprise Information Systems, 2024

- C.G. Sørensen (eds): Smart Farms – Improving data-driven decision making in agriculture. Burleigh Dodds Series in Agricultural Science Number 147, 2024

- M. Vahdanjoo, G. G. Sørensen, M. Nørremark: Digital transformation of the agri-food system. Current Opinion in Food Science, vol. 63, 2025, https://doi.org/10.1016/j.cofs.2025.101287

- J.-P. Kasprzyk, R. Billen, S. Bimonte, L. d'Orazio, D. Sacharidis, P. Skrzypczyński, R. Wrembel: On Integrating Robotic Data with GIS Tools in a Cloud Environment. EDBT/ICDT Workshops, 2025

- S. Bimonte, G. Bellocchi, F. Pinet, et al: Technological and Research Challenges in Data Engineering for Sustainable Agriculture. BiDEDE@SIGMOD, 2024

PRACTICAL INFORMATION

Recruiting and host institutions	- **Recruting** by Poznan University of Technology, Poznań, Poland
	- **Hosts**
	  o Poznan University of Technology, Poznań, Poland (18 Months)
	  o University of Liege, Liège, Belgium (18 Months)

Doctoral schools	- Doctoral School @ Poznan University of Technology - Doctoral School @ University of Liege
Supervisors	- Prof. Robert Wrembel (Poznan University of Technology) https://www.cs.put.poznan.pl/rwrembel/

	● Prof. Jeroen Meersmans (University of Liège) https://www.uliege.be/cms/c_11402649/en/jeroen-meersmans
Non-academic mentors	● Dr. Rafał Renk (ITTI, Poznań, Poland) ● Sylvie Decaigny (RAFTIR, Belgium)
Secondments (1 to 6 hosting months)	● Raffinerie Tirlemontoise (RAFTIR, Belgium): 2 months m11-m12 ● ITTI (Poznań, Poland); 3 months m23-m24
Contact information	● robert.wrembel@put.poznan.pl ● jeroen.meersmans@uliege.be

RECRUITMENT CRITERIA

General criteria

To be eligible for this position, you must meet the following criteria at the time of recruitment:

Mobility and Education

- **MSCA Mobility Rule**: you must not have lived or conducted your main activity (work, studies) in Poland for more than 12 months in the 36 months immediately before your recruitment date
- **Doctoral Candidate Status**: you must not already hold a doctoral degree
- Educational Background:
    - o you must hold a **master degree in Computer Science**
    - o you must have earned the equivalent of 300 ECTS credits, with a major in Computer Science; a minimum of 60 of these ECTS must be from your master's degree
    - o your master degree must be from a university recognized by the International Association of Universities

Skills and Qualifications

- Scientific Excellence: your academic background and skills must be a strong fit for the specific PhD project
- Language Proficiency: you must be fluent in both written and spoken English, as it is the official language of the project
- Publication Record (Merit): while not mandatory, a record of scientific publications will be considered a significant advantage

Recommended knowledge, skills, and experience

- Database technologies (e.g., PostgreSQL), stream processing systems (e.g., Nebula Stream, Kafka, Flink), and programming languages (e.g., Python, Java)
- Data integration technologies (e.g., mediated architecture, data warehouse, data lake, data lakehouse, lambda)
- Sensor and robotic technologies
- Data analytics (especially on remote sensing data)
- Machne Learning and Artificial Intelligence
- Soil and plant sciences

HOW TO APPLY?

All information are provided [here](#)

Application deadline: 15 Apr, 2026

Additional information

Poznan University of Technology (PUT) educates about 16 000 students in over 30 study programs (undergraduate, graduate, postgraduate, and PhD), run by 9 faculties. The programs include among others: Computer Science, Electronics and Telecommunication, Automatic Control, Robotics, and Nanotechnology. Recently, PUT started the BSc program in Artificial Intelligence. PUT works in the field of education with approximately 160 European universities and in the research field - with 70 universities worldwide. PUT is a leader of the UNICE European University, which brings together 7 universities (in total 104 000 of students).

PUT is a co-owner of the Aviation Training Centre (aircrafts, gliders, drones, a professional flight simulator), a unique astronomical observatory, and the European Centre of Bioinformatics and Genomics. PUT cooperates very closely with Poznan Supercomputing and Networking Center, which specializes in HPC and provides their infrastructures for research. PUT has also an active cooperation with global and world-renowned companies, including among others: IBM, Meta, Intel, GlaxoSmithKline, Roche, Samsung, PKO BP (the biggest Polish bank), Santander, Kogeneracja Zachód (energy grids), and Volkswagen.

According to the US News Best Global Universities, PUT has been ranked within the top 4 technical universities in the country. Furthermore, in the 2019 Academic Ranking of World Universities (known as the Shanghai Ranking), PUT was ranked among 500 best universities in the world in two disciplines: computer science and mechanical engineering. The SCImago Institutions Ranking 2018 classified PUT as top three technical universities in Poland. In 2019, PUT was listed on QS World University Ranking. Since 2017, PUT is listed in U-Mulitrank. For years, PUT has been among top three the most frequently selected technical universities in Poland.

VISA requirements

Students from the EU countries can enter Poland with a valid travel document or another document confirming their identity and citizenship.

Students from countries outside the European Union (EU) and the European Economic Area (EEA) (which comprises the EU countries, Iceland, Liechtenstein, and Norway) can enter Poland on the basis of a valid travel document (passport) and visa (if required).

Welcome

PUT has a local section of Erasmus Student Network (ESN), which is a non-profit international student organization. Its main mission is to represent international students, thus provide opportunities for cultural understanding and self-development under the principle of Students Helping Students.

Accommodation

Accommodation in the PUT campus: PUT provides places in students dormitories, which are situated in a 5-10 minutes walking distance from the University. There are single and double rooms available with a private bathroom and kitchenette. All dormitories are heated and fully furnished. There is a laundry and a parking lot available as well.

Private accommodation can be searched at: http://erasmusu.com/en/erasmus-poznan/student-flat-rent

Getting to Poznań

Poznań is very well connected with European cities. The Poznań Ławica airport serves direct flights among others to London, Munich, Frankfurt, Copenhagen, Dublin, Amsterdam, Warsaw (the capital of Poland). The full list of connections is available at https://poznanairport.pl/en/homepage/

Poznań is very well connected also by train Berlin and Warsaw.

Why do a PhD at the University of Liège, Gembloux Agro-Bio Tech?

At the **University of Liège**, doing a PhD means working in a large public university that treats research as a core mission and backs it with clear values and strong support. ULiège highlights an open, respectful academic culture, grounded in academic freedom, pluralism, inclusion, wellbeing, and responsible research practices (https://www.uliege.be/cms/c_9247584/en/working-at-uliege). Doctoral candidates are considered early career researchers, encouraged to develop their careers through training, mobility, and professional growth opportunities inside an institution that is internationally engaged and closely connected to societal challenges.

GDPR information clause

In accordance with Art. 13 of the Regulation of the European Parliament and of the Council (EU) 2016/679 of 27 April 2016 on the protection of individuals with regard to the processing of personal data and on the free movement of such data and repealing Directive 95/46 /EC (hereinafter referred to as GDPR) we inform that:

- The administrator of your personal data is Poznan University of Technology located at ul. Jacka Rychlewskiego 61-131 Poznań, Poland e-mail: biuro.rektora@put.poznan.pl, phone: 61 665 3639
- Contact details of the Data Protection Inspector - Piotr Otomański, e-mail: iod@put.poznan.pl
- Your personal data will be processed in order to carry out the recruitment process; the legal basis for the processing of your personal data is voluntarily and knowingly expressed by your consent according to art. 6 section 1 (b) GDPR
- Personal data will not be passed on to processing entities (art. 28 section 1 GDPR). They can be only transferred only to bodies authorized by law
- Personal data will be kept for the period of the recruitment process or until you withdraw your prior consent, but its withdrawal does not affect the legality of the processing which was carried out on the basis of consent before its withdrawal
- You have the right to access your personal data, the right to rectify them, the right to transfer them, and if applicable, also to remove them, to limit processing and the right to object to processing
- You have the right to lodge a complaint with the President of the Office for Personal Data Protection when you feel that the processing of your personal data violates the provisions of the General Data Protection Regulation of 27 April 2016 (GDPR)
- Providing by you your personal data is voluntary, however, the consequence of not providing personal data may lead to inability to consider your candidacy for a vacancy
- Your data will not be processed in an automated way, including profiling