



POSTGRADUATE RESEARCH OPPORTUNITY

Project Title: Machine Learning-Based Decision-Support and Valorisation Tools for Sustainable Forestry Biomass Management

Short Project Description:

Technological University of the Shannon (TUS) invites applications from suitably qualified candidates for a **fully funded PhD position** under the **CBE-JU-funded ReTREEasure project** (Recovery of Tree Resources for Sustainable Use in Renewable Chemistry). The successful candidate will undertake cutting-edge research focused on the development of **an intelligent valorisation and decision-support tool for forestry biomass residues**. This interdisciplinary project will integrate ecological indicators, stand inventory data, UAV and satellite imagery, LiDAR, IoT-based environmental sensing, and machine learning to support sustainable forestry biomass management. The research will deliver a data-driven decision-support system capable of predicting the quantity, quality, and spatial distribution of extractable forestry residues under different harvesting scenarios, while ensuring compliance with site-specific ecological thresholds. In addition, the project will develop a valorisation dashboard to support sustainable forestry decision-making, biomass harvesting planning, and reforestation strategies.

About ReTREEasure:

ReTREEasure is a 4-year project funded by CBE-JU and aims to develop a forestry-specific ecological assessment framework to define sustainable residue removal threshold, deploy a modular, mobile on-site collection and preprocessing system with optimized local logistics strategies to reduce transport costs and emissions, and develop a machine learning-powered valorisation tool to guide forest owners in sustainable biomass harvesting and reforestation. ReTREEasure will pioneer integrated biorefinery approaches to convert residues into high-value products including PHB/PHBV biopolymers, bioleather, biopigments, bioactive compounds, lignin-based platform chemicals and epoxy, biobased and biodegradable packaging, cloth hangers, and substrates for mushroom cultivation.

Type of Degree Offered: PhD

Duration of Project: 48 Months

Stipend: €25,000 per annum

Fees: Fully funded

Funding Agency: Circular Bio-based Europe Joint Undertaking (CBE JU)

Minimum Qualifications/Experience Necessary/Any Other Requirements:

The candidates must have:

- A primary degree in a field related to Computer Science or a closely related discipline.
- A minimum classification of *2.1 honours or equivalent*.
- Strong motivation and enthusiasm for research

IELTS [International English Testing System] Applicants must have a minimum of 6.5 with no component score less than 6.5.

Project Lead Supervisor: Dr Yuansong Qiao

For further information, please contact: yuansong.qiao@tus.ie

Closing date for receipt of completed application form is **30 April 2026**. Application forms should be emailed to pro@tus.ie with the project title: Machine Learning-Based Decision-Support and Valorisation Tools for Sustainable Forestry Biomass Management in the subject line. Interviews will take place within subsequent weeks.



TUS

**Technological University of the Shannon
Midlands Midwest**

Ollscoil Teicneolaíochta na Sionainne:
Lár Tíre Iarthar Láir

**Download TUS Scholarship application
form here:**

<https://tus.ie/rdi/research/office/funded-research/>