**PhD Scholarship Advertisement**

Fully Funded PhD Scholarship in “Brazing Automation in Production-Design, Simulate, Build, Optimise & Test”, in Mechanical Engineering, College of Science and Engineering, University of Galway and I-Form.

Application(s) are invited from suitably qualified candidates for full-time funded PhD scholarship(s) starting in September 2025 in Mechanical Engineering at the University of Galway, affiliated with Research Centre I-Form ([www.i-form.ie](http://www.i-form.ie)) and Trane Technologies ([www.tranetechnologies.com](http://www.tranetechnologies.com))

**University of Galway**

Located in the vibrant cultural city of Galway in the west of Ireland, the University of Galway has a distinguished reputation for teaching and [research excellence](https://www.universityofgalway.ie/our-research/). For information on moving to Ireland please see [www.euraxess.ie](http://www.euraxess.ie)

**Overview**

The University of Galway, in partnership with Trane Technologies, invites applications for a full-time doctoral researcher/PhD student position focused on advancing automation in brazing and leak detection processes. This is a unique opportunity to work on an industry-led research project combining cutting-edge academic insight with real-world engineering application. The project will focus on developing innovative automation solutions using robotics, machine vision, and programmable logic controllers (PLCs), aiming to enhance manufacturing processes in HVAC systems.

**Detailed Project Description**

The goal of this project is to leverage modern brazing technologies and optimise processes to facilitate automation​ in a scalable, sustainable and productive way that can be deployed across the various production sites. This project is co-funded with industry partner Trane Technologies, a global leader in the HVAC&R industry (heating, ventilation, air conditioning and refrigeration) operating over 40 manufacturing sites across the globe, supporting a wide range of residential and commercial customers. Trane Technologies has introduced or initiated trials of automated propane flame brazing, hydrogen brazing and induction brazing in production. The purpose of the position is to develop a fundamental understanding of the material and process phenomena involved in automated induction and hydrogen brazing, leading to the industrial integration of optimised scalable brazing processes. This position is co-funded by Research Ireland (through I-Form) and Trane Technologies. The I-Form (www.i-form.ie) mission is to shape the future of advanced manufacturing through high-impact research into the application of digital technologies to materials processing. Our research spans materials science, engineering, materials modelling, data analytics and artificial intelligence to progress the understanding and implementation of advanced materials processing technologies. The successful candidate will work in the Advanced and Sustainable Manufacturing and Materials Engineering ([www.ASMME.ie](http://www.ASMME.ie)) research group under the supervision of Dr. Noel Harrison and Padraig Conneely.

**Key Responsibilities:**

* Design, develop, and validate robotic and automated systems for brazing operations
* Develop and integrate advanced leak detection methods using vision systems and sensors
* Collaborate with Trane Technologies' subject matter experts and automation engineers
* Build proof-of-concept prototypes and test beds to demonstrate system capabilities
* Conduct industrial trials and validate system performance in a production-representative environment
* Document technical findings and contribute to publications, patents, or technical reports
* Present project updates to stakeholders on a regular basis
* Development of computational models of induction and/or hydrogen brazing (e.g. COMSOL, ABAQUS)
* Development of robotic simulation of automated brazing processes
* Development and testing of laboratory robotic assisted brazing cell
* Experimental testing, including microscopy of brazed samples
* Optimisation of brazing processes
* Disseminate research output via journal publications, conference presentation
* Attend project meetings and events

**Desirable Skills**

* Familiarity with brazing processes and related thermal joining methods
* Experience with leak detection technologies (e.g., helium testing, pressure decay, acoustic sensing)
* Experience working in an industrial or industry-partnered R&D environment
* Experience with data acquisition, control system design, or SCADA integration
* Knowledge of safety standards for robotic systems and industrial automation

**What We Offer**

* A dynamic and applied research environment at the intersection of academia and industry
* Access to state-of-the-art laboratories, equipment and test facilities
* Mentorship and collaboration with leading automation experts from Trane Technologies
* Opportunity to make a direct impact on next-generation manufacturing systems

**Living allowance (Stipend):** [€25,000] per annum, [tax-exempt scholarship award]

**University fees**: [€5,890 EU rate including levy] are covered by the scholarship.

**Start date**: [1st October 2025]

**Academic Entry Requirements:**

• Minimum of 2.1 Honours Bachelor's or Master’s degree in engineering, materials science, computer science or closely related fields

* Excellent mathematical and advanced computational skills appropriate to the task (e.g. robotic programming and simulation, finite element analysis, custom programming)
* Excellent written and verbal English and overall communication skills
* Robotic system, brazing or welding experience
* Industrial experience in manufacturing, automation or assembly is highly desirable

**To Apply for the Scholarship:** (or to informally discuss the opportunity) please send an email to noel.harrison@universityofgalway.ie with the subject line “PhD Application 2025 - Brazing Automation in Production”

**Contact Name:** Dr Noel Harrison

**Contact Email:** noel.harrison@universityofgalway.ie

**Application Deadline:** [date 29/08/2025]and time [17:00] (Irish time 24hr format)

**Primary Supervisor name**: Noel Harrison