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# Post-Doctoral Researcher in Energy Harvesting in Industry 4.0

**BOF-77 Post-Doctoral Researcher in Energy Harvesting in Industry 4.0**

**Contract: Full Time/ Fixed Term**

## **Role Description**

The Wireless Sensor Network Group ([WSN](#)) at the Tyndall National Institute, University College Cork is currently advertising for the position of **Post-doctoral Researcher in Energy Harvesting in Industry 4.0**

The Tyndall National Institute is a world leader in the development of smart sensing and wireless systems. Working closely with a global range of academic, business and clinical partners, our technology is under evaluation by several multinational corporations and is approaching market readiness in a number of areas.

As part of the SFI Centre CONFIRM – Centre for Smart Manufacturing, the Wireless Sensor Network (WSN) group at Tyndall has secured funding in the development of Energy Harvesting systems for “Industry 4.0”. These systems will leverage our core strengths in Information and Communications Technologies to develop the next generation of breakthrough wireless sensing systems for use in a manufacturing environment.

## **Energy Harvesting for Industry 4.0**

The advent of the 4th industrial revolution brings forward some new challenges in manufacturing and automation. Industrial Internet of Things applications use data collected by physical things to minimise manufacturing mistakes and reduce the production cost. However, the “things” are usually deployed in inaccessible places imposing high maintenance cost regarding their battery replacement or costly long cabling. To this end, the project will focus on the development of a wireless power transfer mechanism, such as the RF-power emission from dedicated chargers, to replenish energy while guaranteeing the high reliability and robustness of an industrial network.

The successful Postdoctoral Researcher will focus on the design, implementation, and evaluation of an adaptive MAC protocol that will allow RF-power emission of dedicated chargers to power-up energy-constrained IoT devices taking into account potential interference with data transmissions.

The successful applicant will carry out his research project within this team which has expertise in Energy Harvesting, microsystems technology, wireless networks, electronics and low-power system hardware and software design.

Activities will include applied domain focused research into Energy Harvesting, Industry 4.0, deployment of electronic sensing systems, hardware/software co-design and integration of embedded systems incorporating data processing and machine/deep learning algorithms for Industry 4.0.

The candidate will be expected to write scientific publications associated with their work and travel to international conferences, workshops, industry meetings, proposal project meetings. This will help to strategically position Tyndall WSN as a world-leading industry-focused applied research group in

the area of smart system development for Human Computer Interfacing in an industrial context.

The successful Postdoc Researcher will help define, manage and implement an applied research project as part of a team of multi-disciplinary industry-aligned researchers with expertise in microsystems technology, wireless sensors, electronics and low-power system hardware and communications software design. The Researcher will help develop prototype and test the next generation Energy Harvesting Systems in conjunction with industry partners.

### **Key Responsibilities**

- To work under the direction of the Principal Investigator/Project Leader.
- To provide assistance in conducting relevant research activities, including planning, organising, conducting, and communicating research studies within the overall scope of the research project.
- To develop the specification, design and deployment of Energy Harvesting systems.
- To undertake tasks requiring technical competence in the field of Industry 4.0
- To coordinate and perform a variety of independent and team activities involved in the collection, analysis, documentation and interpretation of information/results.
- To undertake tasks which may include recording results and preparing reports including conclusions and recommendations. Application of qualitative and quantitative research techniques in Energy Harvesting systems.
- To engage in appropriate training and professional development opportunities as required by the Principal Investigator, School or College in order to develop research skills and competencies.
- To co-supervise postgraduate research students who are studying for a Masters or a PhD and have an agreed role in supporting these students in their day to day research.
- To carry out administrative work to support the program of research and ensure all project deliverables and milestones are achieved in a timely manner.
- To provide guidance as required to any support staff and/or research students assisting with the research project, as agreed with the Principal Investigator/Grant holder.
- To disseminate project outputs, through the interpretation of results and the preparation of manuscripts for publication.
- To work with industry/research partners (existing and planned) to identify their sensing needs (technologies and applications).
- Participate in Education and Public Engagement activities, as required.
- Ensure all activities are compliant with the Tyndall Quality Management system.
- Ensure all activities are compliant with the required Health and Safety standards.
- Carry out any additional duties as may reasonably be required within the general scope and level of the post.

### **Essential Criteria**

- A PhD in Engineering, Computer Science, Electrical and Electronic Engineering, or equivalent research experience.
- Appropriate research experience in Industry 4.0 systems and Energy Harvesting.
- Experience with sensor development, Energy Harvesting systems integration and test
- Experience with lab-equipment.
- A strong publication record.
- An ability to work independently to a schedule.
- A demonstrated capability in the delivery of research projects at undergraduate or postgraduate level.
- Capability of working effectively within a team to achieve results.
- Excellent verbal and written communication skills

- High levels of initiative, project management, self-management, achievement-orientation, and motivation are encouraged.

### **Desirable Criteria**

- Good analytical skills and computer skills.
- Evidence of excellent organizational and communication skills.
- Evidence of excellent time management skills.
- Experience with sensor systems for manufacturing is an asset.
- High levels of initiative, self-management, achievement-orientation, and motivation are encouraged.

### **CONFIRM- Science Foundation Irelands Centre of Smart Manufacturing**

CONFIRM's vision is to transform and grow Irish manufacturing by integrating intelligence within products, machines, production systems and supply chains. Smart Manufacturing has been defined as "the intelligent, realtime orchestration and optimisation of physical (people & equipment), digital and business processes within factories and across the entire value chain". This systems-level approach differentiates CONFIRM from other manufacturing initiatives, many of which focus on disparate challenges such as 3D printing, advanced materials, continuous processing, autonomous vehicles, etc. While these are important topics for discrete industry sectors and product portfolios, we believe that adopting a systems-level approach offers the greatest potential for significant advances and impact across multiple manufacturing sectors.

This is a fulltime Post-doctoral Researcher opportunity in University College Cork, with the successful candidate on approved IUA salary Scales for postdoctoral Researchers, initially for 24 months with the possibility of extension beyond that.

Informal enquiries can be made in confidence to Brendan O'Flynn at [brendan.oflynn@tyndall.ie](mailto:brendan.oflynn@tyndall.ie)

Appointment may be made on the Post-doctoral Researcher Scale €37,221 - €44,266 depending on qualification and experience.

### **Application Instructions**

**Step 1 - click [here](#) to download and complete the Application form and indicate BOF-77 as the Job Reference**

**Step 2 – return completed Application form, together with your CV and motivation letter to [careers@tyndall.ie](mailto:careers@tyndall.ie).**

Handwritten forms will not be accepted.

Please note that Garda vetting and/or an international police clearance check may form part of the selection process.

The University, at its discretion, may undertake to make an additional appointment(s) from this competition following the conclusion of the process.

Please note that an appointment to posts advertised will be dependent on University approval, together with the terms of the employment control framework for the higher education sector.

At this time, Tyndall National Institute does not require the assistance of recruitment agencies.