

Opening for PhD position – Development of micro-ring resonators as optical sensors for structural health monitoring based on guided waves (MRR4SHM).

In the frame of OPUS project (2024/55/B/ST8/00272) entitled: “Development of micro-ring resonators as optical sensors for structural health monitoring based on guided waves (MRR4SHM).” funded by the National Science Centre, Poland at *Institute of Fluid-Flow Machinery, Polish Academy of Sciences, Gdańsk, Poland*

About the project

We are looking for a talented person holding Masters title, who is interested in continuing his scientific work and possibly embarking on a study towards a PhD.

The project provides employment for one scholarship holder in a multidisciplinary project borrowing concepts from structural engineering and optics. The research will be realised at the Department of Mechanics of Intelligent Structures.

The aim of research will be a detailed investigation of the use of novel optical fibre sensors based on the micro-ring resonator (MRR) guided waves based structural health monitoring (SHM). The study will focus on investigating the different factors affecting the measurement sensitivity of the MRR including, the physics of the wave coupling, the deployment on the structure and the orientation. The work will have an analytical, numerical and experimental scope and will involve closely working with experts from the field of optics.

In the frame of the project, the physics corresponding to the fiber-wave coupling will be studied, understood and modelled. Different aspects of the sensor-structure interaction including bond type, bond length, sample materials etc. will be studied. Once the phenomenon is understood, the phenomenon will be used for damage detection in structures. The problem of optimization of sensor placement will be investigated as well.

The offer

We offer a PhD position

- in the Department of Mechanics of Intelligent Structures, IMP PAN Gdańsk, Poland (<http://www.imp.gda.pl/en/o4/z1/>).

A full time position funded with a PhD scholarship is offered for 36 months and the payment is inline with the funding body regulations meaning: 5000 PLN (before deductions) and after successfully clearing the mid-term evaluations , 6500 PLN (before deductions).

In addition to the stipend, the stipend holder will be eligible for performance based bonuses (linked with publications of results in high impact factor journals).

The researcher is expected to join on **1st October 2025**

Eligibility criteria

1. Masters in mechanical engineering, material science, physics or related fields.
2. High average grade obtained during studies.

3. Good knowledge of written and spoken English.
4. High motivation for scientific work and a strong commitment to research work.
5. Willingness to travel within Poland and abroad for joint experiments, trainings and conferences

Tasks

1. Numerical research related to methods for modelling of propagation of elastic wave in solids.
2. Experimental investigation of the damage sensitive features captured by the MRR
3. Development of algorithms for damage detection in Matlab/Python
4. Development of algorithms for interfacing and synchronizing between the apparatus
5. Signal processing and results analysis.
6. Preparation of reports based on results analysis.
7. Preparation of journal and conference publications.
8. Presentation of results at scientific conferences related to research topics.
9. Communication and discussion of results within the research team.
10. Communication of results to general public through participation in outreach activities

Skills/Qualifications

1. Masters in mechanical engineering, material science, physics or related fields.
2. High average grade obtained during studies.
3. Good knowledge of written and spoken English.
4. High motivation for scientific work and a strong commitment to research work.

Specific Requirements

We especially seek candidates who:

- possess knowledge about numerical methods and modelling in FE modelling software,
- have programming skills,
- are able to write code in Matlab language.
- mobility and flexibility for attending conference and research stays abroad.

In addition, the following will be assessed:

- the candidates' scientific track record (publications, conferences, projects, scholarships, etc.),

- the prizes and distinctions of the candidate resulting from the research carried out.

Selection procedure

Selection process is in accordance to National Science Centre regulations.

1. Submission of applications is possible through **31st August, 2025**.
2. The results of the recruitment will be published by **15th of September 2025**
3. The candidate is expected to join latest by **1st October 2025**.
4. Form of applications: Applications in English can be sent by e-mail to rsoman@imp.gda.pl with a subject "PhD student in Opus project application attn.: Rohan Soman".
5. Candidates interested in applying for the positions should submit the following documents:
 - Cover letter
 - CV / scientific resume
 - copy of the certificate of Master degree
 - the list of scientific achievements (publications, participation in research projects, participation in conferences, awards, scientific stays, etc.)
 - optional: letter(s) of recommendation obtained from people (e.g. supervisors, former managers) directly cooperating with the candidate.
6. The application must contain information about the educational background and work experience.
7. Please, attach the requested documents in the PDF format.
8. During the recruitment process the selected candidates may be invited for an interview (in person or via internet).
9. The result of the recruitment procedure will be sent to the candidates via email.
10. Please include in the application the following statement:

"I hereby authorize to process my personal data included in my application for the needs of the recruitment process (in accordance with the Act of 08.20.1997 r. on personal data protection - Dz. U. No 133, item 883) ".

If needed, selected Candidates may be invited for an interview (in person or via videoconference on Internet).

Additional questions could be sent by email to Rohan Soman: rsoman@imp.gda.pl