

## FORM FOR EMPLOYERS

**INSTITUTION:** AGH University of Krakow

**DEPARTMENT:** Department of Robotics and Mechatronics

**CITY:** Krakow, Poland

**POSITION:** adjunct postdoctoral researcher in group of scientific staff (part-time job)

**DISCIPLINE:** mechanical engineering

**EXPIRES:** November 22<sup>nd</sup> 2023

**WEBSITE:** <https://www.genex-project.eu>; <https://www.agh.edu.pl/o-agh/praca-w-agh>

**KEY WORDS:** numerical modelling, finite element method, piezoelectric materials, structural dynamics

### **DESCRIPTION (field, expectations, comments, requirements):**

The researcher involved in the Project will take part in theoretical – analytical and numerical – and experimental works related to the design of piezoelectric sensors, analysis of their arrangement and optimization for obtaining best detection capabilities of the system. The particular sensors developed and used in the Project will be interdigital transducers (IDT). These have very important features in terms of their application to SHM, including small size and mass with negligible effect on the investigated structure as well as conformity to the investigated structure, especially to curved surfaces. The use of macro fiber piezocomposite (MFC) enables mode selectivity for the excitation of the most suitable for damage detection wave modes as well as directivity pattern providing sensitivity to certain regions of interest (hot spots), and a relatively low price. The researcher will work on the design of sparse arrays of the IDT sensors, and the design and application of tailored topologies by means of advanced optimization algorithms. He/she will use hybrid topological optimization schemes (based on a combination of genetic and deterministic methods) for the transducer design and for determining optimal sensor placement for a specific application. The IDT will be provided in tuning mode enabling their adaptation to specific structure and material conditions. Behavior of the digitally optimized prototype IDTs will be experimentally evaluated in parent composite structures using advanced laser vibrometer systems.

### **QUALIFICATIONS and REQUIREMENTS:**

- 1) PhD thesis in the field of mechanical engineering,
- 2) knowledge of the following topics: elasticity theory, transient dynamics (elastic waves), dissipation theory, structural optimization,
- 3) documented experience in building models and conducting numerical analyses,
- 4) documented knowledge of signal processing techniques (frequency analysis, filtration),
- 5) English (fluent in speech and writing - at least B-2 level),
- 6) knowledge of the theory of the finite element method and computational packages using FEM, knowledge of the scientific computing environment (e.g. Matlab or similar),
- 7) 1-4 years of research experience,
- 8) list of scientific and organizational achievements and participation in conferences and symposia,
- 9) good communication skills,
- 10) enthusiasm for work (also in a team),
- 11) willingness to learn and improve qualifications.

This position is funded within an EU-funded GENEX project (<https://www.genex-project.eu>).

### **DOCUMENTS REQUIRED:**

Cover letter, CV, questionnaire, certificate of English language (B-2 minimum), and the list of scientific and organizational achievements and participation in conferences and symposia, and participation in national and international projects.

### **DOCUMENTS MUST BE SUBMITTED AT:**

Please submit documents in electronic form – to Lukasz Ambrozinski, DSc, PhD ([lukasz.ambrozinski@agh.edu.pl](mailto:lukasz.ambrozinski@agh.edu.pl)) by November 22<sup>nd</sup>2023, 23:59

The AGH University will be not the candidate's main place of employment.

*The AGH University of Krakow does not require you to provide any information or data other than those resulting from the applicable law (name/names, surname, date of birth, contact details, education, professional qualifications and employment history). However, if you choose to include your photograph or any other information, please fill in and attach this statement of consent to the processing of personal data, which constitutes an attachment to this information.*

*The controller of your personal data processed in order to carry out the recruitment process for the above-mentioned position is AGH University of Krakow, al. A. Mickiewicza 30, 30-059 Krakow. You can read the full information concerning the processing of your personal data on the AGH University of Krakow's website after going to the "Protection of personal data" tab at ([www.agh.edu.pl/ochrona-danych-osobowych](http://www.agh.edu.pl/ochrona-danych-osobowych)).*

*The University reserves the right not to settle the competition without providing any reason or justification. Winning the competition is not tantamount to ensuring the candidate's employment. The result of the competition serves solely as a recommendation to the Rector in this regard. The final decision concerning the employment will be made by the Rector.*

Cracow, on .....

.....  
*name and surname*

**CONSENT TO PERSONAL DATA PROCESSING**  
(recruitment - employee)

Pursuant to Article 6(1)(a) of the Regulation (EU) 2016/679 of the European Parliament and of the Council of April 27, 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data and repealing Directive 95/46/EC (General Data Protection Regulation), [OJ EU. L. 2016.119.1, May 4, 2016] hereinafter referred to as "GDPR", **I consent to the processing of my personal data other** than the data mentioned in Article 22<sup>1</sup> § 1 of the Labour Code and contained in my CV and other application documents, and to the reproduction of my physical likeness **for the purposes of recruitment and selection for the position of** ..... (contest notice no. ....).

In addition, I declare that the request for consent has been presented in a clear and understandable manner and that I have been informed about a possibility of withdrawing my consent at any time as well as about consent accountability. The withdrawal of consent to have personal data processed shall not affect the legality of the processing, which is carried out on the basis of such consent prior to its withdrawal; The consent may be withdrawn by submitting a written representation on consent withdrawal at a place that was indicated in the contest notice as the place for submitting documents.

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Date and signature