



VACANCY NOTICE – 2023-IPR-S4001-FGIV-022704

FG IV Scientist - Exploratory Research Project

Innovative Renovation of Building Skins with Robots (RoBUILT)

Type of contract	Member of the European Commission's contract staff, Function Group IV (article 3b of the Conditions of Employment of Other Servants)
Duration of contract	36 months employment contract for the Exploratory Research Project Innovative Renovation of Building Skins with Robots (RoBUILT). Employment contracts for this category of staff can be renewed up to maximum 6 years.
Area	Technologies and Engineering in Science and Industry
Place of employment	Ispra (IT)
Indicative basic salary	3877,47 - 5616,29 € (applicable as of 1 st of July 2022) For more detailed information please consult: Working Conditions

WE ARE

The [Joint Research Centre \(JRC\)](#) provides independent, evidence-based knowledge and science, supporting EU policies to positively impact society.

The current vacancy is in the Safety and Security of Buildings Unit of the Directorate for Space, Security and Migration of the JRC. The Directorate's mission is to focus on emergency preparedness, response, disaster risk management and resilience in cases of natural and man-made hazards.

The operational scientific research will take place in the unit with a team of experimentalists and numerical modellers who provide reference results relevant to the European standardisation in the building and construction sectors. Further information is available at: [European Laboratory for Structural Assessment: Reaction Wall facility \(europa.eu\)](#)

The Scientific Development Programmes Unit is in charge of the overall JRC Exploratory Research Programme.

The vacancy is within the **Exploratory Research Project Innovative Renovation of Building Skins with Robots (RoBUILT)**. The JRC Exploratory Research Programme is a strategic initiative characterised by ideas that might lead to novel results and qualitatively enrich current JRC scientific work.

The past three decades have seen advancements in robotics and automated systems in the construction industry; however, most have been developed for off-site prefabrication or the construction of new buildings. At the same time, renovating the European buildings, which are responsible for 36% of the global CO₂ emissions and 40% of the overall energy consumption, is crucial to support EU path towards net-zero carbon targets. Along with



environmental and structural benefits, upgrading and extending the lifetime of the existing buildings is more cost-effective than demolishing and reconstructing new ones. Meanwhile, the construction industry in Europe is confronted with a massive shortage of workforce and skills, hindering progress in achieving higher building renovation rates.

The **Exploratory Project RoBUILT** aims at developing novel robotic and automated systems to renovate the envelopes of the existing EU buildings. In particular, these novel renovation solutions will be adopted to implement envelope-retrofitting strategies, which currently are done solely by workers encompassing huge labour and safety risks and requiring the installation of scaffoldings, which are time-consuming, expensive, and intrusive. The effectiveness of the proposed concepts will be validated experimentally on both small and large-scale prototype specimens.

We offer:

An excellent opportunity to carry out scientific and technical tasks in accordance with the Exploratory Research Project Innovative Renovation of Building Skins with Robots (RoBUILT) with particular emphasis on:

- Exploring the use of robotics and automated systems to retrofit existing buildings' envelopes;
- Supporting the 'renovation wave', an initiative of the European Green Deal, to boost renovation the existing EU building stock; and also addressing the impact of digital transformation in the building sector, in line with the Europe's Digital Decade bunch of policies.

WE PROPOSE

The successful candidate will

- Carry out a comprehensive review of the existing robotic and automated systems applied to on-site construction, focusing on solutions compatible with interventions for renovating the buildings' skin with particular attention to combined energy plus seismic retrofitting;
- Design such an automated system to apply the retrofitting, considering that the system should perform multiple and accurate tasks (e.g. manipulate objects, apply mortar/plaster, drill) for interventions in buildings' façades;
- Set-up of experimental mock-ups at both small- and full-scale, i.e. construction of wallets, application of the retrofitting with the robotic system;
- Perform structural tests on both small- and full-scale mock-ups;
- Define a methodology for the use of robotic systems in retrofitting buildings' envelopes, supported by an economic viability assessment;
- Experimental results treatment;
- Project management;
- Provide regular and accurate reports on scientific activities every twelve months and a final report;
- Report to the Project Leader on progress, achievements and potential problems in a timely manner;
- Provide feedback and maintain interactive communication with colleagues;
- Explain the research activities and achievements to third parties, such as scientific communities and the general public;
- Write, publish and present scientific reports, articles and conference papers.



WE LOOK FOR

A scientist with the following essential qualifications:

- A doctoral diploma in civil/structural engineering, architecture or field relevant to the position; alternatively completed university studies of at least three years attested by a diploma and at least five years professional experience in a field relevant to the position;
- Previous research or professional experience relevant to the topic of the call (i.e. retrofitting of existing structures; masonry buildings; digital fabrication);
- Good oral and written communication skills in English (B2).

In addition, the following competences will be considered as an advantage:

- Previous research or professional experience on integrated solutions for the seismic and energy retrofitting of existing buildings, including masonry and cultural heritage structures;
- Solid record of research activities, including publications relevant for the post in international peer-reviewed journals;
- Ability to work in a team and in a multi-cultural environment.

The candidate is expected to be creative and work independently

HOW TO APPLY

If you are **already on a valid CAST FG IV reserve list**, or you **have already applied to one of the calls below**, you can directly submit your application at <http://recruitment.jrc.ec.europa.eu/?type=AX>.

Interested candidates should provide a CV and cover letter explaining their motivation and aptitude for the vacancy and the described research areas and tasks. In the list of publications accompanying the CV, please highlight your five most relevant publications.

If not, before applying to this position, **you must register** for one of the two following:

- the [Call for Expressions of Interest | EU Careers \(europa.eu\)](#) (CAST Permanent FG IV), which is used by a wide range of organisations (institutions, bodies, offices and agencies of the European Union), or
- the [specialised call for researchers](#) (JRC Call COM/1/2015/GFIV – Research), which is mainly used by the JRC.

Note that each of the calls above has **different minimum eligibility requirements and different selection tests**.

The JRC cultivates a workplace based on respect for other people and the environment, and embraces non-discriminatory practices and equality of opportunity. In case of equal merit, preference will be given to the gender in minority.