VACANCY NOTICE – 2023-IPR-T2-FGIV-022531

Project Officer - Applied Quantum Computing for Internal Security Researcher

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 (renewable up to maximum 6 years)
Area	*Quantum Computing for Internal Security*
Place of employment	Ispra (IT)
Indicative basic salary	3877,47 - 5616,29 € per month 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 with the Cybersecurity and Digital Technologies Unit of the Digital Transformation and Data Directorate, located in Ispra, Italy. The Unit works on risk mitigation, cybersecurity, cybercrime, digital forensics, and innovative digital technology solutions for security, privacy and safety, and on the associated legal and regulatory frameworks, to strengthen the trust of the European citizen in a secure and fair digital European society.

The successful candidate will contribute to the Digital Forensic Investigation Techniques for Law Enforcement project, which addresses all key elements (i.e., identification, localisation and crime characterisation functionalities) required to strengthen the efficiency of criminal investigations and prosecutions in the digital era.

The project provides support to several European Commission policy initiatives and the implementation of the European Security Union policy.

We offer:

- a job in a dynamic, multidisciplinary working environment, with online collaboration and occasional travel for conferences/workshops.
- a unique opportunity to work behind the scenes contributing to the fight against crime and terrorism at European level.
- family-friendly working conditions, located in a beautiful area of Italy with good international access.

WE PROPOSE

The jobholder will contribute to research activities exploring the prospects and impact of applied quantum computing for EU Internal Security and law enforcement activities, new approaches in forensics, in the area of quantum computing applied to the fight against cyber-dependent crimes, and carrying out the following tasks:

- Study the landscape and capabilities of current quantum devices and contribute to the understanding of the likely impact of this developing field on EU Internal Security.
- Conduct explorative research on quantum machine learning for forensics on real, noisy quantum systems, addressing the challenge of encryption in criminal investigations.
- Study and develop prototype algorithms in applied quantum computing and in quantum machine learning using simulation tools or real quantum systems. The focus will be on understanding and preparing for the potential impact of fully operational quantum computers in forensics and law enforcement practices.
- Contribute to proof-of-concepts and prototype developments in related fields, such as encryption, post-quantum cryptography, quantum machine learning and quantum acceleration of artificial intelligence and data analysis.
- Prepare scientific papers and technical reports.

WE LOOK FOR

We are looking for a Applied Quantum Computing for Internal Security Researcher. The successful candidate shall have a PhD degree - or a minimum of 5 years of full-time work experience after the first University degree giving access to doctoral (PhD) studies in the field of: applied mathematics, cryptography, computer science, quantum computing, information engineering, machine learning and deep learning techniques, or similar.

The following qualifications also are required:

- Expertise in quantum computing.
- Knowledge of quantum programming languages and frameworks such as Qiskit, Cirq, Forest, Silq, Penny Lane or Q#, at least in simulation.
- Ability to work in a multi-national team.
- Relevant publications in peer-reviewed conferences and journals.
- Good level (B2) of spoken and written English.

The following qualifications are an asset:

- Experience in machine learning and deep learning techniques, ideally with a focus on quantum computing applications
- Experience in applied mathematics, specifically in cryptography
- Experience in quantum assembly languages such as QASM, and programming of real quantum computing hardware.
- Experience in quantum annealing approaches and related software such as Ocean
- Experience in multimedia forensics and analysis
- Experience in at least one of the following programming languages: C/C++/C#, Python, MATLAB.

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.

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.