

Institute of Engineering and Management of Grenoble Alpes University





Grenoble INP - UGA is a member of international engineering and management education and research networks. It is widely recognized in national and international rankings.



8 schools + 39 laboratories

**8300** students

**1 300** teaching, research, administrative and technical staff

Grenoble INP - UGA is a renowned public institution of higher education and research, and a major player in the Grenoble ecosystem. It is the engineering and management institute of Grenoble Alpes University, and plays a leading role in the scientific and industrial community.

# **Researcher in computer science**

Job reference number	2024-RESCOMPUTSCIENCE-LIG
Research field	Digital Electronics (Embedded systems design, digital architecture design in disruptive technologies)
Host laboratory	LIG (UMR5217) / Website <u>https://www.liglab.fr/en</u>
Requested profile	Recognized researcher (R2) /
Location	Grenoble, France
Date of recruitment / contract term	01/10/2024 (10 months)
Contacts	alain.tchana@grenoble-inp.fr

Grenoble INP - UGA is a leading public institution accredited with the French label "Initiative d'excellence". It offers innovative engineering and management programs, with an increasing internationalization of its course offers. The courses are grounded in sound scientific knowledge and linked to digital, industrial, organizational, environmental and energy transitions. The Engineering and Management Institute of Grenoble Alpes brings together more than 1300 staff members (teacher-researchers, lecturers, administrative and technical staff) and 8300 students, located on 8 sites (Grenoble INP - Ense3, Grenoble INP - Ensimag, Grenoble INP - Esisar, Grenoble INP - Génie industriel GI, Grenoble INP - Pagora, Grenoble INP - Phelma, Polytech Grenoble, Grenoble IAE and the INP Prepa). Grenoble INP is also a highly-ranked institution of higher education and research, leading the way in the fields of engineering and management on an international scale. It is a member of a large number of international academic and research networks. It is part of the European University UNITE!.

As part of Grenoble Alpes University, Grenoble INP has associated guardianship of 39 national and international research laboratories and of technological platforms. The research conducted there benefits both its socioeconomic partners and its students. Grenoble INP is at the heart of the following scientific fields: physics, energy, mechanics and materials; digital; micronanoelectronics, embedded systems; industry of the future, production systems, environment; management and business sciences.

Grenoble INP - UGA is an equal opportunity employer committed to sustainability. Grenoble INP-UGA celebrates diversity and equity and is committed to creating an inclusive environment for all employees. All qualified applications will be considered without discrimination of any kind.

## Research

### Description of the laboratory and its immediate research environment (team):

The LIG laboratory is essential in the field of computer science research, at both the local, national, and international levels. It boasts nearly 450 researchers, faculty members, doctoral students, and research support staff. The ambition of LIG is to contribute to the development of fundamental aspects of computer science (models, languages, methods, algorithms) and to foster synergy between the conceptual, technological, and societal challenges associated with this discipline.

LIG is organized around five thematic research axes, including Distributed Systems, Parallel Computing, and Networks, which comprise five teams. The thesis work will take place within the ERODS project of LIG (erods.imag.fr), under the supervision of Alain TCHANA. The team conducts research on the construction and administration of operating systems and distributed systems. It is particularly interested in virtualization mechanisms, as well as the autonomy and robustness of systems.

### Offer description :

Process and Thread are first-order abstractions of the operating system (OS), whose implementation is wired into the OS core. Several research works have shown the inadequacy of these two main abstractions for modern isolation needs, leading to the introduction of additional abstractions with new isolation and communication features. Despite their usefulness, these new proposals are introduced in a somewhat ad-hoc manner, compromising their broad and consensual adoption. This offer is about the design of xOS, an OS design that does not introduce yet another first-class isolation abstraction but instead investigates how the OS can help application programmers, libraries, and OS developers integrate and easily use new abstractions. Similar to file system development built around a Virtual File System (VFS), xOS introduces the concept of Isolation Context (IC), which should be the unique first-class abstraction wired into the OS core. ICs can be realized in several pluggable Isolation Context Factories (ICFs) such as ProcessFactory (provides processes), Thread-Factory (provides threads), Docker Engine (provides Docker containers), KVM (provides KVM virtual machines), Wasp (provides virtines), etc. The recruited postdoc will design a general-purpose OS from these foundations, the required APIs, and the support for new and legacy applications.

## Specific requirements or conditions

The ability to work in both French and English is essential. Additionally, international experience will be an added advantage.

## Specifics of the position

The research may be led on 2 locations: Grenoble and St Martin-d'Hères.

#### Position assigned to a restricted area: YES

(Device for the protection of the scientific and technical potential of the nation, conditioning the appointment of the researcher to the authorization of the Defense Security Officer).

## How to apply

Applications must be sent to : <u>alain.tchana@grenoble-inp.fr</u>

Application deadline : 02/07/2024