RECRUITMENT OF PROFESSORS
2021 SESSION

Grenoble INP, Engineering Institute of the Univ. Grenoble Alpes, labeled Initiative of Excellence, is a public institution offering engineering courses with solid basic scientific content, a high technological specialization in connection with strong societal challenges related to digital, industrial, environmental and energy transitions. and a major internationalization of its courses. Grenoble INP employs more than 1,200 people (associate and full professors, lecturers, administrative and technical staff) and has 5,500 students in its 6 engineering schools (Ense3, Ensimag, Esisar, GI, Pagora, Phelma) and the Prépa des INP. From 2020, Polytech Grenoble and Grenoble IAE join Grenoble INP and considerably expand its training offer. Grenoble INP is recognized in national rankings as one of the leaders in engineering with international visibility. It is member of international engineering networks as well as the European university UNITE!.

Grenoble INP is a mother institution of more than 30 research laboratories, some of them international, and platforms where state-of-the-art research is carried out to develop knowledge, promote it to our industrial partners and transfer it to students. Grenoble INP is thus at the heart of the technological challenges of the future: Energy and materials; Digital sciences; Micro nanotechnology; Future industry and eco-efficient production in which international rankings recognize it as a leading player.

POSITION DESCRIPTION

Short profile: Quantum Computing, Computational models of the future

Category: **Professor**

Job number: **27 PR 0556**

Field of expertise: **CNU27 (computer science and engineering)**

Recruitment date: **2021/9/1**

Location : **Grenoble**

Restricted regime area (ZRR): ~~YES~~   NO
(French governmental protection of scientific and technological research program)

Key words: computational models, quantum computing, formal methods, model hybridization

TEACHING

Ensimag is one of the best French Engineering schools in the digital field. It delivers conceptual and technological teaching of very high level in the disciplines of computer science and applied mathematics. It prepares students for careers in digital engineering in many sectors such as information systems, banking, embedded systems, networks, and all industries for design and decision support tools.

Teaching profile:

Ensimag, the reference school for digital technology, is recruiting a computer science professor with the motivation and ability to create and take responsibility for training courses from the 1st to 3rd year of engineering, as well as for Master's courses. In particular, the recruited person will have to take responsibility for computer science modules in the Ensimag common core courses, which make up the whole of the 1st year and about 50% of the courses in the 2nd year.

With this recruitment, Ensimag wants to develop its courses in quantum computing and future computational models. Quantum computing has been introduced at the school for more than 15 years through specialized courses, notably in the Master's program in Cybersecurity.
The objective is to initiate students more widely to quantum computing by introducing it in modules that present computational models, notions of computability and complexity, and formal methods. It also aims to enable students to develop their skills using project-based teaching methods, with the help of the school's partner companies and laboratories, which provide the school with quantum technologies (machines or emulators). As engineering school, Grenoble INP-Ensimag has important relationships with companies for training, innovation and development.
This recruitment takes place in a dynamic and interdisciplinary context of research, innovation and training in quantum engineering through the Quantum Engineering site project.
The person recruited will also represent Ensimag with his or her computational DNA and applied mathematics on themes associated with quantum in the University of Grenoble Alpes.

RESEARCH

Research laboratory: **LIG (UMR 5217 Grenoble-INP, UGA et CNRS)**

Website: **http://www.liglab.fr/**

Contacts: **noel.de-palma@grenoble-inp.fr**

Grenoble Informatics Laboratory (LIG) is one of the largest laboratories in Computer Science in France. It is structured as a Joint Research Center (French Unité Mixte de Recherche - UMR) founded by the following institutions: CNRS, Grenoble Institute of Management and Technology (Grenoble INP IIM), Inria Grenoble Rhône-Alpes, Grenoble Alps University.
500 members of LIG (faculty, full-time researchers, PhD students, administrative and technical staff) are distributed over three sites in Grenoble and its suburbs: the Saint Martin d'Hères Campus, Minatec, and the Montbonnot Campus.
The mission of LIG is to contribute to the development of fundamental aspects of Computer Science (models, languages, methodologies, algorithms) and address conceptual, technological, and societal challenges. Increasing diversity and dynamism of data, services, interaction devices, and use cases influence the evolution of software and systems so they need to guarantee the essential properties such as reliability, performance, autonomy, and adaptability.
Addressing such challenges is the objective of 24 research teams organized into 5 focus areas:
   Data and Knowledge Processing at Large Scale,
   Distributed Systems, Parallel Computing, and Networks.
   Formal Methods, Models, and Languages,
   Interactive and Cognitive Systems,
   Software and Information System Engineering.
LIG focuses on the fundamentals of Computer Science and experimental developments while taking into account new societal challenges.

Research profile:
The notion of computation, which is clearly essential in computer science, can be modeled in several different ways.
The study of these various models requires to define notations, languages and various theoretical and practical tools to analyse the properties of these computations: verification, analysis of their behavior, complexity etc.

Classical computation models, such as Turing machines, logic or lambda-calculus, are still prominent and must be adapted and extended to support the evolution of these systems and uses. In parallel, new computation models are emerging, inspired by

disciplines outside of computer science.

For instance quantum computing, that seeks to exploit the properties of quantum systems to compute in a more efficient way, is a new computation paradigm that may lead to major breakthroughs in numerous application domains, and for which Grenoble enjoys a very favorable environment.

The aim of this position is to strengthen and supplement the research on computation models that is carried out at the LIG. The candidate's work can cover all aspects related to new computation models or to quantum computation and information, from the definition and the theoretical study of these models to formal methods for the verification and the analysis of these computations (program or protocol verification, logic, automated reasoning, complexity, information theory, cryptography, algorithms etc.).

PARTICULARITIES AND CONSTRAINTS

Administrative activities related to the duties of professors: component, teaching or research unit responsibilities, course or year responsibilities.

HOW TO APPLY

Online application must be done on the website Galaxie from   2021, 10 am (GMT+1) to   2021, 16 pm (GMT+1). Postal applications won't be accepted.

The interview will include simulation/situational exercises. The interview will be held in French; a part of it could be held in English. Further information will be provided with the letter of convocation.