



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.

Phd in RF and mmW electronics

Job reference number	2024-PHDRFMMW-TIMA
Research field	RF/mmW Electronics
Host laboratory	TIMA (UMR 5159Grenoble-INP, UGA and CNRS) / Website: https://tima.univ-grenoble-alpes.fr
Researcher profile	First stage researcher - doctorate (R1)
Location	Grenoble, France
Hiring date / contract term	01/09/2024 (36 months)
Contacts	florence.podevin@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 socio-economic 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

TIMA (Techniques de l'Informatique et de la Microélectronique pour l'Architecture des systèmes intégrés) is a public joint research laboratory of the CNRS, Grenoble-INP and UGA (Shared Research Unit #5159). TIMA is a multinational team, with members and interns from all over the world. A large proportion of the research is performed in the context of cooperative projects with industrial and academic partners, supported by regional, national and European grants.

The research topics of TIMA cover the specification, design, verification, test, CAD tools and design methods for integrated systems, from analog and digital components on one end of the spectrum, to multiprocessor Systems-on-Chip together with their basic operating system on the other end.

The proposed position will be attached to the RMS team at TIMA. The Reliable RF and Mixed-signal Systems group (RMS) is focused on the design, test and control of analog/mixed-signal/RF/mm-Wave integrated circuits and systems. The work of the team is included in the Laboratory themes of "Robustness, reliability and test", "Design of AMS/RF devices, circuits and systems" and "Machine learning-based modeling of AMS/RF circuits and systems".

Job description :

The objective of the thesis is to propose some technical breakthroughs in the distributed amplification domain and to provide innovative solutions to the current blocking points in order to achieve, in CMOS technology, a band-gain product per unit of consumption and surface area of 20 GHz/mW.mm², that is to say equivalent to that obtained by a bipolar circuit. This project will rely on the performances offered by STMicroelectronics' 55nm BiCMOS technology with the aim of promoting this technology.

Breakthroughs could be summarized in 3 bullets:

- Technology: The more advanced the technological node in silicon, the more the transistors will be capable of providing gain at high frequency but the higher will be the surface cost. The same observation is made when using III-V technologies naturally suitable to millimeter waves. Meanwhile, distributed amplification is inherently bulky. It is thus a key point to reduce the silicon surface area with smart architectures whilst keeping the same electrical performance.
- Consumption: Resistive losses at high frequency (skin effect in particular) impact the gain level, compensated by an additional DC power supply. It is the Product-Gain-Band/DC Consumption factor of merit which is then important: FoM=GBP/Pdc. Technologies to address high FoM are often the most expensive.
- Millimeter-wave expertise: The design of a distributed amplifier is not complicated but complex and requires experience, expertise, design and test tools adapted to millimeter-wave frequencies. TIMA has the expertise and access to design and test tools. The candidate will gain experience and skills in the field of millimeter-waves at the end of her/his three years of doctorate.

Specific requirements or conditions

Proficiency in English is required. French speaking would be a plus.

Specifics of the position:

Knowledge in analog-RF-mmW integrated circuit design and CAD tools is required.

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: florence.podevin@grenoble-inp.fr

Application deadline : 27/06/2024