



NEW COMPUTING PARADIGMS, CIRCUITS AND TECHNOLOGIES, INCL. QUANTUM

A computing paradigm can be defined as the way a computing machine processes information. It is characterized by the coding scheme used to represent information, the architecture of the computer and the technology it is based upon.

In the last few years, the architecture of standard computers (a.k.a. von Neumann Architecture) has evolved in many ways. The clock frequency of single cores has come to a limit and large multi-cores micro-processors are now widely spread. The introduction of a range of co-processors such as GPUs, TPUs or FPGAs has enhanced the computing performances on more complex data structures like large matrices and tensors. Furthermore, the emergence of novel ways to process information like neuromorphic or quantum is also introducing radically new computing

paradigms such as the QuCube European quantum computing project.

Research in new computing paradigms spans from advances in circuit design based on new technologies to novel software and programming techniques. In this multidisciplinary context, CEA benefits from strong teams in both the embedded domain and the High-Performance Computing domain, and is strongly involved in several advanced research programs from neuromorphic to quantum computing. R&D on new computing paradigms will be key to the development of future high-end applications using more pervasive and energy efficient solutions for artificial intelligence, advanced cryptography and optimization techniques.

WHY A PHD RELATED TO NEW COMPUTING PARADIGMS, CIRCUITS AND TECHNOLOGIES, INCL. QUANTUM AT CEA TECH?



CEA-Tech is at the crossroad of the best research in hardware, systems and software technologies for the development of future computing solutions, with strong recognition from its world-wide partners. PhD Students at CEA-Tech will have the opportunity to work with the best teams in the field, and in a rich network of partners, often among the world-class leaders. PhD Students will have access to a broad range of research teams and an up-to-date design platform and tools: advanced embedded computing, compiler and software engineering, neuromorphic and quantum computing, system level design and modeling, and circuit design using

advanced technologies.

PhD student will benefit from cross-fertilization and transverse contributions from LIST institute offering solutions on the digital domain, and LETI institute preparing advanced nano-technologies, located in Saclay (near Paris) and Grenoble. If you want to revolutionize computing architectures with advanced concepts and technologies, including a state of the art 300mm clean room, this is the place to be !



CEA-List Institute in Paris Saclay or
CEA-Leti Institute in Grenoble Alpes



25 ongoing PhD projects



CEATECH SCIENTIFIC AND TECHNOLOGICAL CHALLENGES

CEA Tech tackles the three key and ongoing transitions of the 21st century: numeric, energy and medical ones. For each, CEA Tech research teams innovates within a vibrant network of academic and industrial partnerships, to develop the technologies of the future.

CEA Tech, one of the four CEA research divisions, relies on three large research Institutes, two in Grenoble, Leti and Liten and one in Saclay, List, and a network of technology transfer facilities in Bordeaux,

Nantes, Toulouse, Metz, Cadarache and Lille.

Close to 500 young researchers, prepare their PhD in CEA Tech Labs, with a major contribution to the research teams. They share the successes of the CEA, embodied in leading publications, patents, technology transfers to industry, business and start up creation. For years, Reuters ranks CEA as one of the top three most innovative research organizations in the world (1st, 2nd or 3rd).

WHY A PHD AT CEA TECH?

Regardless of the field of research you are looking for, willing to explore prospective ideas or to further advanced technologie, you will likely find among CEA Tech doctoral positions the one that meets your expectations.

Then you can join either Leti (1800 p.) and focus on micro and nanotechnologies, embedded electronics, communications, components for the Internet of Things (IOT), cybersecurity, medical devices and healthcare outpatients (at Clinattec) - or Liten (950 p.) to face the challenges of non-CO2 emitting energies (solar, batteries, hy-

drogen, biomass or smart grids) - or List (750 p.) to innovate in terms of data intelligence, cybersecurity and IOT software, manufacturing (4.0 industries), radiotherapy, health data processing - or a research team located in one of the technology transfer facilities (Bordeaux, Nantes, Toulouse, Metz, Cadarache and Lille).

Whatever the topic you select, whatever the career path you envision, joining CEA Tech for your PhD has a deep meaning. On the one hand, you will be dealing with one major societal challenge, deeply rooted in science

and technology. On the other hand, your PhD will be at the heart of highly innovative ecosystems, each offering unique opportunities in research and career paths.

Indeed, CEA Tech offers a highly efficient mix of digital and hardware skills, world-class facilities such as state-of-the-art 300 mm clean rooms, and integration facilities for hydrogen and battery technologies, and many others. CEA Tech's teams form active partnerships with other research organizations and universities, as well as active cooperation with more than 500 industrial partners in France, Europe, North America and Asia.

We will do our best to accompany your success.



CEA-List Institute in Paris Saclay or CEA-Leti Institute in Grenoble Alpes or CEA-Liten Institute in Grenoble Alpes



500 ongoing PhD projects