

FACTORY OF THE FUTURE

INCLUDING ROBOTICS AND NON DESTRUCTIVE TESTING

The Factory of the Future represents the next industrial revolution. It will be as disruptive as the introduction of the steam engine in the 18th century which allowed mechanized production, the advent of mass production at the end of the 18th century thanks to electric power, and the development of automated production in the middle of the 20th century by means of machine control and first industrial robots. Now, at the turn of the 21st century, a new paradigm shift is underway.

By combining distributed sensors and IoT, Big Data, cloud computing, robotics and control technologies, this fourth industrial revolution will deeply change the way we produce goods. Factories in the future will be connected and sophisticated. They will be more energetically and environmentally efficient,

more agile and human centered, more productive and more competitive.

CEA Tech ambitions to be at the forefront of this revolution. Therefore, it develops world class research and developments at the heart of this transformation, focusing especially on flexible digital factory technologies (IoT, data mining, cybersecurity, digital twin, predictive maintenance, ...), advanced control solutions (non destructive testing, on-the fly control) and physical and cognitive assistance to the factory operators (collaborative robotics, exoskeletons, virtual and augmented reality, ...).

This research aims at giving France and Europe competitive advantages allowing them to maintain their rank and influence, for the benefits of the European citizens and the society at large.

WHY A PHD RELATED TO FACTORY OF THE FUTURE INCLUDING ROBOTICS AND NON DESTRUCTIVE TESTING AT CEA TECH?

CEA Tech orients in particular its research and developments in innovative robotics, cobotics and exoskeletons hardware and software solutions, state of the art solutions for virtual, augmented and mixed realities, front edge developments in multimodal interfaces and tangible devices, and cutting edge sensors and algorithms for non-destructive control.



CEA Tech has been working for years on these subjects and has for example gained a recognized position on human robot cooperation. Today, these activities take advantage from the new perspectives offered by the recent progresses of Artificial Intelligence technologies.

This world class research benefits from a rich environment. PhD candidates can for example access state of the art cobotics and exoskeleton prototypes within SMART Platform in Saclay. They will find rich software environments for real time physically realistic simulation of the factory (digital twin) and for user assistance through augmented reality. Front end non destructive control hardware and

software solutions are also available at the Saclay GERIM platform.

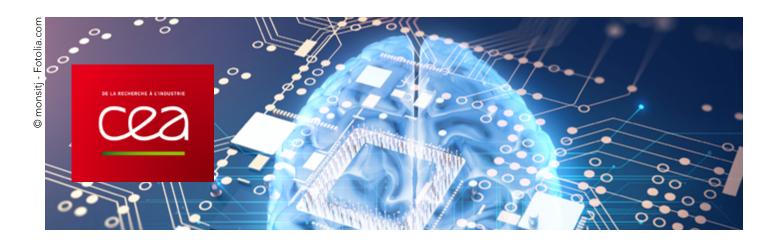
PhD candidates will also benefit from the project-based culture of CEA Tech's scientists, engineers and technicians who develop complete solutions, from the initial concept down to working demonstrators. Indeed, they will have a privileged access to enduser and technological providers from spin-offs to large groups like Haption, RB3D, Isybot, Diota, M2M...

9

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



25 ongoing PhD projects



CEATECH SCIENTIFIC AND TECHNOGICAL 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 Clinatec) - 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