

## DRF: Thesis SL-DRF-20-1004

### RESEARCH FIELD

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Particle physics / Corpuscular physics and outer space

### TITLE

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Advanced artificial intelligence techniques for the event filtering at the CMS detector

### ABSTRACT

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After a very successful operation period crowned with the discovery of the Higgs boson, the Large Hadron Collider will undergo a luminosity upgrade where it is planned to increase the collision rate by a factor of ten. The CMS detector will also be upgraded to cope with these challenging environment and to enable a better event reconstruction, particularly with the new high-granularity calorimeters. Collecting, filtering and processing the data from these detectors will pose a significant challenge. In order to make the most out of it, the modern artificial intelligence techniques will be essential. We are looking for an enthusiastic student who will study the possible machine learning techniques that can be implemented in the Field Programable Gate Arrays (FPGA) to enable very high-speed reconstruction and filtering of this immense amount of data.

### LOCATION

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Institut de recherche sur les lois fondamentales de l'univers  
Département d'Electronique, des Détecteurs et d'Informatique pour la physique  
Systèmes Temps Réel, Electronique d'Acquisition et Microélectronique  
Place: Saclay  
Start date of the thesis: 01/10/2020

### CONTACT PERSON

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### UNIVERSITY / GRADUATE SCHOOL

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Paris-Saclay  
PHENIICS

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