SECTOR: Higher Education Institution

INSTITUTION: Univ. Grenoble Alpes, University of Innovation

One of the major research-intensive French universities, Univ. Grenoble Alpes\(^1\) enjoys an international reputation in many scientific fields, as confirmed by international rankings. It benefits from the implementation of major European instruments (ESRF, ILL, EMBL, IRAM, EMFL\(^*\)). The dynamic ecosystem, grounded on a close interaction between research, education and companies, has earned Grenoble to be ranked as the 5th most innovative city in the world. Surrounded by mountains, the campus benefits from a natural environment and a high quality of life and work environment. With 7000 foreign students and the annual visit of more than 8000 researchers from all over the world, Univ. Grenoble Alps is an internationally engaged university.

A personalized Welcome Center for international students, PhDs and researchers facilitates your arrival and installation.

In 2016, Univ. Grenoble Alpes was labeled «Initiative of Excellence ». This label aims at the emergence of around ten French world class research universities. By joining Univ. Grenoble Alpes, you have the opportunity to conduct world-class research, and to contribute to the social and economic challenges of the 21st century ("sustainable planet and society", "health, well-being and technology", "understanding and supporting innovation: culture, technology, organizations" "Digital technology").

\(^*\) ESRF (European Synchrotron Radiation Facility), ILL (Institut Laue-Langevin), IRAM (International Institute for Radio Astronomy), EMBL (European Molecular Biology Laboratory), EMFL (European Magnetic Field Laboratory)

Key figures:

- + 50,000 students including 7,000 international students
- 3,700 PhD students, 45% international
- 5,500 faculty members
- 180 different nationalities
- 1st city in France where it feels good to study and 5th city where it feels good to work
- ISSO: International Students & Scholars Office affiliated to EURAXESS

LOCATION: France, Grenoble

\(^1\) https://edu.univ-grenoble-alpes.fr/en/
MANDATORY REFERENCES:
PROJECT TITLE: MIAI @ Grenoble Alpes
JOB PROFILE (Title): Post doc in neuromorphic systems
SCIENTIFIC HOSTING DEPARTMENT (LABORATORY'S NAME): Laboratory for Psychology & NeuroCognition, CEA
SUPERVISER'S NAME: Martial Mermillod & Marina Reyboz
CONTACT: Martial.Mermillod@univ-grenoble-alpes.fr

RESEARCH FIELD:
Deep neural networks; Recurrent neural network; Generative adversarial attacks, Neural Computation; Cognitive Psychology; Cognitive Neuroscience

RESEARCHER PROFILE:
Established researcher (Researchers who have developed a level of independence)

JOB PROFILE (Description): Convolutional Neural Networks (CNN) suffers from an over-representation of texture information\(^1\) for which humans are almost not sensitive. For instance, a cat with a skin of elephant will be recognize with a high level of confidence as an elephant. To explain this difference, psychological and neuroscientific experiments on humans have shown that they rely on specific spatial frequency processing of visual information in the primary visual system. We assume that this process could be an efficient way, and actually an even more efficient way compared to the state-of-the-art in computer vision (that is based on shape extraction) in order to avoid the over-sensitivity of CNN to textures.

The first task of the applicant is to study the set of RNNs or other kind of NNs available in the literature aiming at creating a criterion of selection. The performance of the models for the prediction and classification of the image frequency spectrum will determine the criterion value. Once selected/improved the model that will process a wide range of image frequencies, the applicant will integrate the module on an online learning framework.

Research tracks:
1. To study the set of RNNs or other kind of NNs and create a model selection criteria
2. Model implementation (classification/prediction) for a wide range of image frequencies
3. To merge model into an online learning framework

Required languages: French or English

TYPE of CONTRACT: temporary, up to 12 months
JOB STATUS (Full time or part time): Full time
HOURS PER WEEK: 35
CONTRACT STARTING DATE: 01/10/2019
APPLICATION DEADLINE: 30/08/2019

ELIGIBILITY CRITERIA
The candidate will require a deep comprehension in neural network modelling as well as good theoretical and methodological knowledge in psychology and cognitive neuroscience. More specifically, the researcher will require strong skills in programming neural networks (Tensor Flow and/or PyTorch) together with a good knowledge of temporal sequence acquisition and consolidation in artificial neural networks.

Applicants must hold a PhD degree (or be about to earn one) or have a University degree equivalent to a European PhD (8-year duration)

Applicants will have to send an application letter in English and attach:
- Their last diploma
- Their CV
- Letters of recommendation are welcome.

Address to send their application to: Martial.Mermillod@univ-grenoble-alpes.fr