MINERVA – Machine Learning for Radioastronomy at Observatoire de Paris

MachINe lEarning for Radioastronomy
at obserVatoire de PAris

Open Position 2

Post-doctoral Position at LESIA, Observatoire de Paris

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Object : MINERVA Application

The LESIA/Observatoire de Paris is seeking candidates for a 2-years position at LESIA on Machine Learning for Radio-astronomical Transients, Times series and Spectrograms.

The position is open for September 2020.

Organization: LESIA, Observatoire de Paris
Street Address : 5, place Jules Janssen
City: Meudon
Zip/Postal Code: 92195
Country: France

The position is open within the **MINERVA** project (Machine Learning for Radioastronomy at Observatoire de Paris. This project federates astrophysicists interested in a variety of astrophysical phenomena. https://vm-wordpress-lerma01.obspm.fr/minerva/

Radioastronomy is experiencing an explosion of volumes of observational data with the development of giant interferometers (LOFAR, ALMA, NenuFAR, SKA). These instruments produce huge and numerous two and four-dimensional datasets (among the 2D-spatial, 1D temporal and 1D spectral coordinates, depending on observation mode). Faced to these daily TB-scale data (PB-scale with SKA), the traditional methods of source and event detection and classification reach their limits. In parallel, machine learning methods have undergone algorithmic developments that bring them to a high level of maturity.

The goal of this project is to perform pilot implementation of new methods for (i) transient radio sources classification based on their morphology in Time-Frequency domain (such as Solar bursts or Jovian emissions, Pulsars, Fast Radio Bursts (FRB), Earth and planetary lightnings, etc), (ii) real-time event detection and classification on radio-astronomical observed data streams and (iii) processing of multi-instrument and multi-wavelength aggregated data, including triggering from external event detections for low frequency follow ups (such as FRB, GRB (Gamma Ray Bursts), GW (Gravitational Waves), etc).

The successful candidate will carry out an inventory of existing methods and design new tools that shall be applied to spectro-temporal data streams and to large quantities of such data.

MINERVA will make use of datasets from NenuFAR, NDA and LOFAR. The new algorithms will also be tested against existing data collections and event lists.

Applicants should have at least an engineer diploma in the field of Machine Learning or a PhD in physics, astronomy, or computer science by the time of the appointment. Experience in Astronomy is not mandatory. We

encourage applications from candidates with a strong expertise in either the manipulation or the development of state-of-the-art Machine Learning methods. Experience with manipulating images and data cubes will also be considered. Skills in one or several programing languages (e.g. Python, Fortran, C++) are necessary.

The successful candidate will have access to computing resources dedicated to MINERVA (a dedicated server with GPUs).

The Observatoire de Paris maintains a lively visitor program and hosts regular workshops and conferences throughout the year. The successful candidate will be immersed in an internationally visible research environment in the Paris and Meudon Campuses, with rich intellectual and computational resources.

The main office of the successful candidate will be located in Meudon.

The appointment is for 2 years with a salary including French social security benefits. Funding will also be allocated for travel.

Applicants should submit a CV (max. 2 pages), a publication list, a short review of previous works (2 pages), a statement of research interests (2 pages) and reference letters. Applications should be sent via email (see above).

For full consideration materials must be received before June 30st, 2020. Applications received later will be considered until position is filled.

Included Benefits: French national medical insurance, Maternity/Paternity leave, Lunch subsidies, Family supplement for children, Participation to public transport fees, Pension contributions

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