

Postdoc (24 months)**Host organization** :Unité d'Informatique et d'Ingénierie des Systèmes (U2IS), ENSTA Paris

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Postdoc in Uncertainty quantification and Deep learning

The U2iS laboratory of ENSTA Paris at Institut Polytechnique de Paris is looking for a motivated and enthusiastic young researcher to work on the detection and prediction of anomalous behaviors in multivariate time series involving noisy observations of environmental variables and industrial sensors. Founded in 1741 ENSTA Paris is the oldest "Grande Ecole" in France and is located in Palaiseau in the south of Paris.

We seek a research **post-doc** interested in **uncertainty quantification**. Deep Neural networks are increasingly overconfident and it is essential to be able to quantify their uncertainty.

The candidate should have knowledge of machine learning techniques. Computer science/ or mathematician profiles are also welcome to apply. The future applicant will be given the opportunity to apply to excellent international publications (ICML, NIPS, ICLR,CVPR, ICCV, ECCV,TPAMI, IJCV).

Goal : The aim of the postdoc will be to work on techniques or practices to quantify the uncertainty of neural networks. The postdoc might work on anomaly detection challenges [2]. It can also be considered that the postdoc will only work on theoretical issues. The postdoc will be in our team at ENSTA, which has already worked on the subject [3, 4, 5] and will be able to collaborate with Valeo teams working in reliable AI.

Depending on the candidate's profile, the future worker might focus more on the mathematical aspects of Uncertainty quantification or the computational aspects.

Your task :

- You will be in charge of projects and activities related to the research in Anomaly detection.
- You will help in improving an Anomaly detection database.
- You will lead the research work.
- You might supervise internship students.
- You will publish the results of your research in scientific international conferences and journals.

Desired profile :

- PhD or Master degree in Machine Learning, Statistics, Computer science or related fields
- Relevant scientific track record on major computer vision conferences/journals (NIPS, ICLR, ICML, CVPR, ICCV, ECCV, TPAMI, IJCV, etc.)
- Experience on machine learning and, in particular in sklearn framework
- Experience on DNN models and, in particular in Pytorch framework
- Good communication skills and ability to cooperate
- Proficient in English language (written and oral)

To formally apply, please send us an email with your resume and your reference letter.

- [1] Hawkins, Douglas M. Identification of outliers. Vol. 11. London : Chapman and Hall, 1980.
- [2] Chan, R., Lis, K., Uhlemeyer, S., Blum, H., Honari, S., Siegwart, R., ... & Rottmann, M. (2021). SegmentMelfYouCan : A Benchmark for Anomaly Segmentation. arXiv preprint arXiv :2104.14812.
- [3] Franchi, G., Bursuc, A., Aldea, E., Dubuisson, S., & Bloch, I. (2020). Encoding the latent posterior of Bayesian Neural Networks for uncertainty quantification. arXiv preprint arXiv :2012.02818.
- [4] Franchi, G., Bursuc, A., Aldea, E., Dubuisson, S., & Bloch, I. (2020). One versus all for deep neural network incertitude (OVNNI) quantification. arXiv preprint arXiv :2006.00954.
- [5] Franchi, G., Bursuc, A., Aldea, E., Dubuisson, S., & Bloch, I. (2020, August). TRADI : Tracking deep neural network weight distributions. In European Conference on Computer Vision (pp. 105-121). Springer, Cham.