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R&D Master internship

Soil contamination is the occurrence of pollutants in soil above a certain level causing a deterioration or loss of one or more soil functions. Also, soil contamination can be considered as the presence of man-made chemicals or other alteration in the natural soil environment [4-7]. These soil pollutants posed a risk to human health and/or the ecosystem. Humans can be affected by soil pollution through the inhalation of gases emitted from soils or drinking contaminated water. Also, if a food grows at contaminated soil, there is a risk that food is also contaminated [4, 5]. These pollutants may cause a variety of health problems, starting with headaches, nausea, fatigue, skin rash, eye irritation and potentially resulting in more serious conditions like kidney and liver damage and various forms of cancer [5].

ABOUT US

EvalDépol is a young company specialized in industrial site remediation. We help our clients in understanding their environmental problems and in selecting the best remediation treatment. Our laboratory, hosted in Genopole biocluster, is dedicated to soil remediation. In 2019, we developed the first on-line software dedicated to site remediation management: KiWi-Maps.com. This software allows 3D visualization and data-treatment with mathematical interpolation. We are now developing tools (software and hardware) based on artificial intelligence (machine/deep learning). Our designed algorithm can process a high number of existing data coming from polluted sites all around the world. Currently, we are integrating our artificial intelligence algorithms with our online software. It will help remediation companies in treating their data online and quickly creating interactive maps. EvalDépol is working on this project in collaboration with the Laboratory of Images, Signals and Intelligent Systems (LISSi, (EA N ° 3956) belongs to the University Paris-Est Créteil (UPEC).

OUR INTERNSHIP PROGRAM/TASKS

Evaldepol is seeking bright and highly motivated master students in France, who can work in the field of artificial intelligence. The project will develop innovative deep learning approaches for the analysis and prediction of soil pollutants. More details about the project will be given during the interview for confidentiality reasons. The selected candidate will have the chance to work in an interdisciplinary team and a big consortium of data scientists. **This internship can**

lead to a permanent contract or PhD scholarship. This internship will focus on the following areas:

- An integration of artificial intelligence algorithms with our online software.
- Improving our own solutions of deep neural networks
- Technical report writing.

ELIGIBILITY CRITERIA

- The candidate must be an M2 Master student or in 5th year of an engineering school **in France.**
- Has done M1 in computer science, applied mathematics or electrical engineering, with a focus on machine learning.
- Experience in machine learning and data analysis
- Experience in the field of software development.
- Demonstrated record of high-performance programming skills in C++/python and html.
- Demonstrated analytical, verbal, and scientific writing skills in English.

DURATION

Internship duration will be 6 months starting from January 2021 at an early date to start. The latest date to start the internship will be March 2021.

APPLICATION

Please send your CV + transcripts + cover letter + recommendation letters to Alice.othmani@u-pec.fr (before November 15, 2020).

REFERENCE

[1] Sainath, T. N., Vinyals, O., Senior, A., & Sak, H. (2015, April). Convolutional, long short-term memory, fully connected deep neural networks. In 2015 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP) (pp. 4580-4584). IEEE.

[2] LI, Xiang, PENG, Ling, YAO, Xiaojing, et al. Long short-term memory neural network for air pollutant concentration predictions: Method development and evaluation. Environmental pollution, 2017, vol. 231, p. 997-1004.

[3] Nielsen, M. A. (2015). Neural networks and deep learning (Vol. 2018). San Francisco, CA: Determination press.

[4]. Hou, D., O'Connor, D., Nathanail, P., Tian, L., & Ma, Y. (2017). Integrated GIS and multivariate statistical analysis for regional scale assessment of heavy metal soil contamination: A critical review. Environmental Pollution, 231, 1188-1200.

[5]. Bech, J. (2020). Soil contamination and human health: Part 1—preface. Environ Geochem Health 42, 1–6.

[6]. Fan, Y., Zhu, T., Li, M., He, J., & Huang, R. (2017). Heavy metal contamination in soil and brown rice and human health risk assessment near three mining areas in central China. *Journal of healthcare engineering*.

[7] Carré, F., Caudeville, J., Bonnard, R., Bert, V., Boucard, P., & Ramel, M. (2017). Soil contamination and human health: A major challenge for global soil security. In *Global Soil Security* (pp. 275-295).