

Internship position (Master 2)

Deep Learning Models for Analysis of Satellite Images and Prediction of Natural Disaster Impacts

Context: The internship is part of the [DLISCES project \(Deep Learning Images Satellites et Cartographie d'Indicateurs Économiques et Sociaux\)](#), supported by the [International Research Center "Natural Disasters and Sustainable Development" \(CIR4\)](#) of the ISite CAP 2025 in Clermont-Ferrand. The project falls under the "AI for Good" domain and conducts exploratory research aimed at providing maps of various indicators to more robustly assess the vulnerability of populations and territories exposed to climatic hazards (floods, landslides, cyclones, earthquakes, etc.). DLISCES is an interdisciplinary project involving researchers in artificial intelligence, economics, management, and mathematics. The selected candidate will join the [LIMOS \(Laboratoire d'Informatique, de Modélisation et d'Optimisation des Systèmes\)](#) and work closely with AI researchers and economists from CERDI ([Centre d'études et de recherches sur le développement international](#)). He or she will focus on leveraging state-of-the-art deep learning models and satellite images to evaluate the impact of natural disasters.

Location: LIMOS, Aubières (Clermont-Ferrand)

Duration: 5 months

Preferred Start Date: March 1st, 2026

Internship Description: This internship aims to develop and apply deep learning (DL) models and resources for satellite images analysis in the goal of predicting natural disaster impacts. On one hand, the EM-DAT database contains data on the occurrence and impacts of over 27,000 mass disasters worldwide from 1900 to the present day. On the other hand, computer vision techniques utilizing DL enable efficient analysis of Earth Observation data acquired through remote sensing technologies.

The goal of the internship is twofold :

1. Collect satellite images related to natural disaster events recorded in the EM-DAT database with geolocation provided by Geo-Disasters, from open-access platforms such as Copernicus and Google Earth Engine (GEE).
2. Study, apply, and fine-tune pre-trained DL models (foundation models for Earth Observation) to represent remote sensing information, aiming to predict natural disaster impacts as recorded in the EM-DAT database.

Particular attention will be paid to floods and the related dataset FLODIS, based on EM-DAT. This internship provides a valuable opportunity to work on impactful projects in the field of natural disaster risk management while gaining practical experience in deep learning and satellite image analysis. The opportunity to continue this work with a PhD project is currently under review.

Desired Profile:

- Current master student or recent graduate in Computer Science, AI, Data Science, Computer Vision, or in Social Science with a strong background in Data Science.
- Experience using deep learning models in computer vision.
- High Interest in inter-disciplinary research works.
- Attention to details and rigor in handling large datasets and in programming.
- Strong communication skills and ability to work in a team.
- Knowledge of satellite imagery and geospatial data would be a plus.

Technical Skills Required:

- Proficiency in Python and deep learning libraries related to the subject (PyTorch, torchvision, etc.).
- Knowledge of image processing libraries (OpenCV, PIL, etc.) would be a plus.
- Experience in natural disaster risk management or satellite image interpretation would be a plus.

How to Apply:

Interested candidates are invited to send their CV, a cover letter, transcripts of records (Licence and Master) and any relevant projects or portfolios to julien.ah-pine@sigma-clermont.fr, michael.goujon@uca.fr and khaled.al_saih@uca.fr. Please use the subject line:

"Application for Internship – Satellite Image and EM-DAT."

We encourage applications from individuals passionate about AI, remote sensing, and humanitarian impact. We look forward to receiving your application wœwœ!

List of Illustrative References :

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- Burke, M., Driscoll, A., Lobell, D. B., & Ermon, S. (2021). Using satellite imagery to understand and promote sustainable development. *Science*, 371(6535), eabe8628.
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- Delforge, D., Wathelet, V., Below, R., Sofia, C. L., Tonnelier, M., van Loenhout, J. A., & Speybroeck, N. (2025). EM-DAT: the emergency events database. *International Journal of Disaster Risk Reduction*.
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- Mester, B., Frieler, K., & Schewe, J. (2023). Human displacements, fatalities, and economic damages linked to remotely observed floods. *Scientific data*, 10(1), 482.
- Rosvold, E. L., & Buhaug, H. (2021). GDIS, a global dataset of geocoded disaster locations. *Scientific data*, 8(1), 61.
- Teber, K., Weynants, M., Gans, F., & Mahecha, M. D. (2025). Geo-Disasters: geocoding climate-related events in the international disaster database EM-DAT. *Big Earth Data*, 1-16.
- Zheng, Z., Ermon, S., Kim, D., Zhang, L., & Zhong, Y. (2024). Changen2: Multi-temporal remote sensing generative change foundation model. *IEEE Transactions on Pattern Analysis and Machine Intelligence*.