

Artificial Intelligence and Machine Learning for Geosciences

Objectives

This course provides attendees with an introduction to the fundamental tools underpinning Artificial Intelligence (AI) algorithms, from linear regression to deep neural networks. The machine learning cookbook, that comprises training, testing and subsequent generalization will be illustrated by a series of hands-on tutorials. These will cover the problems of classification and regression using a series of homemade notebooks deployed over hybrid CPU and GPU architectures.

More information and registration link: <https://shorturl.at/xv9JS>

Requirements

This training is aimed at geophysicists willing to develop an operational sense of AI, with a working knowledge of Python. Attendees with a lack of knowledge of Python will be provided with an upgrade notebook beforehand. Background in inverse problems, statistics or data assimilation is a plus.

Speakers

- Hugo Frezat (ChEESE postdoc, IPGP/CNRS)
- Léonard Seydoux (Assistant Professor, IPGP, on best effort)
- Alexandre Fournier (Senior professor, IPGP)
- Geneviève Moguilny (Research engineer, CNRS/IPGP, on best effort)

Learning Outcomes

Recognize the possibilities offered by AI for one's research project. Identify the scientific problems that can be resolved by AI.

Develop a practical understanding of the algorithms behind AI by autonomously designing solutions during the hands-on, based on NumPy and Scikit-Learn.

Analyze datasets with supervised and unsupervised learning methods for both classification/clustering and regression/dimension reduction.

Implement deep learning models in Python using the PyTorch, TensorFlow and JAX libraries and train them with real datasets.

Materials

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4 CPU/attendee is a minimum + 1 GPU available ¼ of the time fully for each attendee. The data storage needs can approach 100 GB

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