Geophysicist - Apprenticeship 2024

Company Description

CGG (https://www.cgg.com/geoscience) is a global geoscience technology leader and industry pioneer with a history of over 90 years of pushing the scientific boundaries of what is possible. Employing around 3,500 people worldwide, we provide a unique range of data, products, services and solutions to solve the complex natural resource, environmental and infrastructure challenges of our clients. CGG is listed on the Euronext Paris SA (ISIN: 0013181864).

Job Description

This role is for physicists, mathematicians and geophysicists interested in following IFP School Master in Petroleum Geociences, who are looking for an apprenticeship where they can put their theoretical knowledge and problem solving skills to the test working on real Earth data. The role is based in Massy, a town in the greater Parisian region of France.

What will you learn?

The world beneath our feet is both incredibly complex and the source of the natural resources fundamental to the functioning of our society. We use the latest signal processing, modelling and imaging techniques and among the most advanced compute facilities in the world to build high-resolution 3D images and models of subsurface structure and rock properties for our clients.

During your apprenticeship, you will develop new, innovative solutions to problems plaguing the seismic imaging field. You will use knowledge of signal processing, wave propagation, and numerical optimization to develop and test high-end algorithms, sequences, or programs with predefined geophysical or engineering content.

You will participate in the validation of your contributions with senior Research staff and Production staff by analyzing and evaluating processing and imaging results on synthetic and field data. You may work independently or as part of team, but always in close collaboration with Imaging Geophysicist, remaining in-tune with production demands and industry trends.

You will also work closely with Software Engineers on the development, deployment, and improvement of high-performance computing applications on GPU and CPU architectures based on new imaging techniques and technological advances. You may be asked to present your work and results to colleagues and clients, as well as externally at conferences.

You will have the opportunity to work on ***one of the following topics***:

Land processing & Imaging: Within one of our teams dedicated to ultra-high-density processing and imaging for land data, you will be in charge of:

- Organizing a large dataset - several hundred Terabytes per step of processing
- Testing and following a processing sequence of signal processing (denoising, designature, multiple suppression)
- Building a velocity model with the latest available technologies (full waveform inversion, tomography)
- Presenting status reports to the clients each week

Marine processing & Imaging: Within one of our teams dedicated to marine processing and imaging (streamer and/or OBN/OBC), you will be in charge of:

- Testing and following a processing sequence of signal processing (denoising, designature, multiple suppression)
- Building a velocity model with the latest available technologies (full waveform inversion, tomography)
- Presenting status reports to the clients each week

4D processing & Imaging: Within one of our teams dedicated to processing and imaging of 4D monitoring data, you will be in charge of:

- Testing and following a sequence of signal processing designed to remove non-repeatable noise while preserving signal enabling to monitor reservoir evolution
- Imaging the various surveys in order to locate the 4D difference at its true geological location
- Running a preliminary analysis of the results to ensure the reservoir evolution (porosity, permeability) and possible subsidence effects have physical meaning
- Presenting status reports to the clients each week

Elastic FWI: Full waveform inversion (FWI) is now the standard solution to build a velocity model either for land or marine data. However, most FWI run in the industry are performed using acoustic modeling due to the prohibitive cost of elastic modeling. At CGG we are currently working on improving the efficiency of the elastic FWI for production, including large surveys. This will allow for the inversion of Vp, Vs and density which can be used by the reservoir department to derive rock properties such as porosity and permeability. During this internship you will be in charge of:

- Testing elastic-FWI over several different real-world datasets to monitor the appropriate estimation of Vp, Vs and density parameters
- Verifying the quality of the results with our reservoir specialists
- Optimizing the use of these tools to make them cost effective in production.

What do we look for during the application process?

- Analytical approach to problem solving
- Enthusiastic attitude towards learning and passion for your subject
- The technical agility to adapt your existing knowledge to a new field
- Ability to effectively communicate technical concepts
- Evidence of leadership, teamwork or customer service either from involvement in university societies/extracurricular activities, volunteering and/or work experience/internships.

Contacts

- Diego Carotti diego.carotti@CGG.com
- Hanh Duong Hanh.Duong@CGG.COM