Job Description

Research Engineer – Machine Learning
Alcority is a global provider of shared business services to a set of internal customers. Alcority shared services are provided through a network of service delivery centers located in New York, Dallas, Houston, and London. One of the advisory services provided by Alcority is a Virtual Innovation Laboratory (VIL) that assists customers in incubating new product and service ideas ranging from technology research up to and including technology development and demonstration.

The VIL includes a machine-learning (ML) group responsible for:

- Developing ML models to assist in design of physical systems and evaluation of mathematical constructs.
- Informing the generation of data and designs in the upstream design pipeline.
- Assisting the transition of ML models from development to deployment into the downstream design pipeline.
- Researching, recommending, and executing new ideas in the space of ML-assisted computational physics and mathematics.

Alcority is seeking candidates to join its machine-learning team at its Dallas, Texas location. The successful candidate will report directly to the Alcority VIL Program Director. Positions are full-time and include both on-site and hybrid positions. Travel to different Alcority and Customer locations to meet program requirements may also be required.

Interested candidates should apply by sending your resume to:
Nicole Rodi
VP, Human Resources, Alcority LLC
nicole.rodi@alcority.com

Position Responsibilities
The Research Engineer will be responsible for developing and implementing ML products within the ML group. Responsibilities include the following:

- Contribute to the conception, development, and execution of ML program technical tasks and activities from start to finish, including identifying processes, deadlines, and milestones.
- Execute ML technical tasks for the development and deployment of ML models as required to support overall program goals.
- Work and coordinate with other VIL technical organizations to develop ML models and tools as required to achieve program goals.
- Maintain effective communication with other members of the program technical team.
- Create technical progress reports and make presentations to VIL leadership and other stakeholders as required.
Monitor and track performance to the technical plan and keep management informed of progress through performance measures of key metrics on a regular basis.

Participate in and support VIL technical activities including the development of additional programs/projects and planning to support ongoing projects.

**Position Requirements**

**Required Requirements**

- **Required and highly desired skills:**
  - Experience building physics-informed machine learning models; alternatively, a strong background in the physical sciences coupled with a strong background in machine learning.
  - Proficiency in general-purpose machine learning platforms (Tensorflow, PyTorch), in domain-specific packages (e.g., NVIDIA Modulus), and their underlying technology base (Python, NumPy, SymPy, etc).
  - Comfort developing software in a team setting (e.g., familiarity with standard GitHub practices).
  - Demonstrated ability to reduce academic concepts (such as are published in the scientific literature) to practical application.
  - Good understanding of numerical methods, optimization techniques, and data structures.
  - Excellent communication skills and ability to collaborate with interdisciplinary teams, including computational scientists, data scientists, software developers, and decision makers.
  - Knowledge of numerical methods for solving partial differential equations (PDEs), such as finite difference, finite element, and spectral methods.
  - Ability to work independently and manage multiple tasks simultaneously while adhering to project deadlines.

**Additional desired skills:**

- Experience developing in C/C++ or Jax.
- Experience developing front-end interfaces.
- Familiarity with object-oriented programming (OOP) concepts and software engineering.
- Experience with version control systems like Git for collaborative software development.
- Knowledge of software development best practices, including unit testing, code reviews, and continuous integration and deployment (CI/CD).
- Experience with data-driven modeling, especially of physical systems and processes
- Experience with machine learning algorithms, such as neural networks, decision trees, random forests, support vector machines, etc.
- Strong knowledge of machine learning algorithms, including supervised, unsupervised, and semi-supervised learning techniques.
- Expertise in deep learning architectures such as convolutional neural networks (CNNs), recurrent neural networks (RNNs), and autoencoders.
• Experience with regularization techniques, hyperparameter tuning, and model evaluation metrics.
• Understanding of Bayesian statistics and probabilistic graphical models for uncertainty quantification.
• Understanding of clustering algorithms such as k-means, hierarchical clustering, and Gaussian mixture models.

Educational requirements:
• Ph.D. or similar experience in relevant fields.