Opportunities at the Artificial Lift and Flow Assurance Research Group - ALFA

The **Artificial Lift and Flow Assurance Research Group (ALFA)** is pleased to announce a call for applications for a **Researcher** position, focusing on *Hybrid Data and Model Systems for Monitoring Offshore Oil & Gas Wells*.

Job Opportunity

Position: Researcher I
Organization: Centro de Estudos de Energia e Petróleo (CEPETRO)
Team: ALFA Research Group
Location: On-site – Campinas, SP, Brazil
Job Type: Full-time (CLT)
Start Date: Immediate
Application Deadline: Open until filled

About ALFA

The ALFA Research Group, part of CEPETRO and the School of Mechanical Engineering at UNICAMP, is a leading research team specializing in Artificial Lift and Flow Assurance for the oil & gas industry. The research group has a strong record of academic and industry collaborations, conducting cutting-edge research that bridges theoretical development, numerical modeling, and experimental investigations. The group integrates experimental, simulation, and theoretical studies within its state-of-the-art laboratory infrastructure, fostering scientific advancement and professional training.

Position Overview

We are seeking a highly motivated Researcher I (Pesquisador I) to lead the technical development of an industry-funded research project focused on scientific machine learning, multiphase flow modeling, and data-driven methodologies for oil & gas applications. The successful candidate will oversee the development, implementation, and validation of these advanced techniques, driving both fundamental research and practical innovations in the energy sector. In this role, the researcher will be responsible for defining and implementing innovative approaches in inverse problems, virtual sensors, hybrid models, and AI-driven solutions. Beyond the primary project, this position offers opportunities for collaboration in other high-impact research initiatives, working closely with academic and industry partners to advance technological innovation in the Brazilian oil & gas sector. The Researcher I will report to Prof. Marcelo Souza de Castro at the ALFA Research Group and collaborate with a multidisciplinary team of engineers, scientists, and industry stakeholders.

Key Responsibilities

- Lead the technical execution of an industry research project, ensuring the development, implementation, and validation of advanced methodologies.

- Conduct applied research in scientific machine learning, multiphase flow modeling, and data-driven methodologies, contributing to advancements in both academia and industry.

- Develop and apply hybrid AI-physics models to enhance predictive capabilities and real-time decision-making in flow assurance and artificial lift applications.

- Work closely with industry partners, research collaborators, and internal teams to align research objectives with real-world challenges.

- Disseminate research findings through academic publications, technical reports, and industry white papers.

- Present work at international conferences and industry events.

- Participate in mentoring graduate students and assisting in research supervision within the ALFA Research Group.

Qualifications

- Ph.D. in Mechanical, Electrical, Petroleum, Chemical, or Control/Automation Engineering, Applied Mathematics, or a related field.

- Demonstrated expertise in the following areas: Artificial Intelligence (AI): Scientific machine learning, physics-informed neural networks, or data-driven modeling. Multiphase Flow: Modeling, simulation, or experimental analysis of multiphase systems.

Preferred Qualifications and Skills

- Experience leading research projects in an academic or industrial research environment.

- Proficiency in Python for numerical modeling, simulation, and data analysis.

- Experience with machine learning frameworks such as PyTorch, JAX, or TensorFlow.

- Strong mathematical and computational modeling skills, with a solid foundation in numerical methods and inverse problems.

- Experience with virtual sensors and AI-driven monitoring systems for engineering and energy applications

- A strong publication record in reputable journals and conferences relevant to petroleum engineering, computational modeling, or AI in engineering.

Why Join Us?

- Conduct research within a world-class academic environment at UNICAMP and CEPETRO, institutions recognized for excellence in energy and petroleum research.

- Access state-of-the-art computational and laboratory resources, supported by industry funding and leading academic collaborations.

- Lead high-impact projects at the intersection of scientific computing, AI, and energy applications, shaping both fundamental research and industry-driven solutions.

- Advance your career in a research leadership role, with opportunities to mentor students, collaborate with industry leaders, and develop pioneering solutions for the energy sector.

- Engage in multidisciplinary collaborations, with opportunities for conference participation.

Compensation & Benefits

- Full-time CLT position with a competitive salary based on experience and qualifications.

- Research funding support for publications, conference participation, and professional development.

- Access to UNICAMP's research ecosystem, providing networking opportunities with academic experts and industry leaders.

- Opportunities for leadership growth, including mentorship of graduate students and technical guidance in industry collaborations.

Application Process

- Applications will be reviewed **on a rolling basis** until the position is filled.

- Applicants must submit the following documents via email to William Monte Verde (**wmv@unicamp.br**). The required documents are:

  - Resume.
  - Scientific Publications and copies of your Master's and Ph.D. theses
  - Letters of Recommendation (or Contact Information for References).

  Shortlisted candidates will be invited for an interview after evaluating their documentation.