IV SEMINÁRIO DE INTELIGÊNCIA ARTIFICIAL APLICADA À INDÚSTRIA DO PETRÓLEO

Edição 2023

ABGP ASSOCIAÇÃO BRASILEIRA DE GEÓLOGOS DO PETRÓLEO

THE USE OF ARTIFICIAL INTELLIGENCE IN SUBSEA INTEGRITY

Lucas Augusto Penna de Carvalho[1], Rene Thiago Capelari Orlowski[2], Italo De Oliveira Matias[3], Eduardo Shimoda[4], Fábio Freitas da Silva[5], Marcelo Romeu Gonçalves[6], Roberto Meireles Acruche[7], Soeli T. Fiorini[8], Whanderley Souza Freitas[9], Anderson Jose Silva de Oliveira[10]

[1]Petrobras S/A (lucas.penna@petrobras.com.br)
[2]Petrobras S/A (renethiago@petrobras.com.br)
[3]PUC-RJ (italomatias@puc-rio.br)
[4]PUC-RJ (shimoda@puc-rio.br)
[5]PUC-RJ (fabio.freitas@puc-rio.br)
[6]PUC-RJ (marceloromeugoncalves@puc-rio.br)
[7]PUC-RJ (acruche@puc-rio.br)
[8]PUC-RJ (soeli@puc-rio.br)
[9]PUC-RJ (whanderley_souza@puc-rio.br)
[10]PUC-RJ (andersonjso@puc-rio.br)

The R&D project addresses the use of Artificial Intelligence in the oil and gas industry, presenting a case study on acquiring knowledge in the integrity and reliability of subsea equipment from unstructured data, primarily in PDF format. The challenge lies in the search, cataloging, and formatting of this data, leading to the development of a system composed of two services: Extractor, for mining data from inspection reports, and Interface (smartSub), for visualization and analysis. Machine Learning and regular expressions were employed in information extraction, overcoming the diversity of report structures. The resulting software offers features such as advanced search, visualization of extracted data (tables, images), statistical analysis, reliability analysis, parameter out-of-range signaling, analytical dashboard, and APIs for integration. The system's implementation enhances the efficiency of specialist activities, contributing to digital transformation in the subsea sector and providing a valuable structured historical database for analysis and decision-making. Additionally, it expands the potential to optimize inspections, leading to significant financial savings.

KEYWORDS: SUBSEA, INTEGRITY MANAGEMENT, MACHINE LEARNING