DETECTION AND SEGMENTATION IN SEISMIC IMAGENS: FROM GREED CORRELATION ALGORITHMS TO AI FUNDAMENTAL MODELS

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This talk presents the evolution of algorithms that led to today's Deep Neural Networks solutions for detecting and segmenting Horizons, Faults, Facies, and Hydrocarbon Indicators in Seismic Images. Each algorithm is based on mathematical concepts and physical interpretations of the nature of the seismic data. We will also revisit the Computational Geophysics thesis developed at the Tecgraf Institute under my supervision, which addresses the detection and segmentation of these seismic features. Finally, we will look at the prospect of adapting a Foundation Model trained in different data, such as images, texts, and speech, to perform Seismic Inversion directly from pre-stacked data.Artificial Intelligence is becoming fundamental for the next generation of complex and realistic Visualization and Computer Graphics Techniques. NeRF (Neural Radiance Fields), Gaussian Splatting and Real Time Ray tracing are being pointed as the future of real time rendering and becoming fundamental for complex visualization in Oil and Gas Industry. In this talk we will show the possibilities that may be achieved by these techniques and how they are being related to AI.