

[Click here to access Paper's Short Video](#)

Algoritmos de Otimização Binários aplicados à seleção de hiperparâmetros do Perceptron Multicamadas para identificação de Edema de Reinke

Autores ROGERIO PIGNELLI ¹, MARCELO FAVORETTO CASTOLDI ¹, MARIA EUGENIA DAJER ¹,
DANILO HERNANE SPATTI ², PAULO ROGERIO SCALASSARA ¹

Instituição ¹ UTFPR - Universidade Tecnológica Federal do Paraná, ² USP - Universidade de São Paulo

Resumo

The article presents a comparative analysis of four approaches to optimizing the hyperparameters of MLPs in the classification of Reinke's edema. The study compared a traditional metaheuristic method, PSO, and a recent one, WOA. The work's highlight came in the BPSO algorithm's performance, particularly when applied with the transfer function in S. This method achieved rapid convergence and superior results, contrasting with the rapid saturation in local maximum observed in BWOA. A comparison with random attribute selection revealed that although this approach found solutions with higher values, its random nature prevented convergence and local exploration, which are crucial characteristics in metaheuristic algorithms. The study concludes that BPSO with an S-shaped transfer function significantly improves the performance of MLPs in classifying Reinke's edema from speech samples with a sustained vowel. Future work is suggested to explore other optimization algorithms and validate these approaches on different data sets, covering classification and regression problems.

Palavras-chaves: Edema de Reinke, Otimização de Hiperparâmetros, Perceptron Multicamadas, PSO Binário, WOA Binário