Relatório Final - Experimentos MLP com Keras

Desafio 01 - Redes Neurais Artificiais

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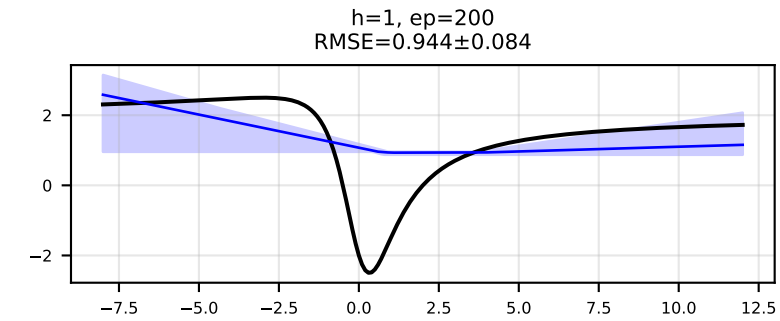
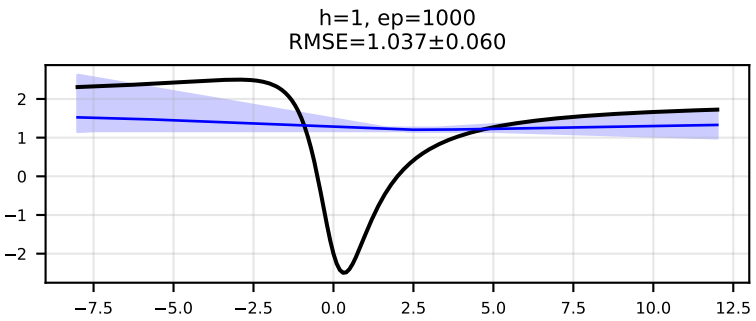
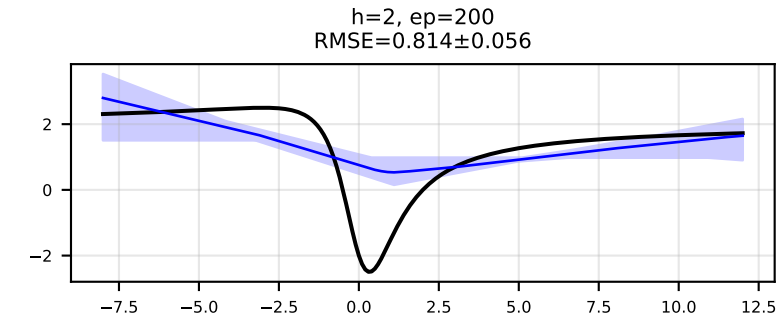
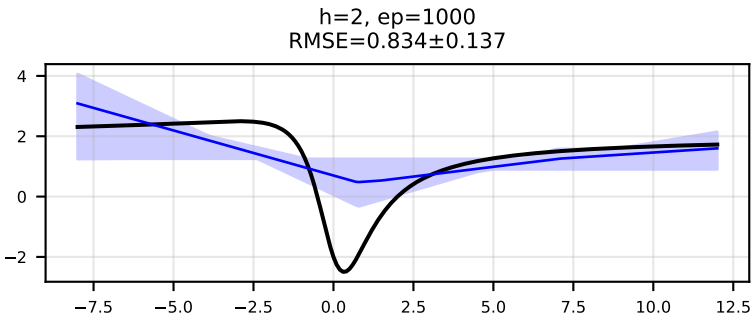
Itens avaliados:
(1) Topologia mínima com Keras
(2) Funções de ativação (ReLU, tanh, sigmoid)
(3) Avaliação de 5 repetições por configuração
(4) Relatório curto com discussão

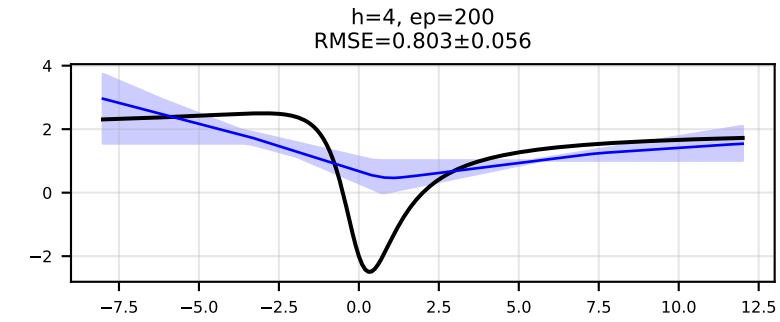
Keras - Ativação: ReLU

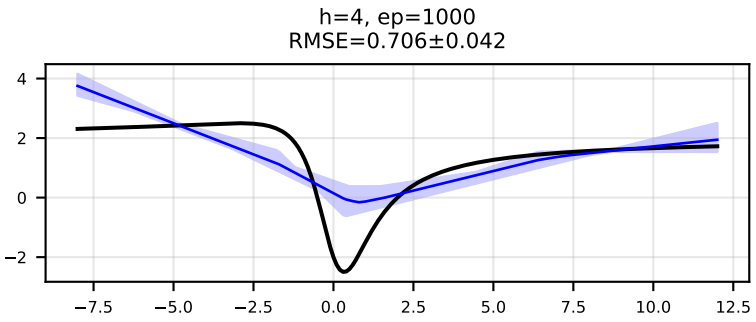


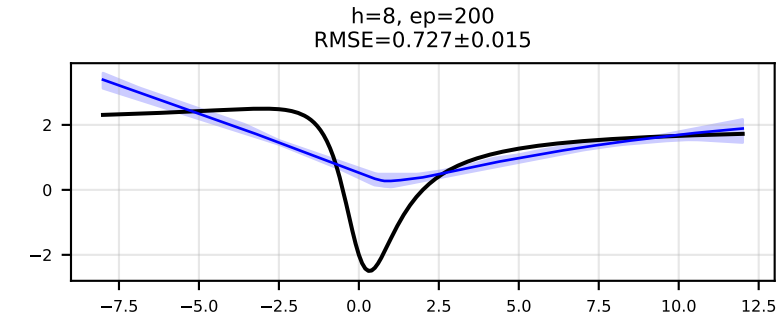


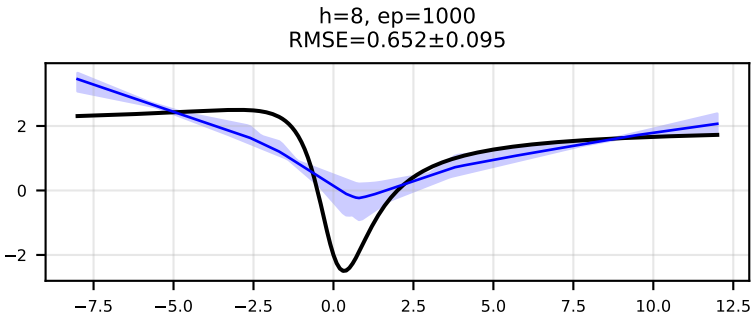


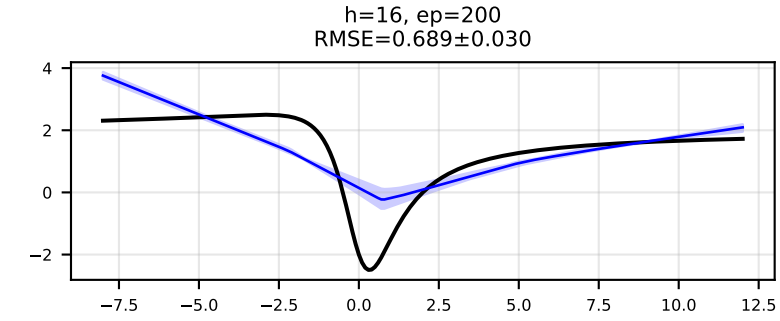


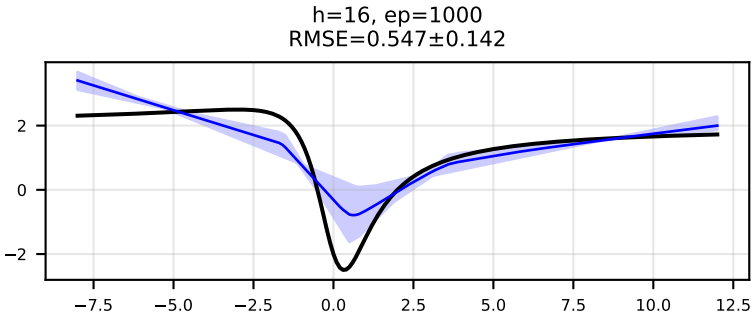


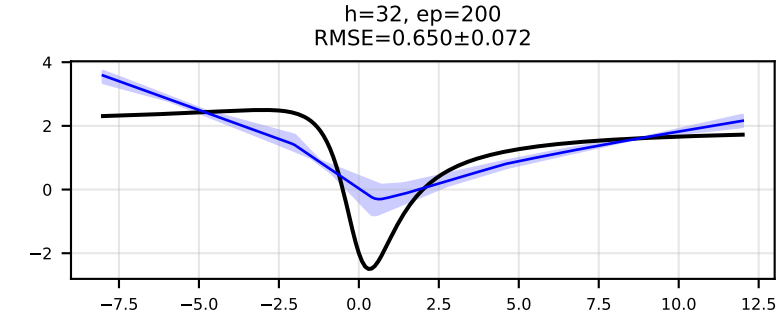


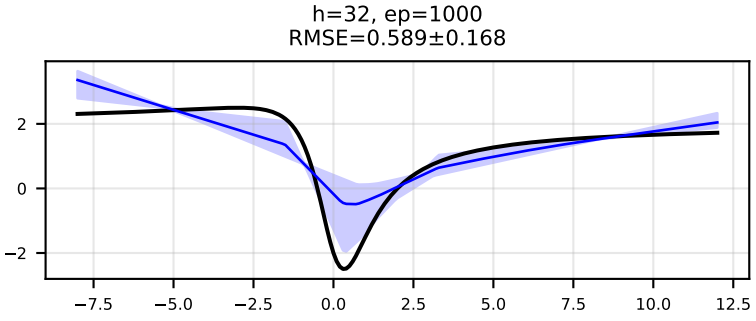












Keras - Ativação: tanh

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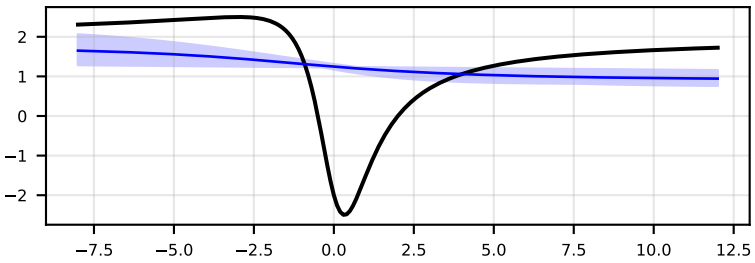
RMSE=1.041±0.032



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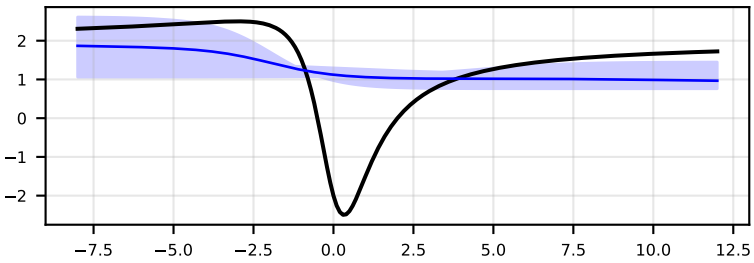

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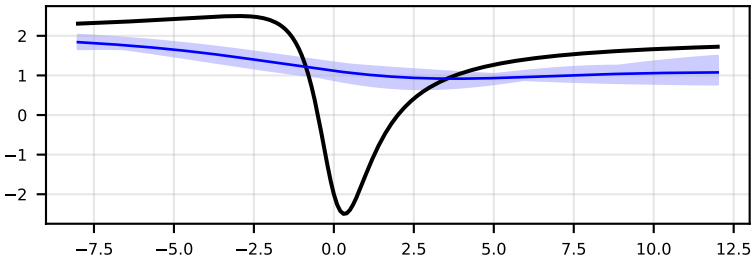

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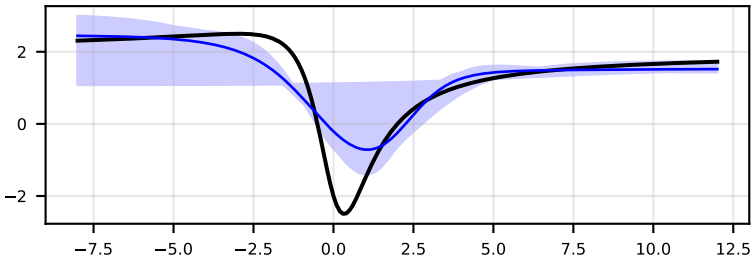

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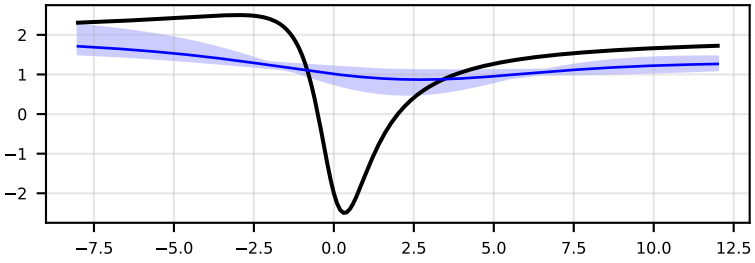

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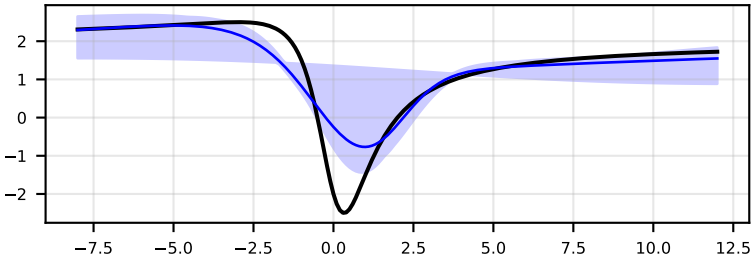

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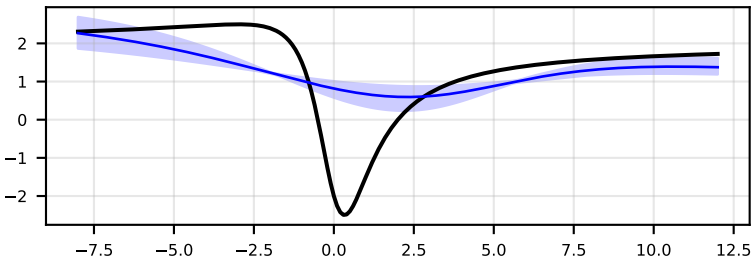

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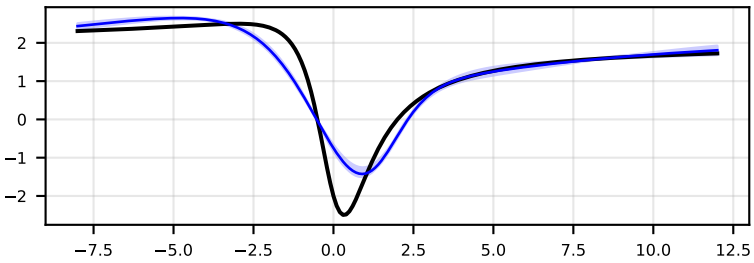

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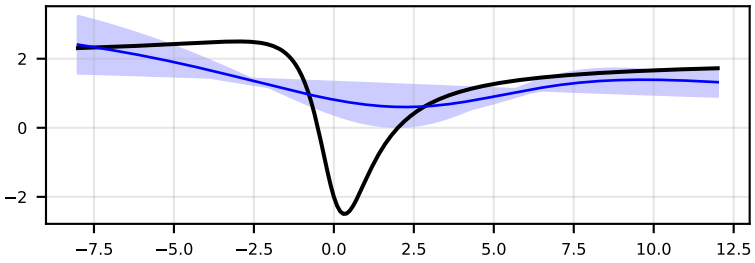

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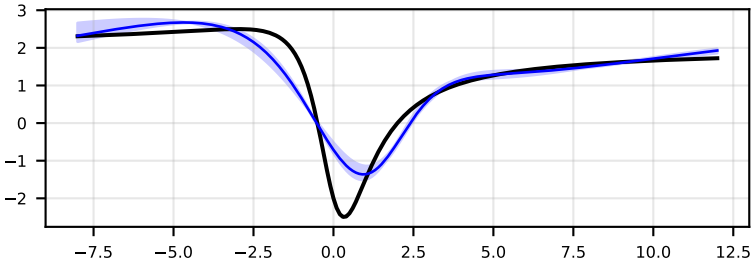

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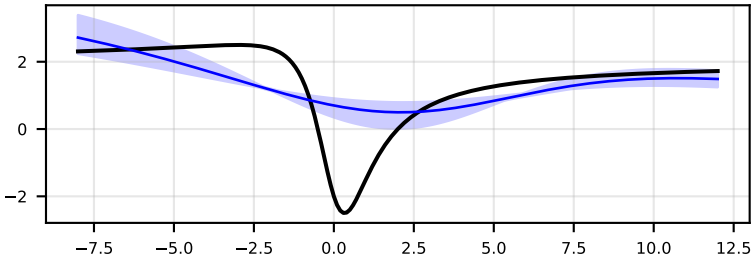

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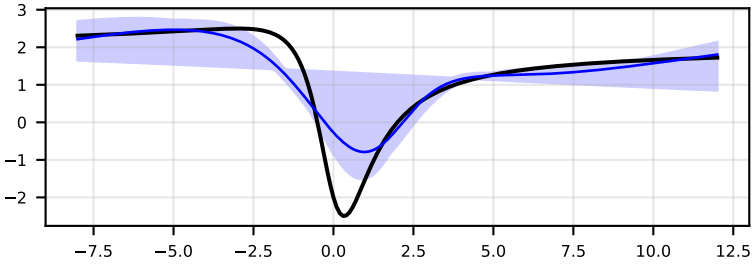

Keras - Ativação: sigmoid

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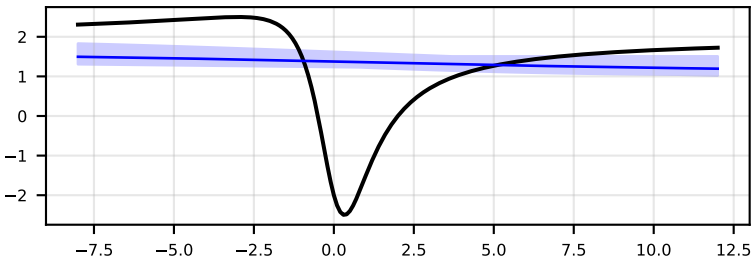

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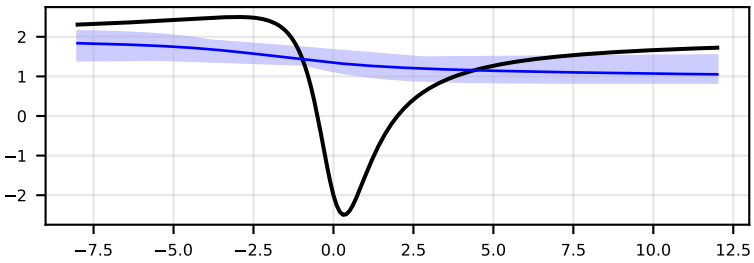

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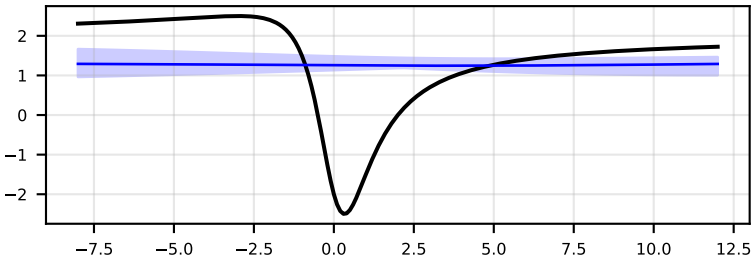

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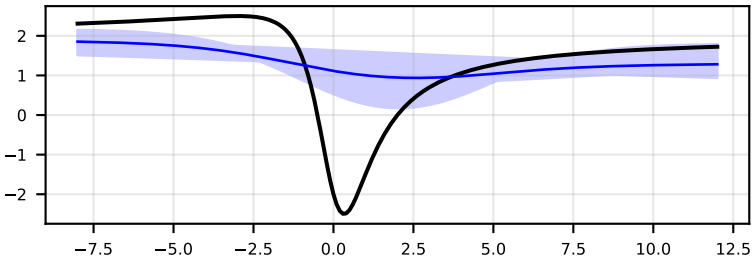

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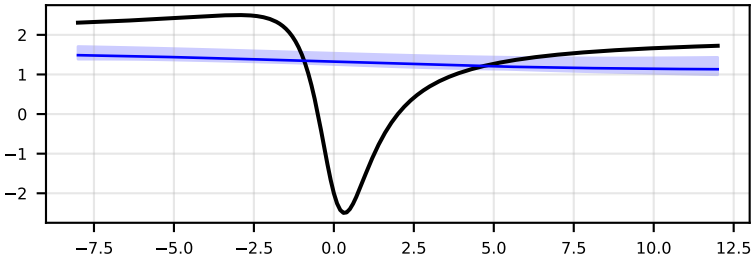

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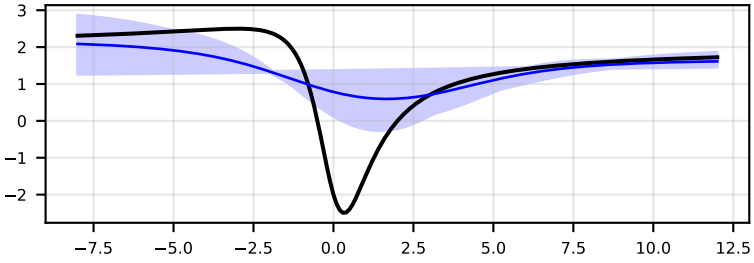

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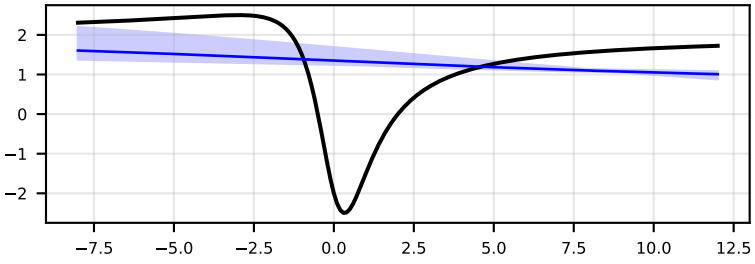

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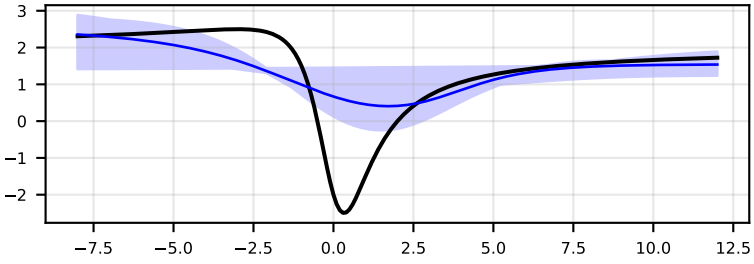

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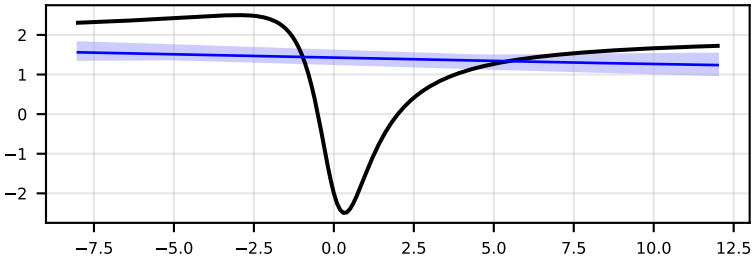

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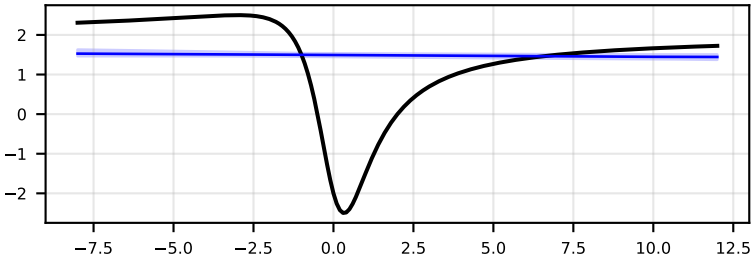

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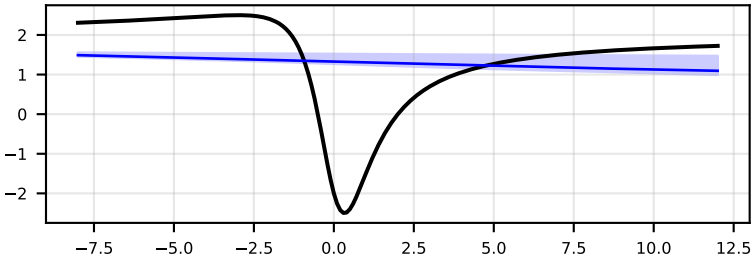

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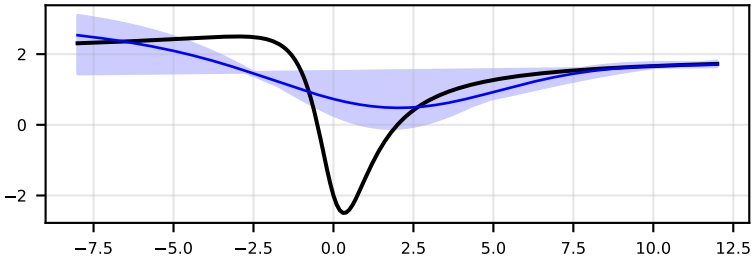

RELATÓRIO KERAS - RESULTADOS PRINCIPAIS

 Melhor configuração: tanh com 8 neurônios e 1000 épocas
RMSE médio de validação: 0.3664 ± 0.0169

OBSERVAÇÕES:
• Implementação equivalente usando Keras/TensorFlow
• Early Stopping implementado para evitar overfitting
• Otimizador Adam com learning rate padrão de 0.001
• Batch size fixo em 32 para todos os experimentos
• Mesma metodologia de avaliação do scikit-learn

COMPARAÇÃO COM SKLEARN:
• Keras oferece maior flexibilidade na arquitetura
• Controle mais fino sobre o processo de treinamento
• Possibilidade de usar callbacks (EarlyStopping)
• Facilidade para expandir para redes mais complexas