A COMPARISON OF MACHINE LEARNING METHODS FOR PRESSURE COEFFICIENT PREDICTION OF AN AERONAUTICAL CONFIGURATION

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Machine learning entails powerful information processing algorithms that are relevant for modelling, optimization, and control of fluids. Currently, machine learning capabilities are advancing at an incredible rate, and fluid mechanics is beginning to tap into the full potential of these powerful methods. Many tasks in fluid mechanics, such as reduced-order modelling, shape optimization and uncertainty quantification, may be posed as optimization and regression tasks. Machine learning can dramatically improve optimization performance and reduce convergence time.

In this paper, the potential of machine learning techniques for the aerodynamics prediction of an industrial-relevant aircraft configuration has been assessed. Different machine learning algorithms have been evaluated showing that the DecisionTree regression model performs the best in this case. In addition, a deep learning model, a deep neural network, has been also tested and the results were compared to other traditional regression methods. The following pictures show some of the results obtained in the work:

REFERENCES

