



## NEW WENO SCHEMES BY USING TRAINED NEURAL NETWORKS

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### ABSTRACT

Machine learning (ML) is becoming a powerful tool in Computational Fluid Dynamics (CFD) to enhance the accuracy, efficiency, and automation of simulations. Currently, in the design of shock-capturing methods, there is still a heavy reliance on human intuition, particularly in nonlinear components such as smoothness indicators and weighting functions. ML has the potential to reduce this dependence, since by leveraging large datasets, they can learn intricate patterns and make accurate predictions. In this work, based on the work proposed in [1, 2], we present a neural network that compute the weighting functions in the WENO5 scheme. The proposed WENO5-NN scheme generalizes well for different resolutions, and in most of the cases tested, it outperforms the classical WENO5-JS scheme.

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### REFERENCES

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