

Deep Network Multi-Spline Approximation Method

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This paper introduces a new approximation method called Deep Multi Spline (DM-Spline) which is based on a deep learning model and various types of spline functions (B-Spline, UAT-Spline, hyperbolic-Spline, ...). The main idea is to combine different spline functions into a learning model that controls their contribution to the accurate approximation of the function to be built. We introduce a new bridge between Deep Neural Networks (DNNs) and spline approximation methods by developing a detailed theory in each layer and presenting some results on this subject. To test the robustness of the proposed approach, a comparison to state-of-the-art is achieved and shows the efficiency of our model. An application in the medical field is also provided.

Joint work with: Sbibih Driss, Jennane Rachid.

References

- [1] R. Balestriero. A Spline Theory of Deep Networks. *In International Conference on Machine Learning*, PMLR. (pp. 374-383), 2018.