# Kolmogorov equation via deep learning methods

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### Abstract

In this talk we present two results about the Kolmogorov equation using deep learning techniques. Indeed, inspired by [HPW20], we study the application of current techniques of neural networks to the approximation of solutions to the considered PDE in the non-local and the infinite dimensional settings. We remark the importance of the relation between PDEs and stochastic equations to develop the proposed scheme. Since our framework is general, we require the recently developed DeepOnets architectures [LMK21] to describe in detail the approximation procedure, our results strongly rely on the approximation properties of these objects.

# References

[HPW20]  Come Hure, Huyen Pham, and Xavier Warin. Deep backward schemes for high-dimensional nonlinear pde's. *Math. Comp*, 89:1547–1579, 2020.

[LMK21]  Samuel Lanthaler, Siddhartha Mishra, and George Em Karniadakis. Error estimates for deeponets: A deep learning freamwork in infinite dimensions. *preprint arXiv:2102.09618v2*, 2021.