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Deep neural networks: a flexible framework for soil modelling

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Since the first applications of machine learning (ML) methods in the 80s, ML adoption in soil science has increased considerably. In parallel, the size of the soil datasets has also increased. However, current soil modelling is mostly based on “traditional” ML approaches, not taking full advantage of large datasets or the multiple opportunities provided by more advanced modelling methods. Here I present the latest examples in the use of ML for soil predictive modelling, specifically the use of deep learning models in the context of soil spatial modelling and soil spectroscopy. Additionally, I will show less traditional ML applications that allow the use of field data into numerical workflows, and some advanced training techniques that showcase the flexibility of neural networks and open new, exciting opportunities to solve soil modelling challenges.