ALPEN-ADRIA UNIVERSITÄT KLAGENFURT

INVITATION TO THE DOCTORAL SEMINAR

Funny things happening in Neural Galerkin Schemes

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ABSTRACT

Neural Galerkin is a nonlinear counterpart of classical dynamical approximation strategies for time-dependent PDEs. It approximates solutions by neural networks whose weights evolve in time. At first glance, the method is general, elegant, easy to implement, and it indeed has enjoyed notable empirical success. A closer look, however, quickly leads to funny behaviors and troubles: Formulating Neural Galerkin at a proper functional level and connecting it rigorously to practical algorithms raises a number of very subtle challenges. Some stem from sampling issues; others arise from the fact that neural network classes are, mathematically speaking, not particularly well-behaved sets. In this talk, I will illustrate several of these troubles, explain where they come from, and discuss why they are not mere technical nuisances but key conceptual elements to understand when working with neural network approximations.

We hope to see you there!