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NEURAL PDE SOLVERS

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ABSTRACT

The solution of partial differential equations (PDEs) is difficult, having led to a century of research on analytical and numerical methods. The recent towering success of machine learning suggests a new emergent paradigm of neural--numerical hybrid solvers with the ability to quickly generalize over a subset of properties to which a generic solver would be used, including: resolution, topology, geometry, boundary conditions, domain discretization, dimensionality, etc. This holds the promise of reducing computational cost of simulating complex dynamical systems by orders of magnitude, thus creating new exciting opportunities for simulation-based design, uncertainty quantification and optimal control in both academic and industrial settings. This session invites methodological or applied contributions that demonstrate the current state-of-the-art in neural PDE solvers across a range of applications in science and engineering.