

Title: Physics Guided Neural Networks with Knowledge Graph

Author: Kishor Datta Gupta, Sunzida Siddique, Roy George, Marufa Kamal, Rakib Hossain Rifat, Mohd Ariful Haque

Abstract: Over the past few decades, machine learning (ML) has demonstrated significant advancements in all areas of human existence. Machine learning and deep learning models rely heavily on data. Typically, basic machine learning (ML) and deep learning (DL) models receive input data and its matching output. Within the model, these models generate rules. In a physics-guided model, input and output rules are provided to optimize the model's learning, hence enhancing the model's loss optimization. The concept of the physics-guided neural network (PGNN) is becoming increasingly popular among researchers and industry professionals. It has been applied in numerous fields such as healthcare, medicine, environmental science, and control systems. This review was conducted using four specific research questions. We obtained papers from six different sources and reviewed a total of 81 papers, based on the selected keywords. In addition, we have specifically addressed the difficulties and potential advantages of the PGNN. Our intention is for this review to provide guidance for aspiring researchers seeking to obtain a deeper understanding of the PGNN.

Keywords: Physics-guided neural network (PGNN); Machine learning (ML); Deep learning (DL); Data-driven models; Loss optimization.

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