Exploration of Non-Convex Optimization Challenges Across Diverse Data Sets Using Machine Learning and Deep Learning Methods

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dc.description.abstract	In the modern era, experimenting with datasets to derive predictive insights has become both commonplace and highly effective. The success of experiments in machine learning and deep learning hinges on the availability of diverse datasets, which are important for achieving accurate outcomes across a spectrum of domains. Notably, primary datasets such as time series data often yield particularly efficient results. However, within this framework, the existence of NP-hard problems can present a significant challenge, potentially resulting in non-convex outputs. Addressing this challenge necessitates the transformation of NP-hard problems into P problems to optimize the outcomes. In instances where machine learning or deep learning analyses yield non-convex results, non-convex optimization methodologies come into play. These methodologies are designed to identify the global minimum amidst multiple local minima. This paper draws attention to datasets where suboptimal outcomes persist, underscoring the difficulty in achieving the global minimum in many scenarios. Furthermore, it provides insights into the prevalence of non-convex optimization challenges within these datasets, proposing avenues for future research aimed at making them more amenable to convex optimization techniques. By addressing these challenges, the field can enhance the efficiency and accuracy of predictive analytics, driving advancements in machine learning and deep learning applications.	en_US
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