Deep learning used in optimization problems

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Abstract: Optimization problems in engineering often find the minimum or maximum value of the objective function under a prescribed set of constraints. Gradient-based algorithms restrict to apply derivative and partial derivative for some cases, while in other case derivative-free algorithms are used but they have a slow speed of convergence. This paper presents a capable deep learning to approximate the cost and constraints function for solving convex optimization. The analysis phase and the first order partial derivative predicted from a machine learning model so that the solution optimization can be calculated. A few examples illustrate to evaluate the performance of the model.

Keywords: Deep learning, optimization problems, approximate function, convex optimization