Abstract

Speeding up Inference in Machine Learning Algorithms using Hadamard Matrices

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Machine learning algorithms for classification tasks have a variety of use cases and applications. One model type, the artificial neural network, has become increasingly popularized over the last decades, with fascinating applications in computer vision and elsewhere. Such classifier algorithms have a number of parameters and yield a per-class value. In this work, we discuss the use of a Hadamard matrix to initialize the classifier, which in turn speeds up inference. The aforementioned matrix is position at the final classification transform, which yields two primary benefits. Firstly, it is a deterministic, low-memory, and easily generated matrix that can be used classify. Secondly, it is removes the need to perform matrix-matrix multiplication. By speeding up performance, we can enable further state-of-the-art results on many tasks that have immense applicability in the real world.