

A GREEN AI OPTIMISATION FRAMEWORK FOR ENERGY-EFFICIENT DEEP LEARNING SYSTEMS

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Deep learning systems are becoming larger and more complex. Due to this fact, they consume additional processing capability and consequently power and carbon emission. The primary aim of most energy is not of much concern to artificial intelligence studies, and the aim is to make it more accurate, efficiency and environmental issues. The proposed AI in this paper is the Green AI Optimisation framework (GAIOF) to reduce the consumption of energy without affecting the quality of the 5 models. The optimisation methods employed in the framework are structured pruning, 8-bit quantisation, knowledge distillation and energy-aware benchmarking. Another new metric, the Green AI Performance Index (GAPI), is the composite measure of accuracy, energy consumption, FLOPs, and carbon emissions of models. We applied the framework to CIFAR-10, Image Net and GLUE. The findings demonstrate that GAIOF consumes less energy, and the accuracy is similar to the baseline model. This is a model that allows sustainable and green AI development.
