

Thesis: Tiny Square Artificial Intelligence

Abstract: Deep learning (DL) has recently changed the development of intelligent systems and is widely adopted in many real-life applications. Despite their various benefits and potential, there is a high demand for DL processing in different computationally limited and energy-constrained devices. It is natural to study game-changing technologies to increase deep learning capabilities. Recently remarkable progress has been made in DL since they can be implemented and embedded on tiny restricted devices and save a significant amount of storage, computation cost, and energy consumption. However, some problems such as tiny neural networks for object detection and training time reduction are still unsolved. Our contributions (in our completed work and proposed ongoing work) to address these problems are the following: (1) Tiny Neural Network compression and speed-up: We are applying for Binary Neural Network and fast Fourier transform to further compress the model's weight and speed-up model's inference time. (2) Tiny Neural Network training time speed-up: we are developing a few-shot approach to speed-up training time for tiny neural network. (3) Tiny Device Benchmark: we are using tiny devices such as raspberry pi to test our methods and prove our contributions.

Committee:

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