

1. Performance analysis of VGG-Net: VGG-net replaced the higher convolution such as 5x5 convolution by 2 consecutive 3x3 convolution operation so now perform a detail analysis of VGG-Net in terms of computational cost and memory bandwidth. Try to use network in network to optimize VGG-Net.
2. Implement VGG-Net with and without regularization, choose an appropriate threshold value. Assign value zero to all the parameter having value below chosen threshold value and perform memory analysis if we store only non-zero parameters only. Suggest and analyse a method to store non-zero parameters only.
3. Deep learning with limited numerical analysis. Show algorithms to perform Multiply and Accumulate (MAC) operation using floating point representation and fixed point representation. Design and analysis technique to store parameter as fixed point representation.
4. Learning number of neuron in deep learning. Here we are designing a technique to remove the nodes along with all incoming and outgoing edges of nodes in the deep neural network. Analyse the computational and memory benefit on existing system with currently available software library.
5. Channel pruning for accelerating very deep neural network. As depth of deep network increase number of channel increase and which effects the computational and memory cost of the deep network. Channel pruning reduce the number of channel in each layer and thus reduce computational cost. Perform analysis of given methods in detail.
6. Do detail analysis of memory bandwidth and computational requirement of Alexnet, VGG-Net, GoogLeNet, and Resnet for inference.
7. Pruning Filters for efficient convolution. We present an acceleration method for CNNs, where we prune filters from CNNs that are identified as having a small effect on the output accuracy. By removing whole filters in the network together with their connecting feature maps, the computation costs are reduced significantly. Perform computational analysis on filter pruning.

Those who interested to take these projects as the part of Software Engineering Mini project; please contact

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