Searching optimal stage-lengths for DNNs

In Neural Architecture Search (NAS), typically a repeatable building block („cell“) is searched and later evaluated by stacking it in the final network.

Ironically, despite the cell being searched, the design of the final network is not considered. Most methods stack an equal number of cells per stage (a stage are all cells that operate on tensors of the same h/w resolution, we have e.g. 6 cells per 3 stages), however stages of different lengths may be better in terms of accuracy, FLOPs, or latency.

The goal of this thesis is to efficiently discover optimal stage lengths for a given cell, target (accuracy/FLOPS/…), budget (time / number of cells / …) and dataset.

On the images you can see that the DARTS results are on the pareto front (accuracy/FLOPs) of all networks that use exactly 18 cells for CIFAR-10, but not CIFAR-100.

Requirements:

• A good grade in any DNN course
• Experience with TensorFlow or PyTorch

This thesis can be done in English or German.

Kontakt

Kevin A. Laube
Sand 1, Raum A311
kevin.laube@uni-tuebingen.de

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