Review of Literature on Growing Neural Networks

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1 Introduction

This article aims to summarize the existing literature concerned with growing artificial neural networks. For each paper it will list the most significant contribution. The following four questions will guide the summary of each paper:

1. Why are models grown? What is the goal or metric the approach is evaluated on?
2. When are the models grown?
3. Where are the models grown?
4. How are the the new parts initialized?

Each paper tries to make progress in answering at least one of the questions. Hence, they can be used to categorize these papers.

2 CompNet: Neural Networks Growing via the Compact Network Morphism (Lu, Ma, and Faltings 2018)

coming soon

3 NeST: A Neural Network Synthesis Tool Based on a Grow-and-Prune Paradigm (Dai, Yin, and Jha 2018)

coming soon

4 AutoGrow: Automatic Layer Growing in Deep Convolutional Networks (Wen et al. 2020)

coming soon

5 GradMax: Growing Neural Networks Using Gradient Information (Evci et al. 2022)

coming soon

References

Dai, Xiaoliang, Hongxu Yin, and Niraj K. Jha (June 2018). "NeST: A Neural Network Synthesis Tool Based on a Grow-and-Prune Paradigm". In: arXiv:1711.02017. DOI: 10.48550/arXiv.1711.02017. arXiv: 1711.02017 [cs]. URL: http://arxiv.org/abs/1711.02017 (visited on 10/17/2022).

Evci, Utku et al. (June 2022). *GradMax: Growing Neural Networks Using Gradient Information*. arXiv: 2201.05125 [cs]. URL: http://arxiv.org/abs/2201.05125 (visited on 10/17/2022).

Lu, Jun, Wei Ma, and Boi Faltings (Apr. 2018). *CompNet: Neural Networks Growing via the Compact Network Morphism*. DOI: 10.48550/arXiv.1804.10316. arXiv: 1804.10316 [cs]. URL: http://arxiv.org/abs/1804.10316 (visited on 10/17/2022).

Wen, Wei et al. (June 2020). *AutoGrow: Automatic Layer Growing in Deep Convolutional Networks*. DOI: 10.48550/arXiv.1906.02909. arXiv: 1906.02909 [cs, stat]. URL: http://arxiv.org/abs/1906.02909 (visited on 10/17/2022).