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Deep Learning Short Story Proposal

**Meta Learning: Learning to Learn in Neural Network**

This paper looks at various learning techniques, particularly meta-learning, and their evolution over the years in the context of neural networks. Whereas conventional approaches in AI tend to stick to one learning algorithm, the meta-learning attempts to improve the learning algorithm itself. Meta learning allows being aware of and taking control of one’s own learning. This kind of learning solves the challenges of deep learning such as data and computation bottlenecks as well as fundamental issue of generalization.

For conventional machine learning algorithms, the performance of model depends on hand crafted feature extraction. On the other hand, Deep learning provides a way to consider both feature and model learning which greatly improves the performance . Meta-learning in neural network takes it to the next level by integrating joint feature, model, and algorithm learning.

The survey paper (<https://arxiv.org/pdf/2004.05439.pdf>) describes the basics of meta learning and its relationship with other related fields – transfer learning, multi-task learning and hyperparameter optimization.

This paper provides the latest and greatest survey of the rapidly growing area of neural network meta-learning. It showcases the taxonomy of meta-learning landscape by classifying techniques as meta-optimizer, meta-representation, meta-objective, and applications.

Popular meta-learning techniques include few-shot learning, reinforcement learning and architecture search.

Finally, there is a discussion for unsolved problems in the space of meta-learning and scope for future research.