Towards GAS?

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Abstract

The author asks whether "Deep Learning" is really such a good idea.

Could other statistical methods do better than networks?

For instance, why not look at other Generative Adversarial Statistics?

On a statistical point of view, neural networks are a method used to perform regressions. For instance, one may want to compute a clustering, or to estimate a density: both are regression tasks.

In fact, neural networks approximate a target using a sieve, *i.e.* a class of functions. With a ReLU activation, the sieve is a complex class of piecewise affine functions (broken lines). The deeper the network, the less probable identifiability is.

The training phase of a network is usually expensive, sometimes prohibitively so.

Other statistical methods may indeed be more efficient to perform this regression task!

Consider for instance GANs. Is their efficiency really due to the "Network" part? Other GAS (Generative Adversarial Statistics) might end up being more affordable.

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