---------- Forwarded messag= ----------
From: Joscha Bach ◄███████████████████████████>
Date: Wed, Oct 11, 2017 at 7:55 PM
Subject: Re:
=o: Jeffrey Epstein <jeevacatio=@gmail.com <mailto:jeevacation@gmail.com> >

After skimming their paper, the idea seemed =nexciting to me at first: basically, if we have enough feature dimensions =e can almost always find a linear separation. This is also related to how =upport Vector Machines work: they project the data into an extremely high-=imensional space, find a separating hyperplane with linear regression, and=then project that plane back into the original space as the separator. A s=milar idea is behind Echo State networks, which use a randomly wired recur=ent neural network and then only train the output layer with a single line=r regression.
The authors take an existing trained neural network, and whenever it makes = mistake, they train a linear classifier on the network state and data, i.=. they try to find out when the network goes wrong. Instead of improving t=e network (which is also likely to make it worse in other cases), they add=an additional layer to it. For engineering, this makes a lot of sense, bec=use large neural networks are cheap to use and deploy but expensive to tra=n.

On a more philosophical level, it is tempting to ask if that might be a gen=ral learning principle for brains: when you don't perform well, add mo=e control structure on top. It probably makes sense whenever you are confi=ent that training the existing structure won't improve it that much, b=t unless training the weights in an existing network, it also adds quite a=few milliseconds to the processing time. There is probably an optimal trad=off for this. The other thing is that the new layer is a linear classifier=only (at least in this paper), and it is creating a local override on the =ystem's results, instead of integrating with it, somewhat similar to h=w reasoning might override our subconscious behavior. One of the drawbacks=is that this won't allow us to use the new layer for simulating/unders=anding the structure of the domain modeled by the rest of the network.

– Joscha

> On Oct 10, 2017, at 09:43, jeffrey E. <jeevacation@gmail.com <mailto:jeevacatio=@gmail.com> > wrote:
>
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