Product-Convolution Network

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The equations for a neural network are essentially for an input vector :

This is for a matrix of weights and a vector of biases. The Matrix operation contains a sum over the number of descriptors. If instead the descriptors were functions , in the range we might have steps like:

For we have

We can use the Mellin transform to write that

And in turn

The trick is to assume that all functions can be represented in terms of hypergeometric functions

Then

And we can write

Now we assume all the free parameters to fit to the data are contained within the terms. If each is of the form Hypergeometric2F1, Then we have

For ease of convergence we can force the argument of to be in the range [-1,1], which fits with the sigmoid definition

It is in our interest to develop a transform such that if

In analogue to the Ramanujan Master Theorem