# Thoughts on Deep Learning

A Marketing Masterstroke

A Scientific Debacle

Active Structure

# Origin

The term was invented to describe a method for winning chess games, where the optimum next move for any point in any game was calculated by playing out millions of games.

The technique was effective, in that any person could be beaten by it.

# So What Is the Downside?

The method cannot tolerate even the slightest change in the rules, or the millions of games have to be rerun.

Changes like:

A horse can’t immediately retreat to the square it just came from.

(this would also require more state information to be carried, changing the training algorithm)

A bishop can ricochet off the sides of the board.

# What About Motive?

We would prefer it didn't thrash children or new players.

"Assess the level of the opponent's skill, and if low, play to an entertaining draw or lose gracefully."

The method has no understanding of the game, the opponent or anything else – it only knows the optimum next move for a given position of the pieces.

A better description would be "Shallow Learning"

# Can the Method Be Used With Text?

Chess is a shallow game, constrained to be within the limits of what one can hold in their head – no need to write anything down to keep track, a glance at the board tells you everything you need to know.

Text is an altogether different beast. It is written down for a reason.

# What Does Deep Learning Do With Text?

With Chess, Deep Learning found the optimum move for every possible current position.

Text is vastly larger – in a few words, you can say something that has never been said before in the history of the world. And there is no playing out to a small set of conclusions, as there is in Chess.

What Deep Learning does is acquire statistics for a word following another word. It can then use those statistics to construct plausible sentences.

# Some Problems

Words propagate effects well past their neighbours.

A simple example: “Used To”

He is used to the heat.

He is used to being the underdog.

He used to come here often.

The rake used to aerate the soil was stolen.

The passive verb implies “The rake that was used to …”, which is a literal use of “used to”. Statistics between near neighbours throws away much of the sense of text. That doesn’t matter if you are not interested in sense.

# Complex Text

We use complex text for a reason – people can't hold all the concepts in their head, but by reading it slowly they can understand the throughline.

Complex text can refer twenty pages back, or five hundred pages forward, it can define terms. It can deal with complex objects.

OK, so legal text is boring. Complex specifications can create complex technology, which improves our lives. Our lives are also governed by legal text, so perhaps we should understand them as well

# Is Deep Learning the Way to Go?

That depends on where we want to go.

If we are happy with plausible text that by definition will never carry a new insight, then maybe.

Would we teach children this way – “We won’t tell you about nouns and verbs and those horrible things, gerunds – no, read every book in the library without any initial knowledge and we will consider you literate”. Don’t think so.

# Why a Scientific Debacle?

We have had multiple waves of failures of AI – each time seeking a method which didn’t require us to think. All we needed to do was turn a handle and the problem was solved.

Deep Learning is the latest, with tens of thousands of people dedicating their lives to make it a success.

# What We Need

Behind the cherubic faces lies a powerful abstractor, analyser, synthesiser – the Unconscious Mind. It will be hard work to create an artificial one – we will have to really think about it. Short cuts just won't do.