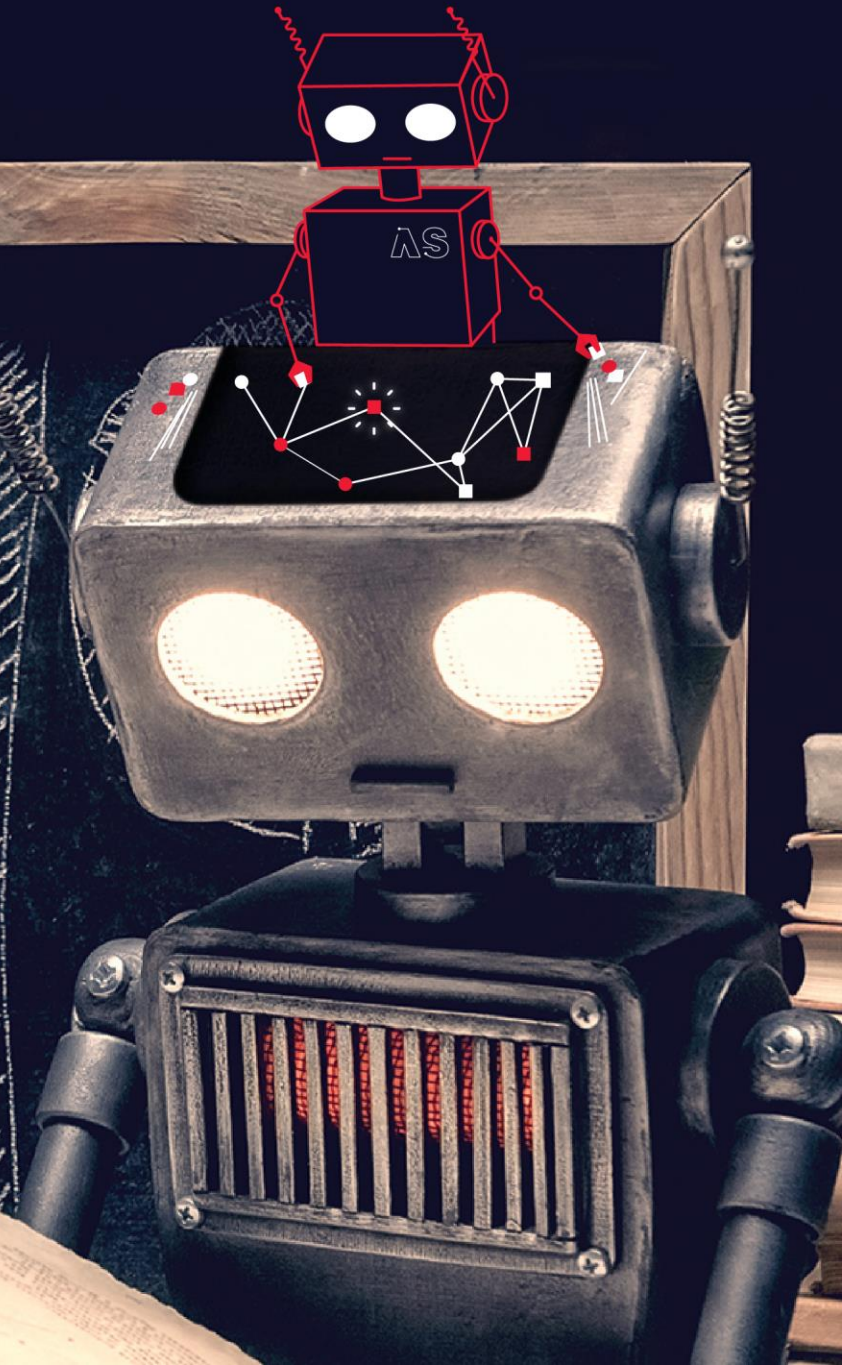


What Do We Do.



Interactive
Engineering

20.02.20



Where we are coming from?

In 2014, we built a semantic system to read US Health Insurer policies, answer member questions – the industry fields about a billion calls a year. Each insurer has thousands of policies, even down to the county level.

Our technology beat out about 15 other companies, ensuring our licensee got a multi-million dollar contract from one of the largest US Health Insurers.

We built that system by hand. Not doing that again – **let's do something that is self-extensible.**

So what's the problem?

You can make a semantic system work, while largely ignoring the multiple meanings of many words, if you stick to a narrow but valuable domain, like US Health Insurance.

Even for medicine, it doesn't work very well –

Cervical vertebra – in the neck

Cervical cancer – cancer of the cervix

The setting of broken bones in an outpatient setting

Combine several fields, and the reliability is terrible. The word “set” has 74 different meanings!

What's the solution?

If you want to make a semantic system more general (and potentially more profitable), you have to start worrying about what words mean in different areas.

You might want to combine

Medicine and the Law

Epidemiology and Economics – hot topic

Global Warming and Economics

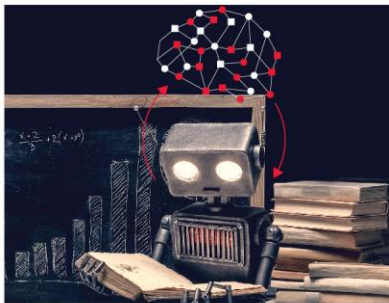
A totally new environment - Mars

Anything (Your business) with Anything Else

This opens up a real Pandora's Box, and forces emulation of the abilities of the Unconscious Mind.

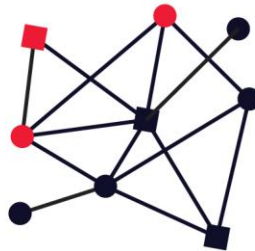
Automatic extension

The system doesn't know a word – let it use a dictionary. OK, a few problems – only human-readable dictionaries are available. The dictionary staff become part of the machine's resources. A bigger problem – people who write dictionaries have no idea what the person does when they read an entry – **we have to fill that gap, using an understanding of the Unconscious Mind.**



← Merge

Review →



← Updates



Dictionaries/Wikipedia

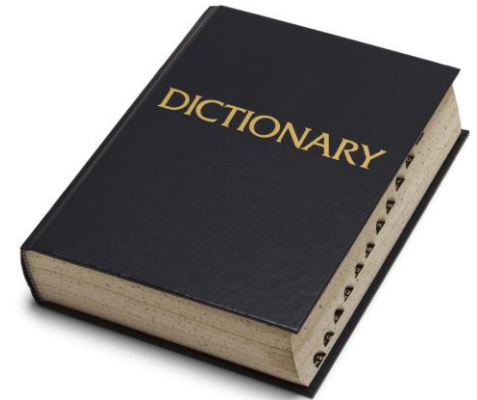
When we talk about a dictionary, we don't mean a dog-eared book that is out of date.

We mean an internet interface to a continually updated database of the meanings of 800,000 words and concepts – “social distancing”.

The machine finds a word it doesn't know – it looks it up, gets a file of all the meanings of the word, builds them into its internal structure, continues.

At the same time, the machine gets regular updates on its existing vocabulary – new words, new meanings for existing words. In response, it changes its internal structure – its understanding of the world.

The machine has to do a lot of work “cleaning up” the entries, making them suitable for a machine level of accuracy



What's an example?

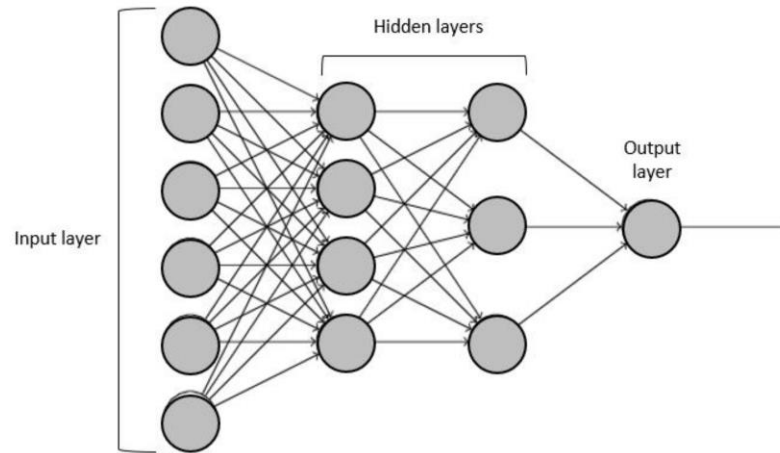
The road has two sets of lane markings – a sign tells you which one to use.

The unconscious mind reads the sign, takes the instruction and modifies your lane following software with a temporary hack, with the conscious you not having a clue where it is or how it works.

We need to emulate that ability – the ability to read stuff and immediately change the system internally.



Why not an Artificial Neural Network?

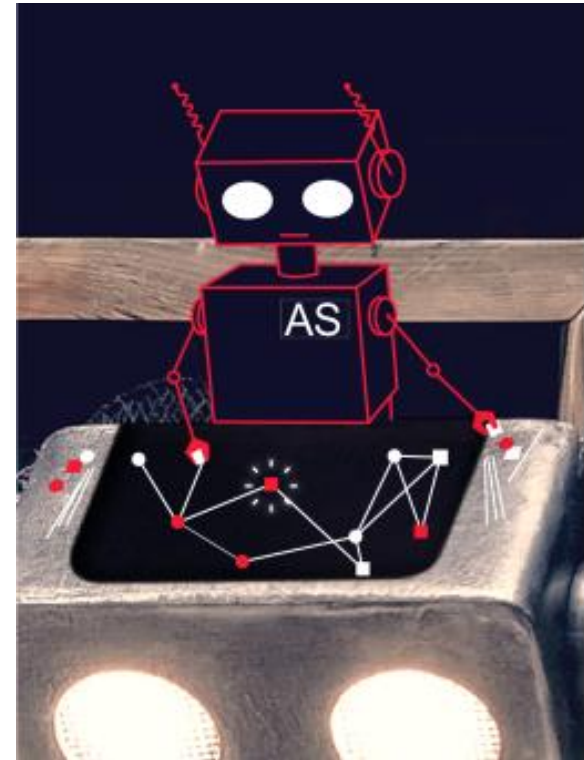


An Artificial Neural Network is static, it is directed, and it runs on statistics buried somewhere in the network – it is completely at odds with an Unconscious Mind approach, where the structure needs to be active, undirected and its workings identifiable, so the Unconscious Mind can change them, and preferably it has realtime situational analysis, so it is continually assessing the fit of the solution with the problem

Artificial unconscious

We don't need AI techniques that are incredibly brittle and don't fit together – **we need an artificial unconscious, which can modify any part of the system under its control.**

Some rules – everything needs to be controllable through a textual interface. That means all the current AI technologies aren't going to be of any use.



But, but

**Chess playing programs
can beat anybody
– shouldn't we be using
that technology?**



OK, let's have a tournament. A human and a program turn up, we slightly change the rules and they start playing. But, but – you can't do that, it was programmed for a specific set of rules.

It is called reality – the rules are always changing under your feet. Get used to it – don't use brittle solutions that aren't modifiable through words. The rules of Chess were last changed 250 years ago – what business can say that?

An ingenious approach but useless in the real world.

Two plus two

One more thing – can these AI methods add two numbers together?

Not the way they work – they use statistics or scenarios. We don't have to go to Mars to find a new and dangerous environment with no statistics – it's right here right now thanks to Climate Change, or Covid 19, or anything that is “unprecedented”, like bushfires.

Building “intelligent” systems without any analytic ability is not very intelligent. We can't wait to gather statistics until after the event – we might all be dead. Jumping off a tall building springs to mind – the statistics are great until the ground floor



The Unconscious Mind can be your worst enemy

Whether standing on Mars, or doling out pills in a hospital dispensary, both can be deadly if you are bored, distracted, tired or just lazy. You revert to unthinking behaviour, and you are dead in seconds on Mars, or that nice Mrs Brown in Ward 7 dies from the wrong dose (160,000 unnecessary deaths a year in the USA).

Solution – have a machine that can both read and run situational analysis – it tugs at your sleeve before you make the mistake.



Interactive Engineering

What Do We Do?



alamy stock photo

HMEKAA
www.alamy.com

What's the competition

People are.

Fortunately, humans aren't very good at complex problems – they have a limit of four pieces of information in play - so there will be plenty for the machines to do.

Humans also don't like tedium – like wading through a million hits from Google.



“

PEOPLE
ARE OUR
BIGGEST
COMPETITOR

What's an application?

Google hasn't changed their search methods in twenty years – it would be good to describe what you are looking for, and send it off to find what you want in a morass of irrelevant hits.

That means an active piece of structure, turning itself around as it compares itself with a piece of text, looking up a word it doesn't know, not the excruciating dumbness of keyword searching.



GOOGLE
HASN'T
CHANGED
THEIR SEARCH
METHODS
IN TWENTY
YEARS

About 9,320,000 results (0.38 seconds)

Why hasn't someone done this already?

People do what they know – they follow the latest craze, like the rest of us.

- Expert Systems
- Neural Networks
- Intelligent Agents
- Machine Learning
- Deep Learning

The marketing guys are expert at coming up with names that promise a lot and deliver very little.

Why so little? – static structure from static thinking, or the laziness of statistics or key words.

The unconscious mind and its abilities provide a far better guide, but a far higher mountain to climb.

How big is the market?

You would laugh if a number was put on it.

How long is a piece of string – this thing will go everywhere, because the wet version is everywhere now, and badly needs help as the society increases its velocity and complexity.

The applications are limitless.



THIS THING WILL GO EVERYWHERE, BECAUSE THE WET VERSION IS EVERYWHERE NOW, AND BADLY NEEDS HELP

What's the money for?

We expect to be signing licensees in 12-18 months time – we will need people to support those licensees.

We will need to find people who have the capability to have some insight into their unconscious mind – which means they will be rare and expensive, and almost certainly won't come from computing, so a lot of training will be needed.

We will need to break them of their bad habits – their static and directed thinking, which they were trained to do.

We will get failures – let's say we spend \$5 million and we might get three. One to replace the founder, two to support licensees.

How confident are we?

We have been working on laying the foundation for forty years – why do we think we are anywhere close?

Because we say we are. Getting the machine to clean up its own word definitions will be the basis for many simple but worthwhile applications.

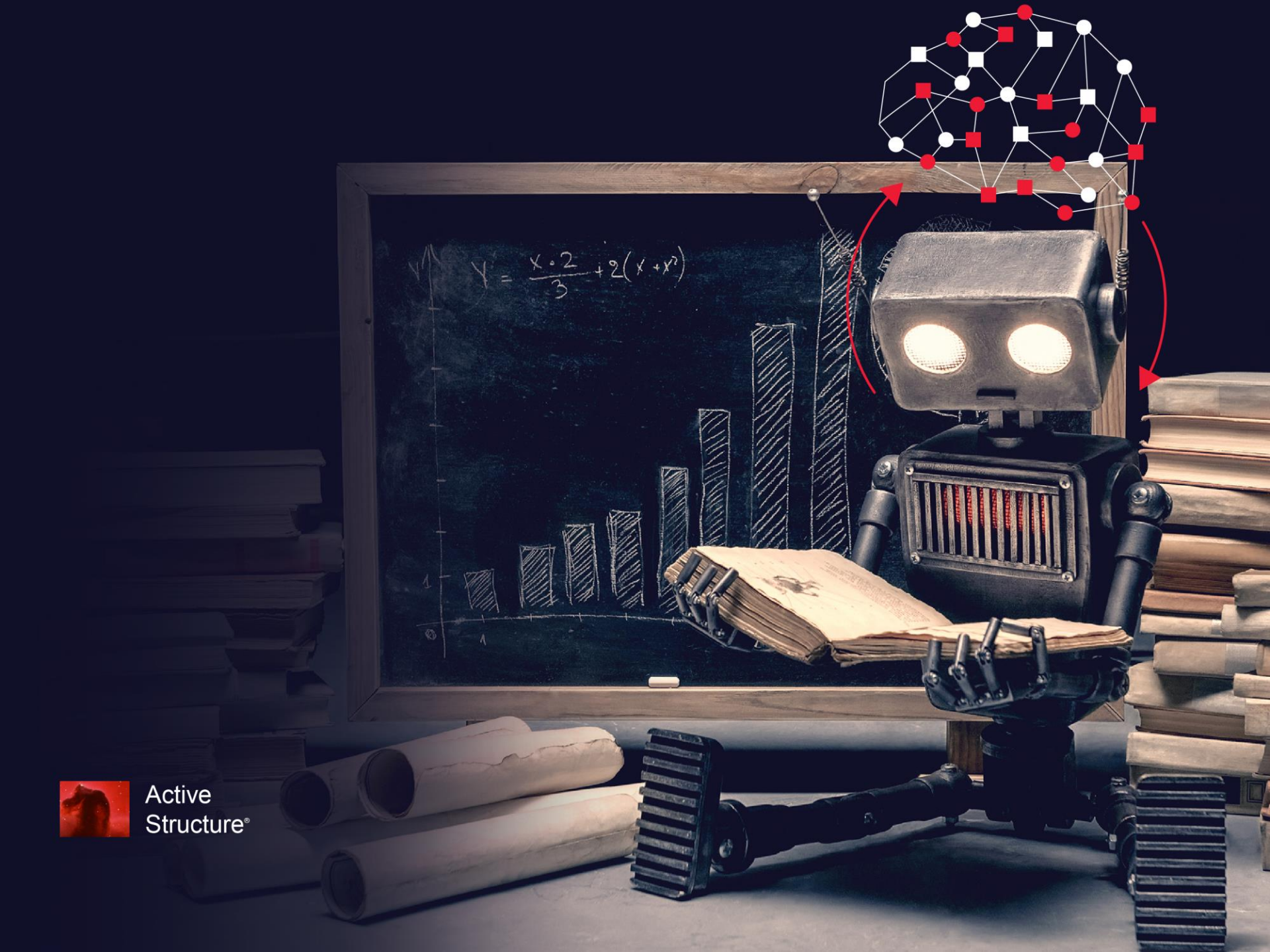
Finding the right people – not so confident - there may not be five people in Australia with the right abilities and mindset – we are talking outer limits here.

Why is this different?

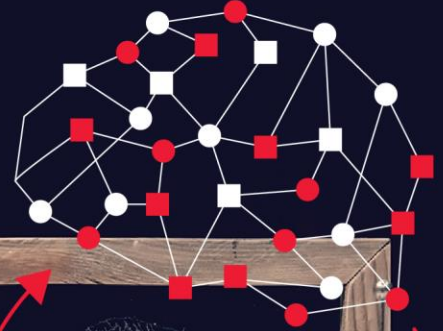


Active Structure

Because of all the things it is not – not static, not directed, not unidentifiable
Instead, it is self-extensible



$$y = \frac{x \cdot 2}{3} + 2(x + x^2)$$



Active
Structure®

Problems using a video

We are talking about the unconscious mind – something you can't see, but you also can't see what it does. It has to handle everything for you – your conscious mind would be instantly overwhelmed by detail. Very hard to show anything useful visually.

The lane-marking example is good, but people won't understand the complexity of what happens – they do more complex things every day without being aware of them, like assimilating a flood of new concepts.

We have to put that capability in a machine. It is not impossible, but it is hard. Telling people about it is even harder – *Interactive Engineering*