D O W N T H E R A B B I T H O L E | B Y N E V I L L E C R A W L E Y

AI and Video Games (again), Tricky Chatbots and Your High Dimensional Brain

AI and video games (again)

Vicarious (a buzzy Silicon Valley company developing AI for robots) say they have a new and crazy-good AI technique called **Schema Networks**. The Allen Institute for Artificial Intelligence and others seem pretty skeptical and demand a throw-down challenge with AlphaGo (or, failing that, some peer-reviewed papers with commonly used terms and a broader set of tests).

In other AI video game news, Microsoft released a **video** of their AI winning at Ms. Pacman, with an instructive voiceover of how the system works.

Tricky chatbots

I recently stumbled upon Carl Icahn's **Twitter feed** which has the tag line: *"Some people get rich studying artificial intelligence. Me, I make money studying natural stupidity."* Me, I think in 2017 this dichotomy is starting to sound pretty quaint. See: Overview of recent FAIR (Facebook Artificial Intelligence Research division) **study** teaching chatbots how to negotiate, including the bots self-discovery of the strategy of pretending to care about an item to which they actually give little or no value, just so they can later give up that item to seem to have made a compromise. Apparently, while they were at it, the Facebook bots also unexpectedly **created their own language**.

The quantum age has officially arrived

I've been jabbering on and pointing to links about quantum computing and the types of intractable problems it can solve for some time **here**, **here** and **here**, but now Bloomberg has written a long

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piece on quantum we can officially declare "The quantum age has officially arrived, hurrah!". Very good overview piece on quantum computing from Bloomberg Markets **here**.

Your high dimensional brain

We tend to view ourselves (our 'selfs') through the lens of the technology of the day: in the Victorian 'Mechanical age' we were (and partly are) bellows and pumps, and now we are, by mass imagination, a collection of algorithms and processors, and possibly living in a VR simulation. While this 'Silicon Age' view is probably not entirely inaccurate it is also, probably, in the grand scheme of things, nearly as naive and incomplete as the Victorian view was. Blowing up some of the reductions of current models, this new (very interesting, pretty dense, somewhat contested) **paper** points towards brain structure in 11 dimensions. Shorter and easier explainer **here** by Wired or even more concisely by the **NY Post**: *"If the brain is actually working in 11 dimensions, looking at a 3D functional MRI and saying that it explains brain activity would be like looking at the shadow of a head of a pin and saying that it explains the entire universe, plus a multitude of other dimensions."*

And in other interesting-brain-related news:

- IEE pulled together a **bunch of great pieces** on the brain and technology, including **"What Intelligent Machines Need to Learn From the Neocortex".**
- An **Allen Institute** scientist claims to have found the seat of consciousness by using a revolutionary 3D mapping technique.
- UCLA **study** shows our brain is 10 times more active (and may have more than 100 times the computational capacity) than previously thought
- Research using current brain scan technology **differentiate two types of empathy.**
- Researchers decipher how **faces are encoded in the brain**: only 205 neurons required per face; findings also have artificial intelligence applications.
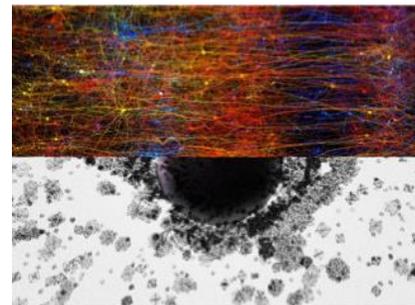
Taming the "Black Dog"

And finally, three different but complimentary technology-enabled approaches to diagnosing and fighting depression:

- A **basic algorithm with limited data** has shown to be 80-90 percent accurate when predicting whether someone will attempt suicide within the next two years, and 92 percent accurate in predicting whether someone will attempt suicide within the next week.
- In a different predictive approach, **researchers** fed facial images of three groups of people (those with suicidal ideation, depressed patients, and a medical control group) into a machine-learning algorithm that looked for correlations between different gestures. The results: individuals displaying a non-Duchenne smile (which doesn't involve the eyes in the smile) were far more likely to possess suicidal ideation.

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- On the treatment-side, researchers have developed a potentially **revolutionary treatment** that pulses magnetic waves into the brain, treating depression by changing neurological structures, not its chemical balance.

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