

Re: The Future

There's a question of cost-effectiveness, though. It's one thing to merely *have* the technology to take random matter (crumpled up newspapers, banana peels, etc.) and convert it into something useful (e.g. a dish of fettucini alfredo). It's an entirely different thing to have this technology available in a form which costs less than a couple billion dollars per invocation.

Eventually we could choose to replace our biological bodies with "better" engineered bodies and even before that it can be used to further expand our life spans. These technologies will interact with each other synergistically. Technology to enable reverse engineering of the brain is also expanding at an exponential rate.

You might be interested in reading Roger Penrose's "The Emperor's New Mind". In it, Penrose convincingly argues that there's "something going on" in the human brain which current physical theories cannot explain. He suspects we'll need to develop a unifying theory for quantum-gravity before we can make further progress in understanding how the mind works. Penrose has written other books since then — I believe one of them is called "Shadows of the Mind" — but I haven't read them yet, so I'm not sure if Penrose has since updated his analysis.

Either way, reverse engineering the brain might not be as simple as sending in nanobots and having them report what they "see". After all, nanobots, by definition, tend to be at the nanometer scale (10^{-9} meters), whereas I'm guessing a lot of quantum phenomenon happen at the plank scale (10^{-35} meters). Beyond nanotech, there's picotech, femtotech, attotech, zeptotech and yoctotech, the last of which only reaches 10^{-24} meter scale. If we're going to go this route, we've still got a long way to go.

Personally, I think current research in neural networks is relatively promising. Current estimates put the number of neurons in a human brain at 100 billion. There's currently a CPU with 1024 cores (http://www.technologyreview.com/read_article.aspx?id=17076&ch=infotech). Once we get a CPU with a billion cores (around 40 years, if we assume a doubling of core every 18 months), we might start to see something interesting.

Nanotechnology will greatly speed this up also. This will lead to machine intelligence on computers that are a million times faster at processing than our brains.

Note that, depending on your metric, computers may already be a million times faster at processing than our brains. For one example metric, communication from one neuron to the next happens using a combination of chemical and electrical reactions which is exceedingly slow

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compared to the switching speed of a transistor in a CPU chip. Advocates of Strong AI (Penrose is not one of them) believe the only thing stopping computers from being able to "think like a human" is the relatively linear nature of CPU design, contrasted against the massively parallel architecture of the human brain.

[...]

He posulates having interchangeable reality and virtual reality and even having them both at the same time.

Something like http://en.wikipedia.org/wiki/Computer_mediated_reality
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I'm fond of the idea that people will be able to one day directly "perceive" the Internet as a sixth sense, via http://en.wikipedia.org/wiki/Brain_plasticity. Extracting information from packets using your WiFi connection would be as natural as extracting information from photons using your eye. This will open up new forms of artful expression, and a new medium that is not based in sight, sound, touch, taste or smell. Perhaps you could directly send states of mind, perspectives or emotions for others to experience.

– Oliver

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