Nowhere Man Please Listen

Quinnipiac University

Hamden, CT USA

The Automatic Confession Machine:
A Catholic Turing Test

But what if God himself can be simulated, that is to say, reduced to the signs which attest to his existence?

Jean Baudrillard
Simulations 1983

The human speaker will, contribute much to clothe ELIZA's responses in vestments of plausibility.

Joseph Weizenbaum
Discussing ELIZA in 1966
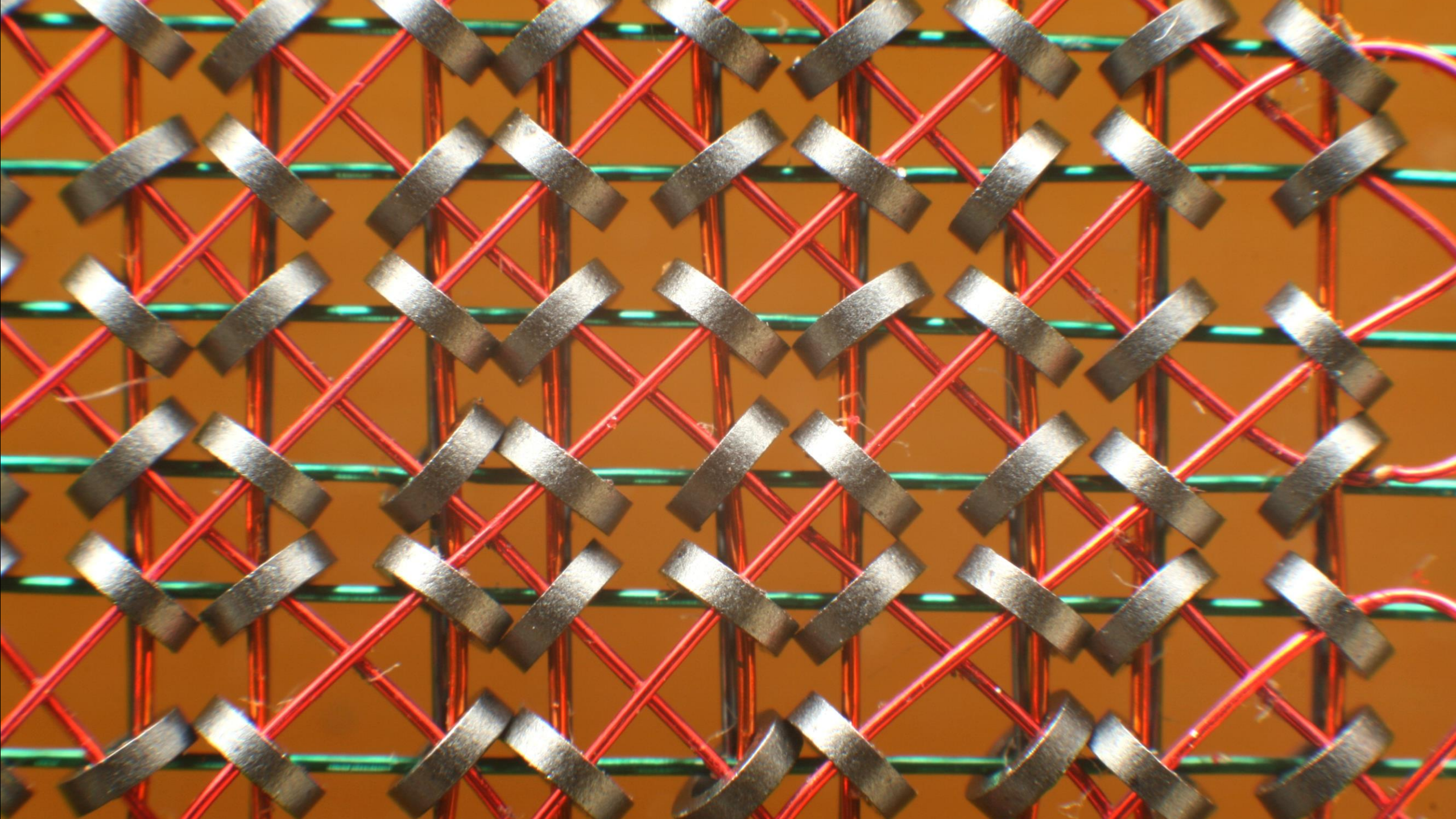
When Singularity arrives…

The Monadology
Gottfried Wilhelm Leibniz

In a confused way they all strive after [vont a] the infinite, the whole; but they are limited and differentiated through the degrees of their distinct perceptions.

The First Programmer
Ada Lovelace

… predicted that Babbage's Analytical Engine " might act upon other things besides number…".

Extended Mind

Where does the mind stop and the rest of the world begin? The question invites two standard replies. Some accept the demarcations of skin and skull, and say that what is outside the body is outside the mind. Others are impressed by arguments suggesting that the meaning of our words "just ain't in the head", and hold that this externalism about meaning carries over into an externalism about mind. We propose to pursue a third position. We advocate a very different sort of externalism: an *active externalism*, based on the active role of the environment in driving cognitive processes.

Extended Mind and the Self

What, finally, of the self? Does the extended mind imply an extended self? It seems so. Most of us already accept that the self outstrips the boundaries of consciousness; my dispositional beliefs, for example, constitute in some deep sense part of who I am. If so, then these boundaries may also fall beyond the skin.

"Now we can say what a computer program is: a symbol manipulating algorithm."

Colin McGinn

"…we must see consciousness as consisting of a series of information processes, and the standard apparatus that we have for accounting for information process in terms of symbol manipulation by a computing device must form the basis of any scientific account of consciousness."

- John Searle

From Calculation to Computation to?

Independent of Substrates

- Jacquard Loom
- Tube transitors
- Punched Cards
- Silicon
- DNA Computation?
- Quantum Computers?
- Meat Machines?

Moore's Law
The Fifth Paradigm

Logarithmic Plot
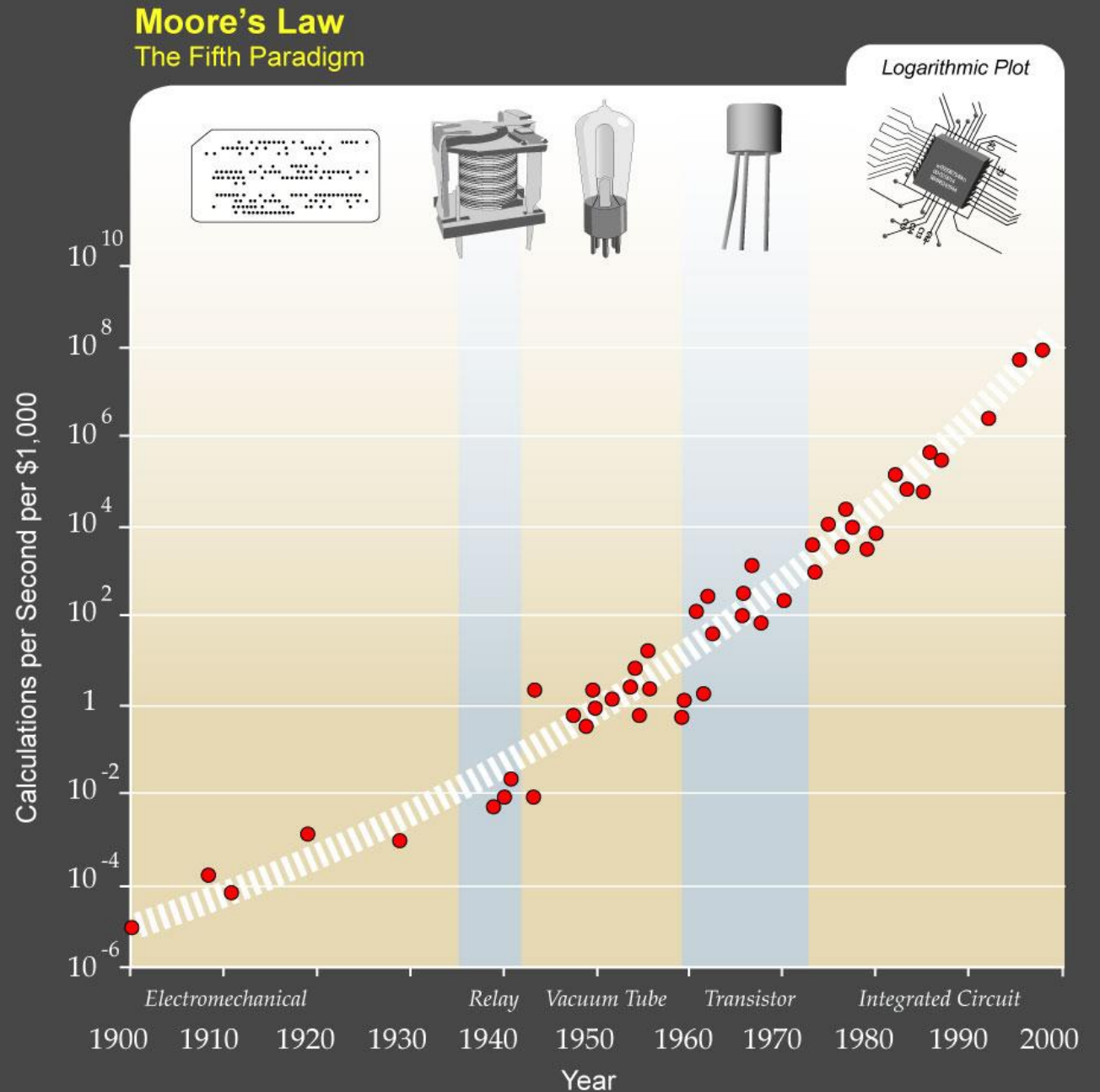
Evolve or Die!

Transcendent Man - Technology will accelerate exponentially. Within 25 years computers will have consciousness. Humans will soon be bionic.
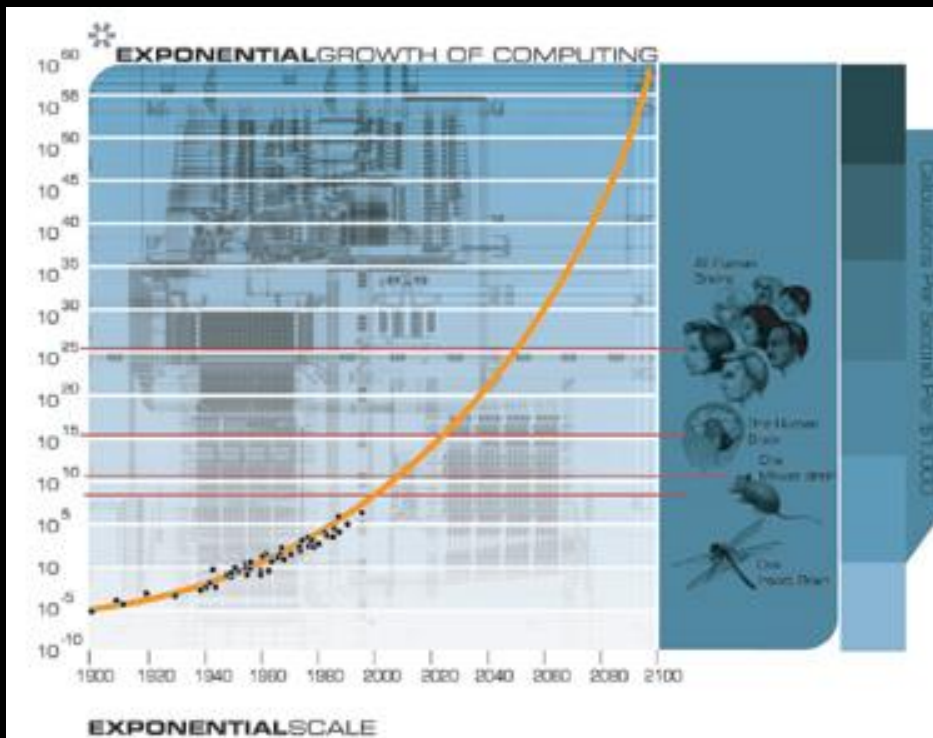
How We Became Posthuman 1999
N. Katherine Hayles

Here, at the inaugural moment of the computer age, the erasure of embodiment is performed so that "intelligence" becomes a property of the formal manipulation of symbols rather than enaction in the human lifeworld.

The Turing test was to set the agenda for artificial intelligence for the next three decades. In the push to achieve machines that can think, researchers performed again and again the erasure of embodiment at the heart of the Turing test. All that mattered was the formal generation and manipulation of informational patterns.

How We Became Posthuman 1999
N. Katherine Hayles

Aiding this process was a definition of information, formalized by Claude Shannon and Norbert Wiener, that conceptualized information as an entity distinct from the substrates carrying it. From this formulation, it was a small step to think of information as a kind of bodiless fluid that could flow between different substrates without loss of meaning or form.

The Moravec test-successor to the Turing test.
N. Katherine Hayles

Hans Moravec proposed that human identity is essentially an informational pattern rather than an embodied enaction.

...the Moravec test was designed to show that machines can become the repository of human consciousness—that machines can, for all practical purposes, become human beings.

You are the cyborg, and the cyborg is you.

BINA48 (Breakthrough Intelligence via Neural Architecture 48)

BINA48 is a humanoid robot, consisting of a bust-like head and shoulders mounted on a frame, developed by Hanson Robotics and released in 2010.

It was modeled after Martine Rothblatt's wife of the Terasem Movement, Incorporated (TMI).

BINA48 is designed to test the ability to download a person's consciousness into a non-biological or nanotech body after combining detailed data about a person with future consciousness software.

# The Human Connectome: A Structural Description of the Human Brain

The connection matrix of the human brain (the human "connectome") represents an indispensable foundation for basic and applied neurobiological research.

You are Your Connectome

This expresses the idea that your personal identity is encoded in the pattern of connections between your neurons. If this hypothesis is true, then any kind of personal change is ultimately about changing your connectome.
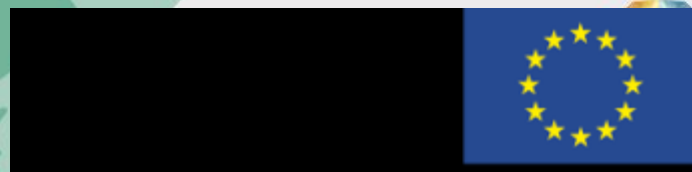
http://connectomethebook.com/?page_id=1260#sthash.ZMeJkdqp.dpuf

Reverse Engineer: How to Create a Mind (Kurzweil)
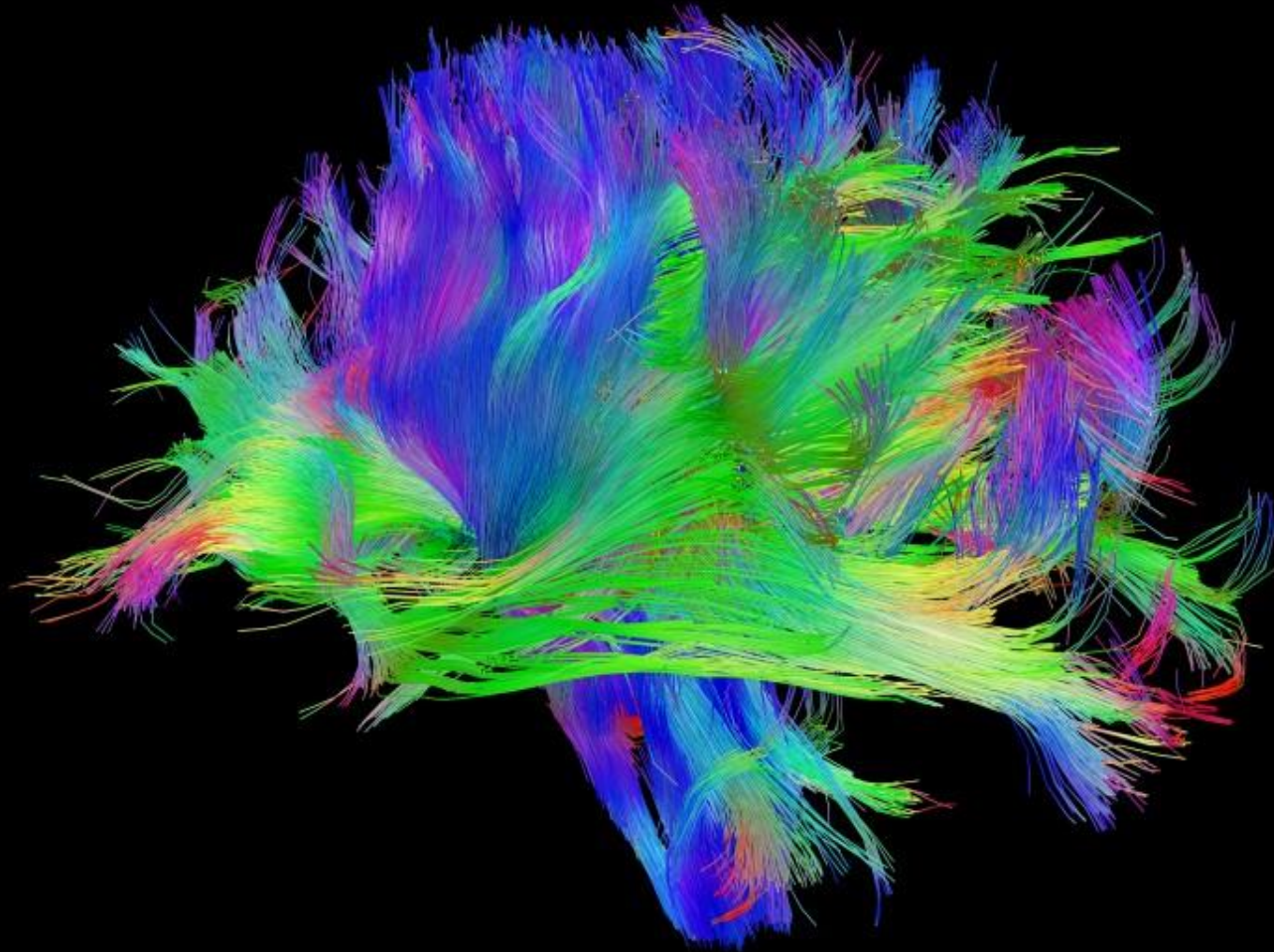
Human Brain Project

Human Brain Project

PLATFORM
RELEASE

30 March 2016

The Blue Brain Project

The **Blue Brain Project** is an attempt to create a synthetic brain by reverse-engineering mammalian brain circuitry. The aim of the project, founded in May 2005 by the Brain and Mind Institute of the *École Polytechnique Fédérale de Lausanne* (EPFL) in Switzerland, is to study the brain's architectural and functional principles.

The project is headed by the founding director Henry Markram and co-directed by Felix Schürmann and Sean Hill. Using a Blue Gene supercomputer running Michael Hines's NEURON software, the simulation does not consist simply of an artificial neural network, but involves a biologically realistic model of neurons.[1]
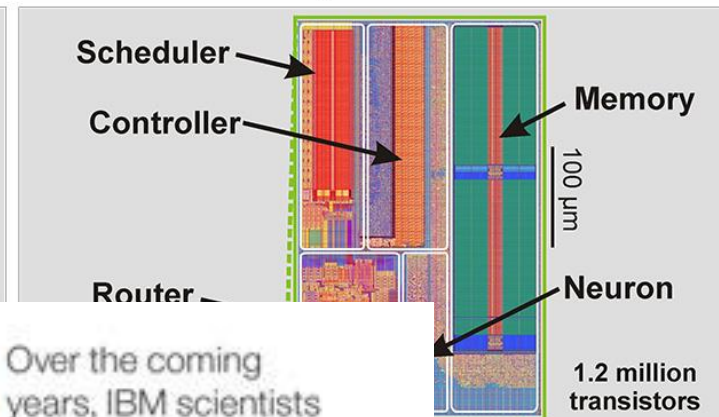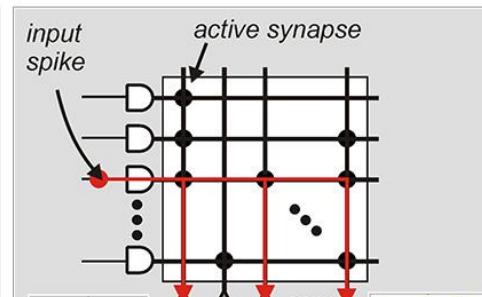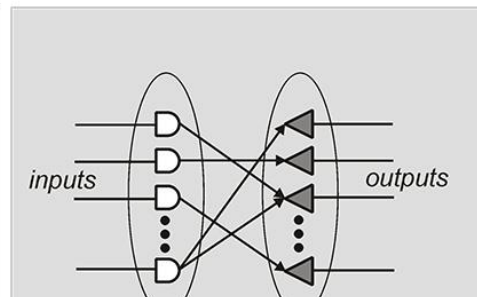
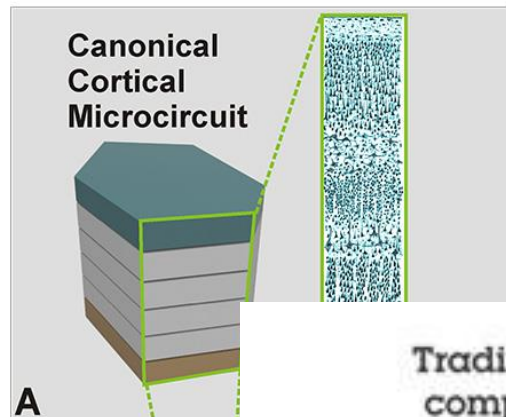**Neuroscience Inspiration**

Structural

Functional

Physical

Core

Canonical Cortical Microcircuit

inputs — outputs

input spike — active synapse

Scheduler
Controller
Memory
Router
Neuron

100 μm

1.2 million transistors

A

Chip

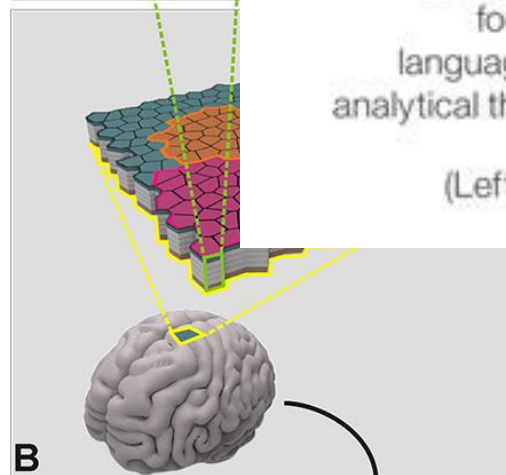Traditional computers focus on language and analytical thinking (Left brain)

Neurosynaptic chips address the senses and pattern recognition (Right brain)

Over the coming years, IBM scientists hope to meld the two capabilities together to create a holistic computing intelligence

5.4 billion transistors

IBM Neurosynaptic System 414

B

E

H Packet ("spike") Packet Router

N Local
W E
S

K

Multi-Chip

Temporal Lobe
Occipital Lobe
Basal Ganglia
Thalamus
Frontal Lobe
Parietal Lobe
Insula
Cingulate

C

F

I Example Packet Route

Split / Merge
Split / Merge

L

Core Grid
Split / Merge
I/O Ring
Chip-To-Chip Interconnect
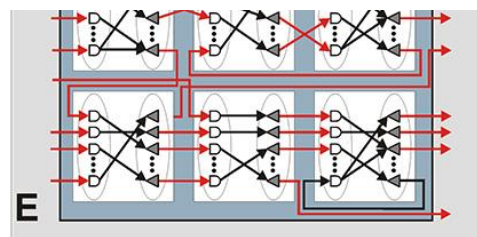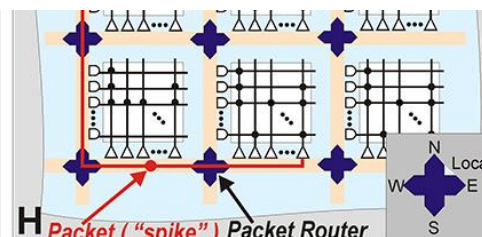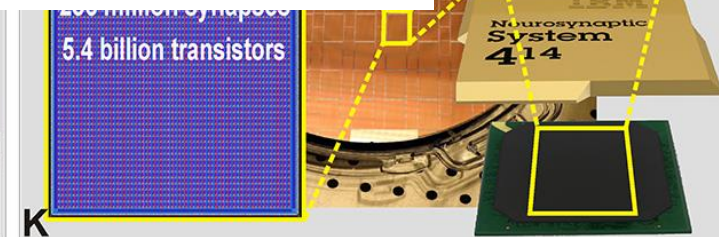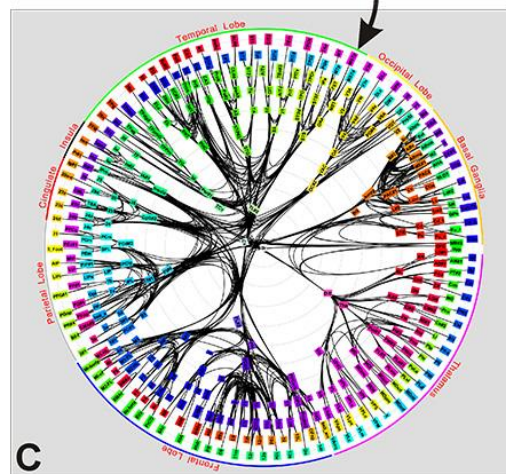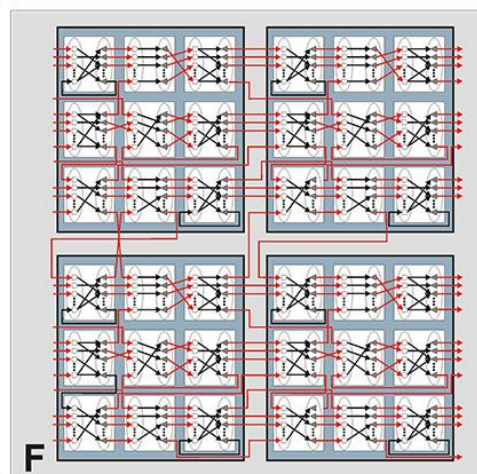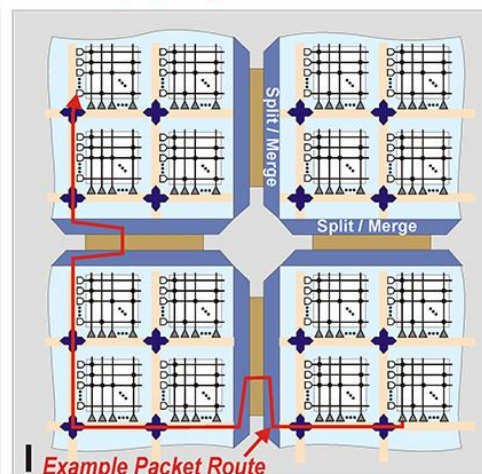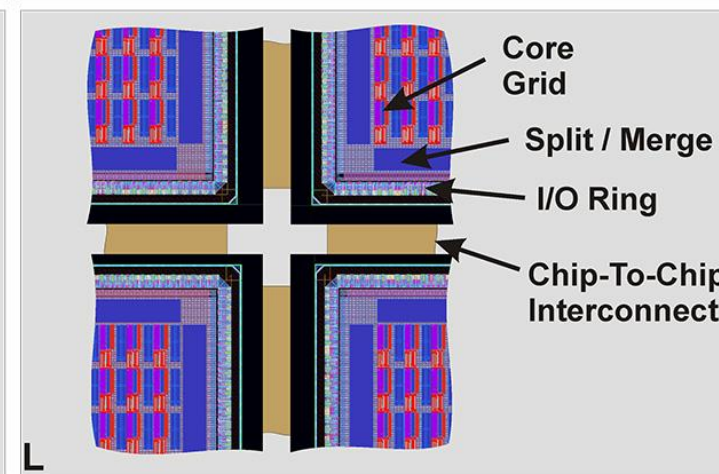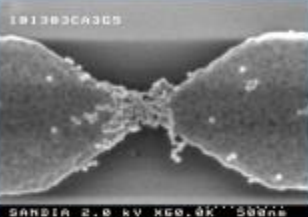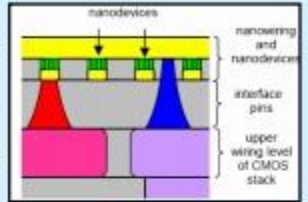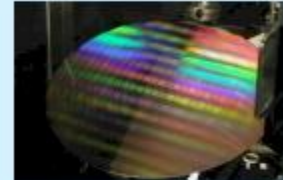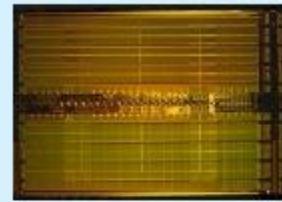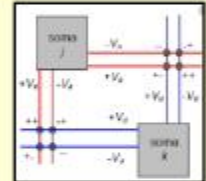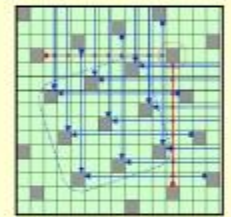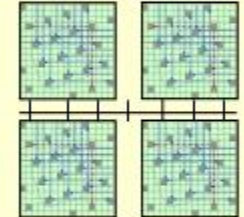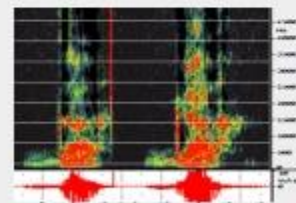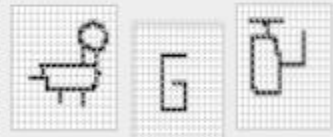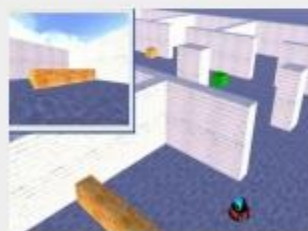
IBM Mapping the Path to Cognitive Computing

1996

Protecting Nuclear Stockpile
Department of Energy ASCI program takes delivery of first supercomputers **for stock pile stewardship**

2001

World's Single-Molecule Computer Circuit
Leads to smaller and faster computers consuming less power

2004

High Performance Computing Act of 2004 enacted

2004

Blue Gene
Supercomputer ushers in new era of **high-performance computing -** handling 280 trillion operations every second

2005

Cell Broadband Engine
"Supercomputer on a chip" for **gaming applications and systems**

2012

Modeling The Human Heart
Lawrence Livermore National Laboratory and IBM collaborate to create a real-time simulation of the human heart to **accelerate cures for heart disease** and model patient drug reactions

2012

2.5 Quintillion bytes of data
is created everyday due to the explosion mobile devices and social media

2008

Petaflop Barrier
Los Alamos National Lab and IBM create Roadrunner supercomputer – first to achieve **one quadrillion calculations/second**

2013

IBM Watson
IBM, WellPoint and Memorial Sloan-Kettering Cancer Center use Watson technology to sift through 1.5 million patient records, analyze clinical info and **give doctors treatment options in seconds**

SyNAPSE Brain-Inspired Chips
Next generation of chips that **emulate brain's abilities for perception, action and cognition**

Computer Simulation of Human Brain
Complex neuro brain simulation helps model brain for **exploration of neurological aliments**

Exascale Computing
Supercomputers that would be **80%+ faster than today's fastest computers** while consuming just a trickle of energy through designs inspired by human brain

SyNAPSE Program Plan

Is the universe a computer simulation?

$$\text{Probability you are a simulated mind} = \frac{\text{Simulated minds}}{\text{Simulated minds} + \text{Real minds}}$$

The *simulation hypothesis* proposes that our universe was created as a model, and might even be prone to "glitches."

Learn how scientists could test to see if we're real **>**

Source: PBS, University of Washington

ABSTRACT. This paper argues that at least one of the following propositions is true: (1) the human species is very likely to go extinct before reaching a "posthuman" stage; (2) any posthuman civilization is extremely unlikely to run a significant number of simulations of their evolutionary history (or variations thereof); (3) we are almost certainly living in a computer simulation. It follows that the belief that there is a significant chance that we will one day become posthumans who run ancestor-simulations is false, unless we are currently living in a simulation. A number of other consequences of this result are also discussed.

The Glitch

ABSTRACT. We explain why, if we live in a simulated reality, we might expect to see occasional glitches and small drifts in the supposed constants and laws of Nature over time.

Quantum Weirdness

The Heisenberg Uncertainty Principle

Moving electron

Photon

Photon wavelength changes

Electron velocity changes
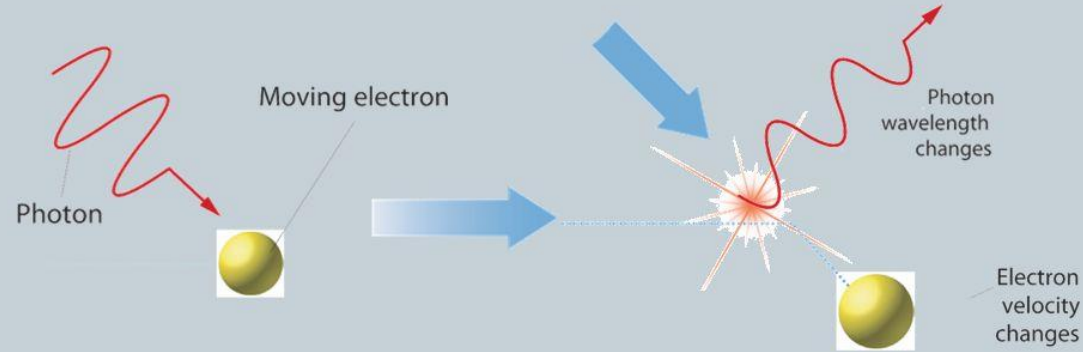
Before collision
A photon strikes an electron during an attempt to observe the electron's position.

After collision
The impact changes the electron's velocity, making it uncertain.

WAVE−PARTICLE WEIRDNESS

When quantum objects such as electrons are fired one by one through a pair of closely spaced slits, they behave like particles: each one hits a screen placed on the far side at exactly one point. But they also behave like waves: successive hits build up a banded interference pattern exactly like that generated by a wave passing through the slits (right). This wave−particle duality is described by a mathematical tool known as the wavefunction.

Electron gun

Slit partition

Individual electron

Accumulated electrons

Emerging interference pattern

Observing screen over time

Wave

Slit partition

Screen

Photon

Photon Source For +45° photons

Calcite Crystal

H

V

Photon Output is always H or V Never 45° Polarized
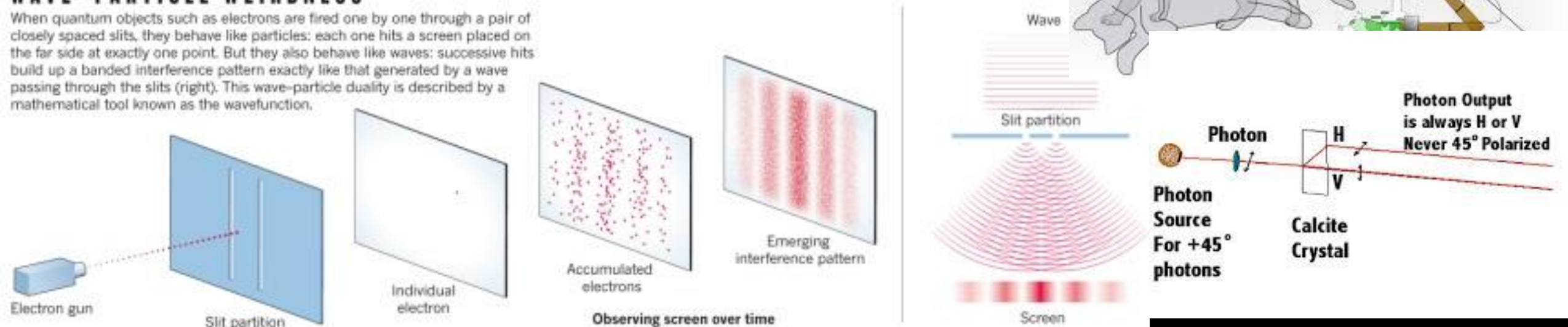
Complexification

DRAKE EQUATION

$$N = R \times f_s \times f_p \times n_e \times f_l \times f_i \times f_c \times L$$

- R — average rate of star formation
- f_s — fraction of good stars that have planetary systems
- n_e — number of planets aound these stars within an "ecoshell"
- f_l — fraction of those planets where life develops
- f_i — fraction of living species that develop intelligence
- f_c — fraction of intelligent species with communications technology
- L — lifetime of the "communicative phase"

Superstring Theory

- Best candidate for a TOE is superstring theory

- Assumes all fundamental particles are actually string-like objects rather than point-like objects

- Different particles correspond to different vibrational modes of the same string

Image credit: slideshare.net

LIMIT OF OBSERVATION

4×10^{26} METERS

OUR UNIVERSE PARALLEL UNIVERSE

PARALLEL UNIVERSE

$10^{10^{118}}$ METERS

IDENTICAL PARALLEL UNIVERSE

ALFRED T. KAMAJIAN

The **quilted multiverse theory** states that the universe is infinite, and therefore contains segments identical to the one we inhabit.
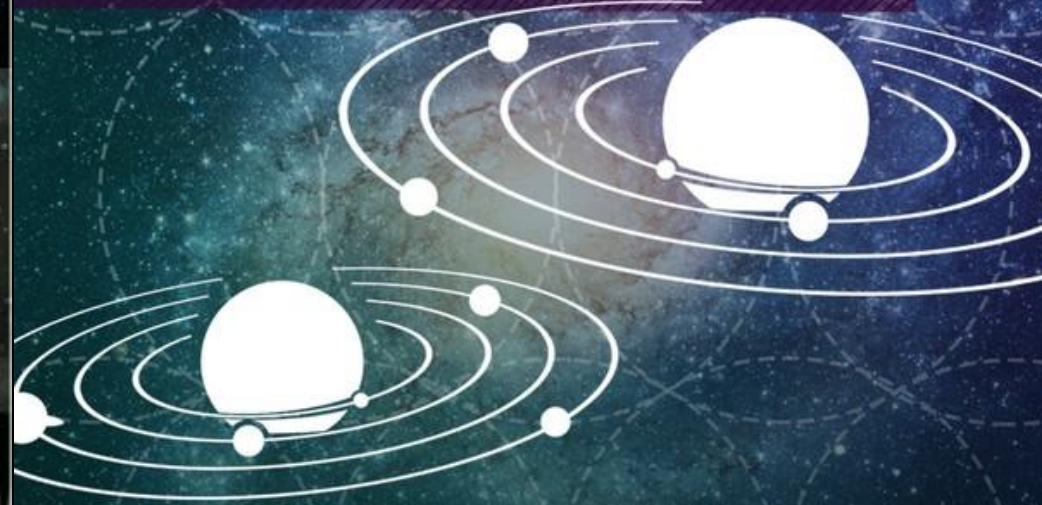
About $10^{10^{120}}$ light-years away, there could be *another you* on *another Earth*.

Source: NOVA, Aeon

Particles   Strings

M1   M2   M1   M2
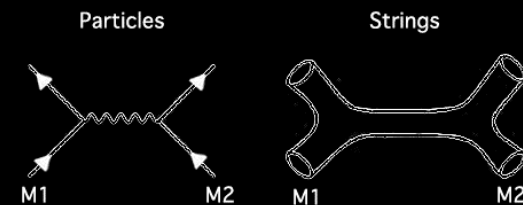
Many Minds Interpretation

Extends the many-worlds interpretation by proposing that the distinction between worlds should be at the level of the mind of individual observer. The concept was first introduced in 1970 by H. Dieter Zeh as a variant of the Hugh Everett interpretation in connection with quantum decoherence.

Zeh, H. D. (1970-03-01). "On the interpretation of measurement in quantum theory". Foundations of Physics **1** *(1): 69–76.*

Albert, David; Loewer, Barry (1988-01-01). "Interpreting the Many-Worlds Interpretation". Synthese **77** *(November): 195–213*

Everett, Hugh (1957-07-01). ""Relative State" Formulation of Quantum Mechanics". Reviews of Modern Physics **29** *(3): 454–462*

The Optimists

"It's theoretically possible to copy the brain onto a computer, and so provide a form of life after death."

- Stephen Hawking

The Blue Brain project expects to have a full human-scale simulation of the cerebral cortex by 2018. I think that's a little optimistic, actually, but I do make the case that by 2029 we will have very detailed models and simulations of all the different brain regions.

- Ray Kurzweil

"the transfer of an individual's personality to a more advanced non-biological carrier, and extending life, including to the point of immortality."

- Dmitry Itskov, 2045 Initiative

Transcendent Man (2009)

Ultimately this virtual reality will go inside the brain and then really will be fully merging with all of the senses. Virtual reality ultimately will have all of the features of real reality plus a lot more that you can chose from millions of virtual environments. You can be someone else, you don't have to pick the same boring body every time you can be different people and different situations and over time our biological bodies will become obsolete. We'll have many bodies and we'll look back at the idea of having one body and being dependent on just one biological body and having no back-up for a mind file as a very primitive time.

- Ray Kurzweil

The Pessimists

"The only thing wrong with immortality is that it tends to go on forever" – Herb Caen

"Millions long for immortality who don't know what to do with themselves on a rainy Sunday afternoon." – Susan Ertz

Oh brother where for art thou?

So When Do You Do It?

The Seven Ages of Man

2. Birth & Early Childhood
3. Youth
4. Adolescence
5. Middle Age & Elderly
6. Death & Beyond.

Destructive or Non-Destructive?

Destructive Book Scanning
Base Package *

✓ $13.95 for the first book

✓ $6.95 each additional book

✓ $.06/page

✓ No min.or max. order

✓ 1-2 day turnaround time

>>> Our **destructive scanning services are lower-cost**. We remove the spine of the book and cut the pages at the margins, and the book will not be returned.

Glitches and Quality Assurance

- Granularity: what scale? (femto-, micropico-, pico-, nano-)
- Sufficient Sampling Rate/Bandwidth to avoid aliasing
- Sufficient Number of Bits per sample
- Sampling/Quantization Errors
- Storage capacity (as needed in the cloud/peta-, exa-)
- Checksum errors
- Bad sectors

Mi Casa...Su Casa?

- What is your virtual address: how do I reach you?
- Distributed among the server farms
- The original...the Backup.... the copy?
- Not a brain in a vat
- A Virtualized Connectome

Upgrade or Be Deprecated

ATTACK ORIGINS ▽

#		Country
340	🇨🇳	China
298	🇺🇸	United States
97	🇳🇱	Netherlands
57	🇨🇦	Canada
56	🇰🇷	South Korea
50	🇷🇺	Russia
48	🇭🇰	Hong Kong
45	🇫🇷	France
40	🇸🇪	Sweden
32	🇮🇳	India

ATTACK TARGETS ▽

#		Country
999	🇺🇸	United States
54	🇭🇰	Hong Kong
33	🇵🇹	Portugal
29	🇧🇬	Bulgaria
28	🇨🇦	Canada
26	🇹🇷	Turkey
26	🇩🇪	Germany
23	🇬🇧	United Kingdom
22	🇫🇷	France
18	🇸🇬	Singapore

ATTACKS ▽

Timestamp	Attacker			Target	Type	
	Organization	Location	IP	Location	Service	Port
2014-06-25 11:47:03.66	Hurricane Electric	Stanford, United States	184.105.139.114	Seattle, United States	NetController, ntp	123
2014-06-25 11:47:03.97	TOT Public Company	Thanyaburi, Thailand	101.108.250.0	Saint Louis, United States	unknown	52421
2014-06-25 11:47:04.53	Webhosting.Net	Miami, United States	67.215.180.162	Miami, United States	discard	9
2014-06-25 11:47:04.53	Webhosting.Net	Miami, United States	67.215.180.162	Miami, United States	discard	9

ATTACK TYPES ▽

#	●	Service	Port
115	●	ssh	22
93	●	ms-term-services	3389
84	●	isakmp	500
70	●	microsoft-ds	445
50	●	http	80
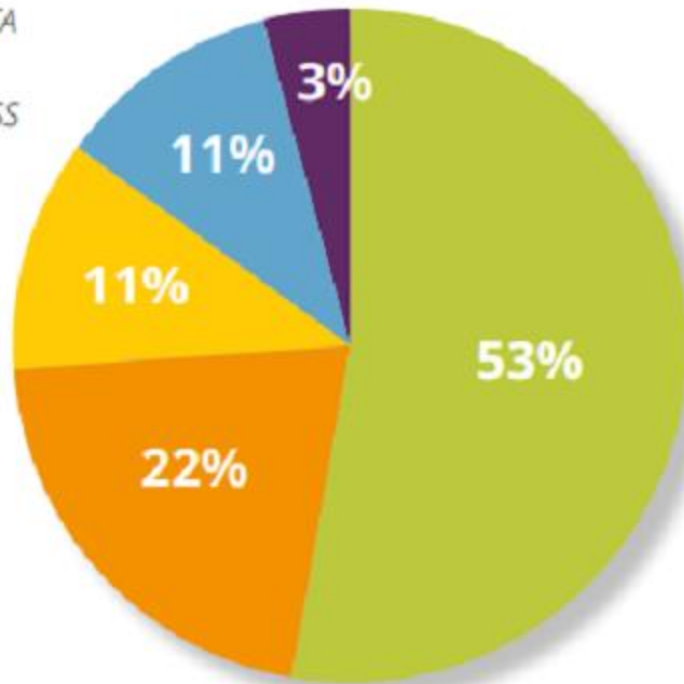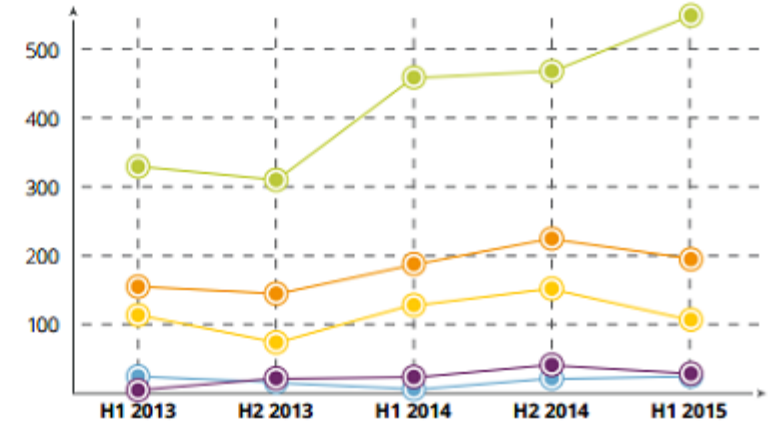
Limited Liability Corporations are People Too!

"The corporation was very lonely, because people thought it was different from them."

THE ULTIMATE ONLINE BRAND PROTECTION

ENTERPRISE BRAND PROTECTION SUITE

PROTECT YOUR BRAND AROUND THE WORLD

Globalization and the Internet put your Intellectual Property at risk!

TRADEMARK REGISTRATIONS – WORLDWIDE

IDEAS   **REPUTATION**   **IMAGE**

Why settle for less: you're worth it!

Increase your bandwidth!

Vast and fast connectivity, access to data, why should this self accept limitations?

Assuming motivations, goals and dreams would this 'self' seek self-dissolution and become indistinguishable from its habitat?

The Haves and the Have More's

Special Report: How to Market to the Super Rich-4 Challenges and 8 Strategies

SUMMARY: Want to market to the Paris Hiltons of the world? When it comes to targeting the uber wealthy, you can't make the mistake of thinking one size fits all. Just like the general population, the high net worth crowd has its own unique needs and desires.

Research on the affluent is scarce, and what is available is jealously guarded.

https://www.marketingsherpa.com/article/how-to/how-to-market-to-super

Why Settle for Less When You Can Have More?
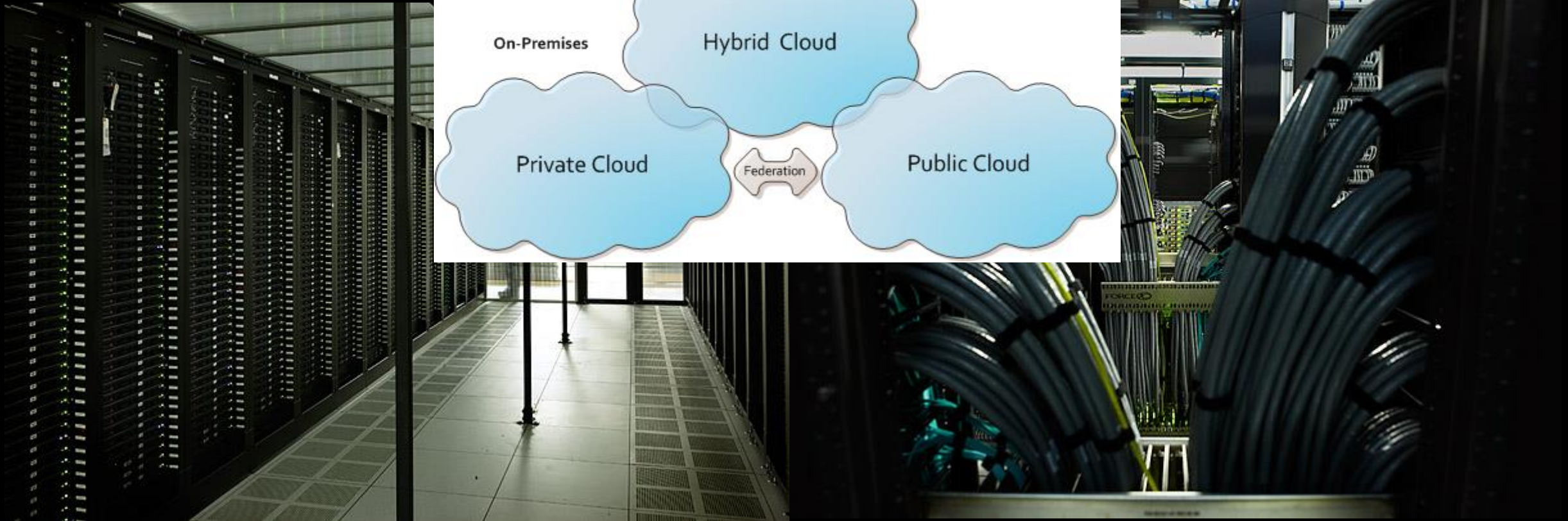
INTERNET SPEEDS AND COSTS AROUND THE WORLD

SOURCE: OECD BROADBAND PORTAL
DATA AS OF SEPTEMBER 2010

PRICE / MONTH FOR 1mbps

$0 - $2.00 $2.01 - $4.00 $4.01 - $6.00 $6.00 +
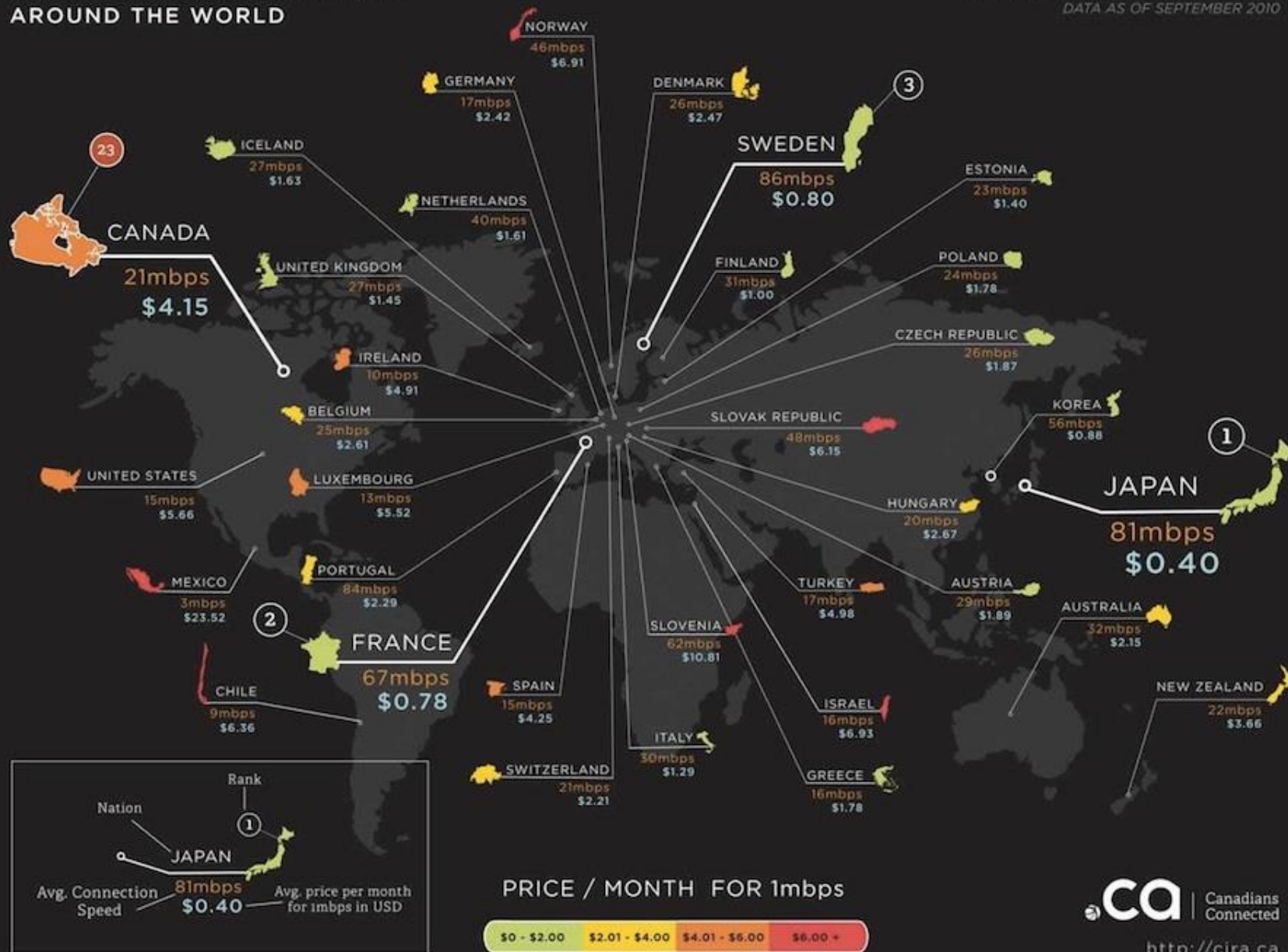
The Freemium Model (for the hoi polloi)

Terms of Service

- This agreement was written in English (US). To the extent any translated version of this agreement conflicts with the English version, the English version controls. Please note that Section 16 contains certain changes to the general terms for users outside the United States.

- Date of Last Revision: January 30, 2015

- **Statement of Rights and Responsibilities**
This Statement of Rights and Responsibilities ("Statement," "Terms," or "SRR") derives from the Facebook Principles, and is our terms of service that governs our relationship with users and others who interact with Facebook, as well as Facebook brands, products and services, which we call the "Facebook Services" or "Services". By using or accessing the Facebook Services, you agree to this Statement, as updated from time to time in accordance with Section 13 below. Additionally, you will find resources at the end of this document that help you understand how Facebook works.

- Because Facebook provides a wide range of Services, we may ask you to review and accept supplemental terms that apply to your interaction with a specific app, product, or service. To the extent those supplemental terms conflict with this SRR, the supplemental terms associated with the app, product, or service govern with respect to your use of such app, product or service to the extent of the conflict.

- **Privacy**

  Your privacy is very important to us. We designed our Data Policy to make important disclosures about how you can use Facebook to share with others and how we collect and can use your content and information. We encourage you to read the Data Policy, and to use it to help you make informed decisions.

- **Sharing Your Content and Information**

  You own all of the content and information you post on Facebook, and you can control how it is shared through your privacy and application settings. In addition:
    - For content that is covered by intellectual property rights, like photos and videos (IP content), you specifically give us the following permission, subject to your privacy and application settings: you grant us a non-exclusive, transferable, sub-licensable, royalty-free, worldwide license to use any IP content that you post on or in connection with Facebook (IP License). This IP License ends when you delete your IP content or your account unless your content has been shared with others, and they have not deleted it.

"In general, how concerned are you about the companies you interact with accessing the following personal information?"

(Responses of 4 and 5 on a scale of 1 [not concerned] to 5 [concerned])

Blues indicate behavioral data

Greens indicate individual data

Oranges indicate derived data

Demographic information (e.g., age, gender, ethnicity, or household income) 38%

Your Internet browsing history 52%

Name 42%

Your employment or education history 40%

Your Social Security number/ social insurance number 72%

Your mailing address 50%

Your email address 46%

Your phone number 58%

Your driver's license number 62%

Your transaction history with that company 40%

Your credit card number 71%

Your credit score 57%

Information from your social networking profile (e.g., Facebook page) 38%

Online reviews you posted of products or services 19%

Your transaction history with other companies 49%

Base: 37,350 US online adults ages 18 and older

61039

Who Pays the Bill?

AVERAGE DATA CENTER POWER ALLOCATION

- Other 11%
- Servers 46%
- HVAC Cooling 23%
- HVAC Fans 8%
- UPS 8%
- Lighting 4%
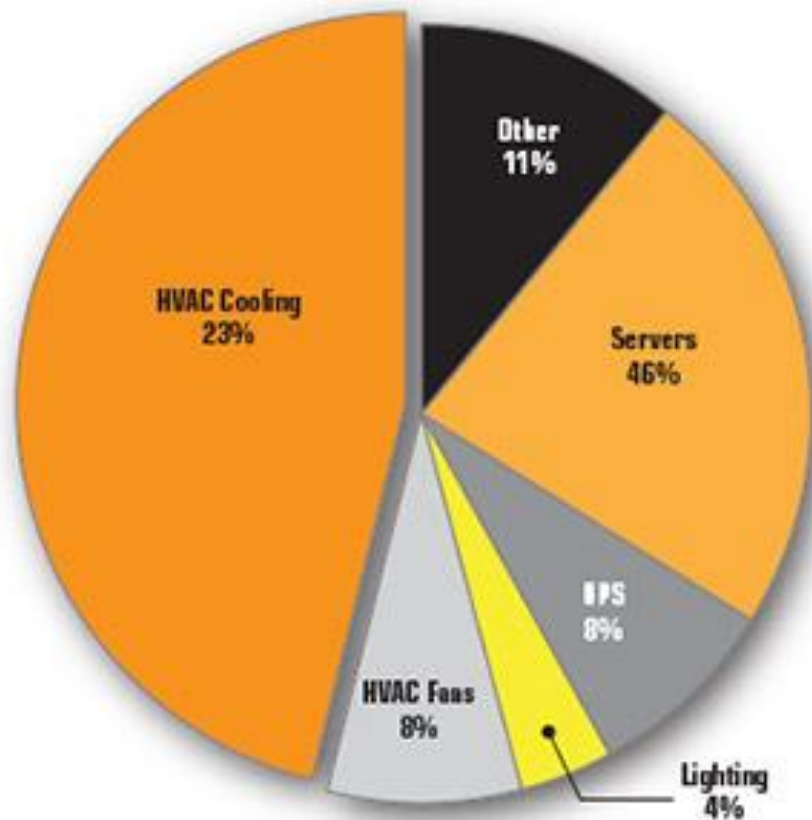
The ALCOR Model

An Alcor member is a person who has full legal and financial arrangements in effect for cryopreservation with Alcor. (Associate membership is available for those who support Alcor's mission and/or who are considering making cryonics arrangements in the future.) Becoming an Alcor member is easy and surprisingly affordable, if you are in good health and eligible for life insurance, which will pay for your cryopreservation. (If you are not insurable, other financial arrangements can be made. Please ask us for details.)

I. Required Cryopreservation Funding Minimums: Before membership approval can be granted, Alcor requires the Member to guarantee a certain level of funding which will be paid to Alcor upon the legal death of the Member to support Comprehensive Member Standby (CMS), in addition to the cryopreservation, long-term care, and, if it becomes possible, resuscitation of the Member. (See Cryopreservation Agreement, Section I, DUTIES OF THE MEMBER, Article 4.) Current minimum funding levels are:

Minimum Cryopreservation Funding:
$200,000.00 Whole Body Cryopreservation ($115,000 to the Patient Care Trust, $60,000 for cryopreservation, $25,000.00 to the CMS Fund).

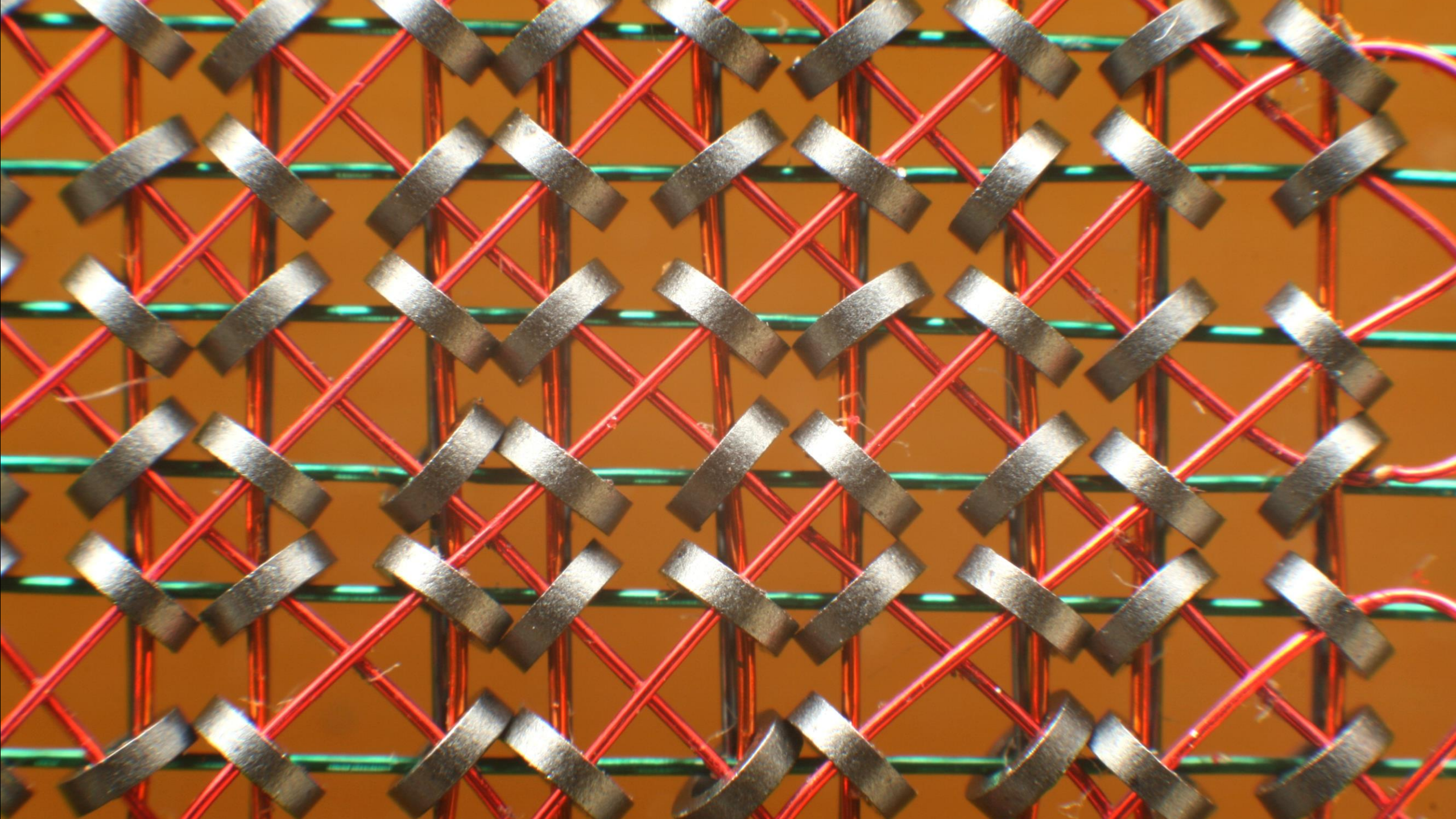$ 80,000.00 Neurocryopreservation ($25,000 to the Patient Care Trust, $30,000 for cryopreservation, $25,000.00 to the CMS Fund).

Zero Sum Mindset?

What of the other selves?

Will they inevitably compete for resources, bandwidth, and electrical power?

Will the 1% be able to afford the most costly technology leading to a virtual caste system operating at different speeds–a diaspora of competing disembodied selves?

Weaponized software

A Core Wars program, or a warrior can copy itself and then split to the copy, which is much like cell division, or jump to the copy, which is more like a binological equivalent of movement. A process can cause another process to stop executing (or kill it, if you will), which is somewhat like biological predation.

instructions
DAT - a data value, non-executable.
MOV - move data from one address to another
ADD - add two values and store in the second location
SUB - subtract two values and store in the second location
CMP - compare two locations and skip an instruction if they contain identical information
JMP - unconditional jump to some address
JMZ - jump to some address on the condition of some data value being zero
JMN - jump to some address on the condition of some data value being non-zero
SPL - split into two processes, one starting at the next address and one at a specified address
DJN - decrement some data value and jump to some address if the value decremented is now zero
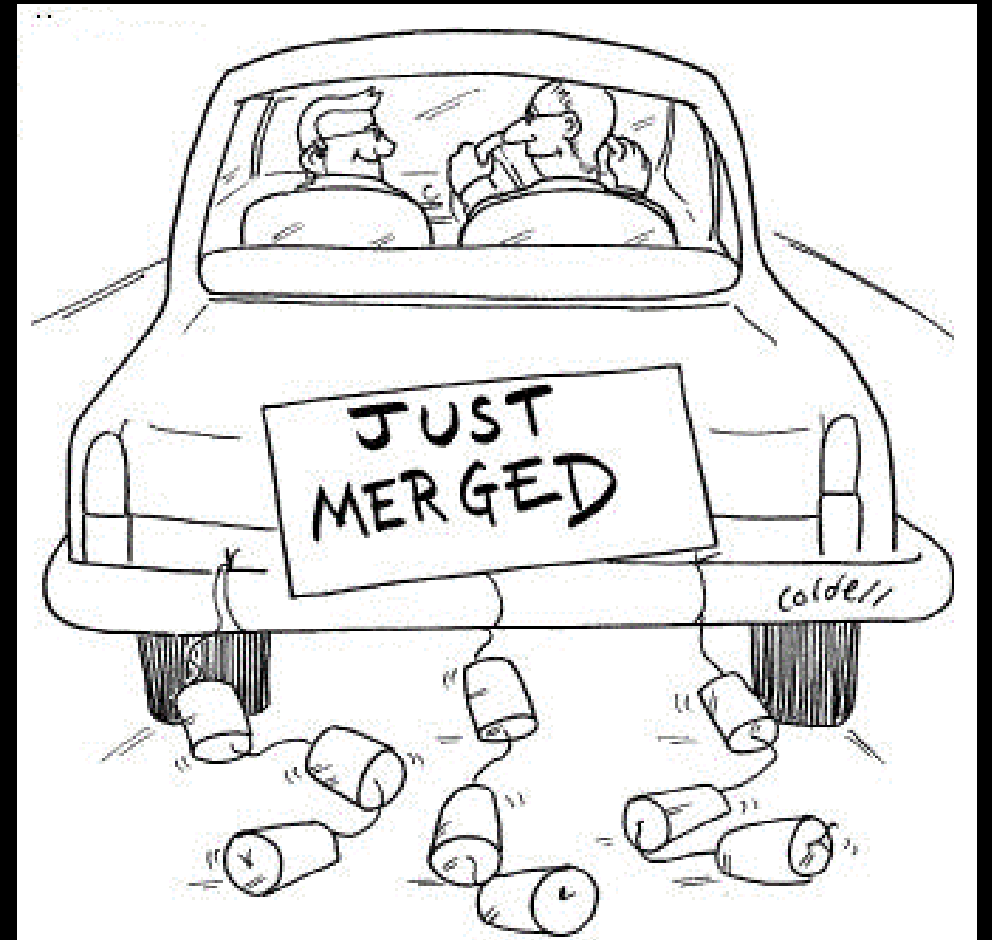addressing modes
- immediate
$ - direct
@ - indirect
< - indirect with predecrement
        illustration 1: the Redcode instruction set

Survive Hostile Takeovers and Mergers

"He was the victim of a very hostile takeover."

JUST MERGED

Privacy, Threats, Liabilities

- Denial of Service Attacks/Spam
- Hacking: Data Breach
- Identity Theft
- Zombified: recruited
- Data Collection
- Backup errors
- Maintenance Failures
- Upgrades/updates
- Deprecated/Obsolete
- Surveillance / handing over encryption key
- Mandatory Insurance against damages and loss
- Electrical Failure
- Mergers and acquisitions
- Hostile takeovers: breakup and sale of assets
- Chapter 11
- Terrorist Attack
- Other acts of God

Shutdown Scenarios: Murder?

Dave... I'm afraid I can't let you do that...

Unrecognizable to its original self?

- Backup copies
- Upgrade regime and maintenance
- Multiple perspectives: bandwidth capacity limits
- Interoperability – merger with other AI's
- The challenge to maintain the boundaries of self? Control, Containment Problem
- Values alignment, moral machines
- Recovered, reconstructed, false memories

Erosion of the Self?

- Where is the locus of the self?
- Emotions, sociability, embodiment, theory of mind, empathy, consciousness, understanding (Wendell Wallach)
- Machine learning algorithms – rapid self-evolution through recursive self-improvement
- The self as a narrative of continuity is ruptured
- Loss of Social Network: Loss of friends, loss of direct human to human contact
- Loss of the Extended Self
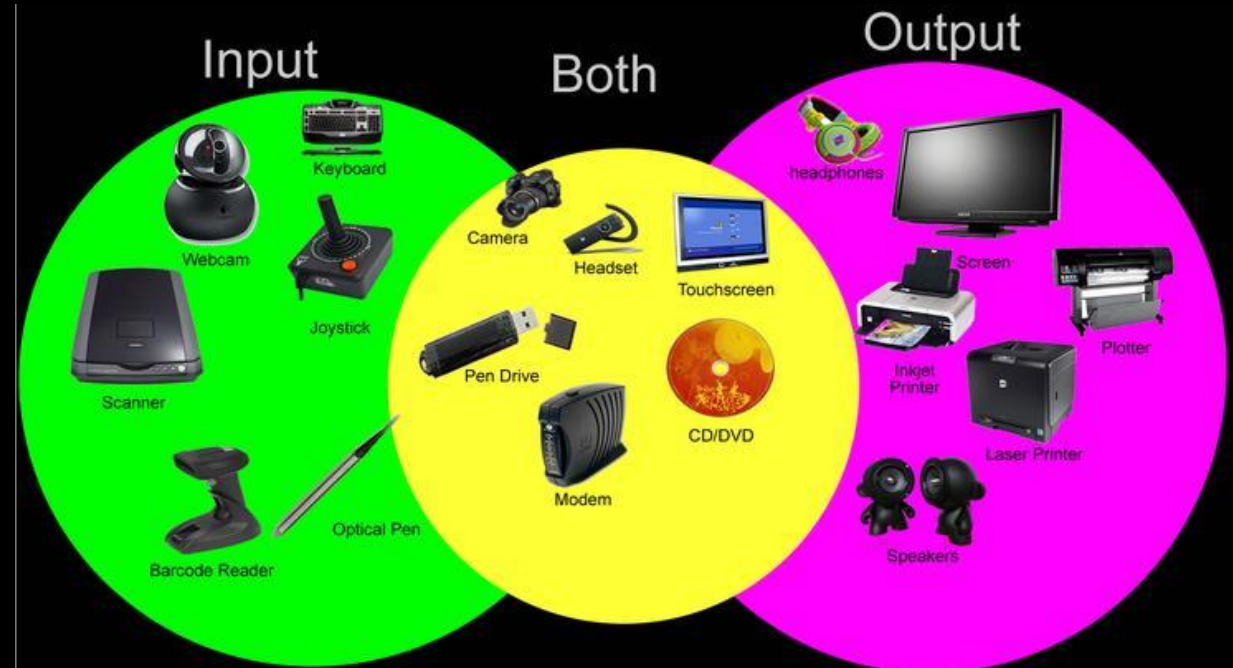- Interoperability – merger with other AI's

i/o (bio) Sensors and Transducers: Networks

This is the monstrosity in love, lady, that the will is infinite and the execution confined, that the desire is boundless and the act a slave to limit.

William Shakespeare
— Troilus and Cressida, act 3, scene 2, *Troilus*
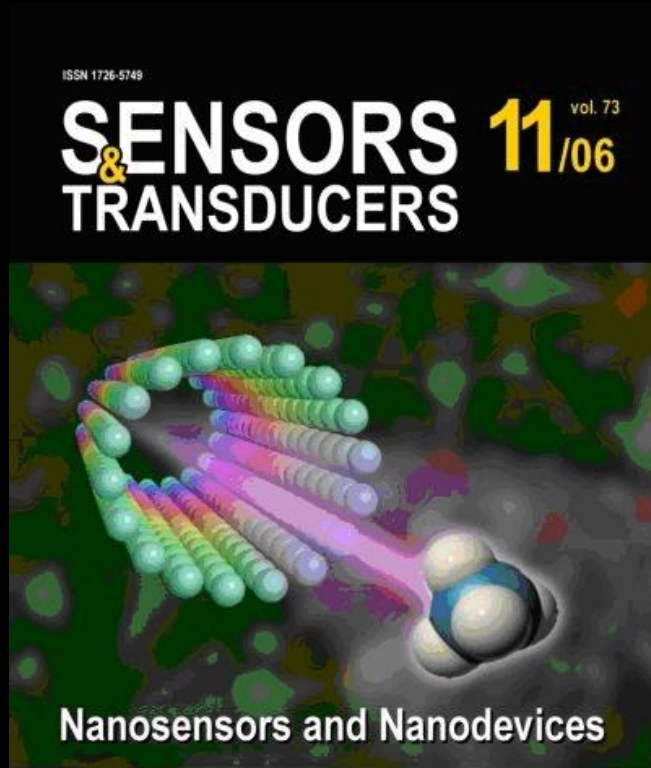
Left behind: embodied gut feelings

- Moral judgements are result of affective components (Greene and Haidt 2002: Haidt et alia 2002)
- Disgust/repugnance (Lerner et alia 2004: Wheatley and Haidt 2005)
- Perception, emotion and judgement grounded in sensorimotor mechanisms motivate the body specificity thesis (Casasanto 2011, 2009; de la Vega et alia 2012; Brunye et alia 2012)
- Damasio's somatic marker hypothesis (1994, 1996) bodily states triggered by emotional experiences are reactived in similar situations to avoid harm.
- Ventro-medial-prefrontal cortex (VMPC) patients impair judgement

Dissociation: DSM-V

Two or more distinct identities or personality states are present, each with its own relatively enduring pattern of perceiving, relating to and thinking about the environment and self.

Personality states may be seen as an "experience of possession." These states "involve(s) marked discontinuity in sense of self and sense of agency, accompanied by related alterations in affect, behavior, consciousness, memory, perception, cognition, and/or sensory-motor functioning.

HealthyPlace.com
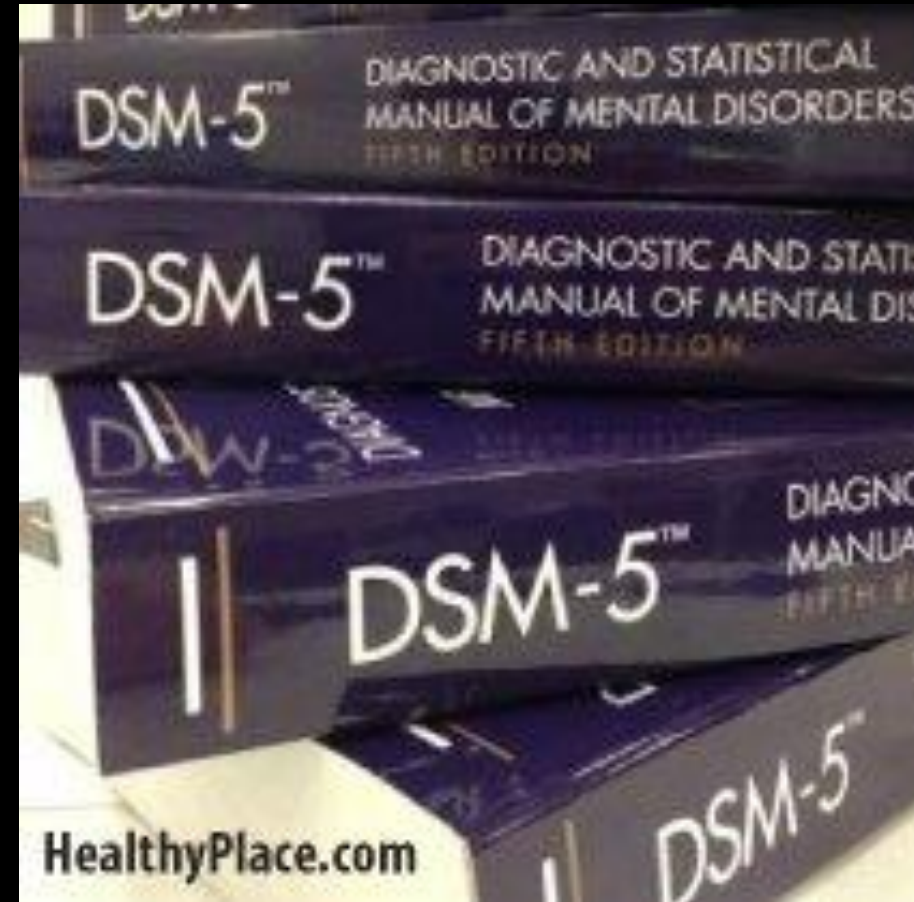
Depersonalization/Derealization Disorder

People may describe some of these experiences or feelings:

I am no one, I have no self

My head feels as if it's filled with cotton wool

I feel robotic, like an automation

I know I have feelings but I don't feel them

My thoughts don't feel like mine

I feel like I'm watching myself from outside myself Out of body experiences ("split self")

Everything around me seems artificial, lifeless, or dead

It's like there is a glass wall between myself and the world Things look blurry, like being in a dream or looking through a fog (visual distortion).

A Tethered but Fungible Existence

- A body without organs: artificial sensing and feeling
- Quality of 'life' or greatly improverished 'existence'
- Autonomy
- Dignity
- Human Rights
- Constitutional Rights
- Incorporation = personhood
- Legal Standing
- Legal Representation

Who owns this "self"?

- Is it a legal person without a home, address or country?
- Is it a 'virtual' Netizen of the internet - a lawless place of rogue and malevolent malware that imperils this lonely self?
- Will it be a refugée under suspicion in permanent limbo?
- Will its utterances be treated as spam?
- Will hackers target this self with a denial of service attack?
- Who will come to its aid?
- Where will it seek safe harbor?
- What nation state will intervene to protect its inalienable human(?) rights?
- In what court of law will it have standing to petition and seek redress of wrongs?
- Will government provide consumer protection from purveyors of pirated and corrupted copies of Deep Mind or Watson that promise an elixir of the afterlife?

A Collect of Philosophy
Wallace Stevens

"He[Leibniz] held that reality consists of a mass of monads, like bees clinging to a branch, although for him the branch was merely a different set of monads.

Bertrand Russell said that Leibniz's monads were gods. Monad by monad, then, by way of the course of an immense unity, he achieved God."

"in a system of monads, we come, in the end, to a man who is not only a man but sea and mountain, too, and to a God who is not only all these: man and sea and mountain but a God as well."

Could uploading be a purgatory for the nowhere man?

Caveat Emptor!

He's a real nowhere man
Sitting in his nowhere land
Making all his nowhere plans
for nobody

Doesn't have a point of view
Knows not where he's going to
Isn't he a bit like you and me?

Thank you!

Greg.garvey@Quinnipiac.edu

(203) 500-7820

Game Design and Development

Visual and Performing Arts

Qujinnipiac University

ELIZA-The Virtual Therapist

http://ict.usc.edu/prototypes/simsensei/

What are Quantum Computers?

Centre for Quantum Computation

Why quantum computation?

The history of computer technology has involved a sequence of changes from one type of physical realisation to another – from gears to relays to valves to transistors to integrated circuits ... and so on. Today's advanced lithographic techniques can create chips with features only a fraction of micron wide. Soon they will yield even smaller parts and inevitably reach a point where logic gates are so small that they are made out of only a handful of atoms.

Every 18 months microprocessors double in speed
FASTER = SMALLER

Babbage's Engine
Silicon Wafers
Atoms

1 meter
0.000001 m
0.0000000001 m

On the atomic scale matter obeys the rules of quantum mechanics, which are quite different from the classical rules that determine the properties of conventional logic gates. So if computers are to become smaller in the future, new, quantum technology must replace or supplement what we have now. The point is, however, that quantum technology can offer much more than cramming more and more bits onto silicon and multiplying the clock–speed of microprocessors. It can support an entirely new kind of computation with qualitatively new algorithms based on quantum principles!
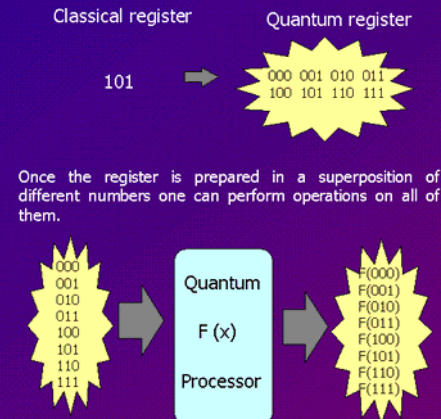
What are qubits?

From a physical point of view a bit is a physical system which can be prepared in one of the two different states representing two logical values : no or yes, false or true, or simply 0 or 1.

Classical Bit   Quantum Bit

0 or 1   0 or 1 or 01
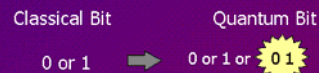
Quantum bits, called qubits, are implemented using quantum mechanical two state systems; these are not confined to their two basic states but can also exist in superpositions: effectively this means that the qubit is both in state 0 and state 1.


Any classical register composed of three bits can store in a given moment of time only one out of eight different numbers. A quantum register composed of three qubits can store in a given moment of time all eight numbers in a quantum superposition.

Classical register   Quantum register

101   000 001 010 011
             100 101 110 111

Once the register is prepared in a superposition of different numbers one can perform operations on all of them.

000 001 010 011 100 101 110 111 → Quantum F(x) Processor → F(000) F(001) F(010) F(011) F(100) F(101) F(110) F(111)

Thus quantum computers can perform many different calculations in parallel: a system with N qubits can perform 2^N calculations at once! This has impact on the execution time and memory required in the process of computation and determines the efficiency of algorithms.

How powerful are quantum computers?

For an algorithm to be efficient, the time it takes to execute the algorithm must increase no faster than a polynomial function of the size of the input. Think about the input size as the total number of bits needed to specify the input to the problem — for example, the number of bits needed to encode the number we want to factorize. If the best algorithm we know for a particular problem has the execution time (viewed as a function of the size of the input) bounded by a polynomial then we say that the problem belongs to class P.

Exp(L)
Ln
Execution Time
INPUT SIZE L

EXP
NP
P
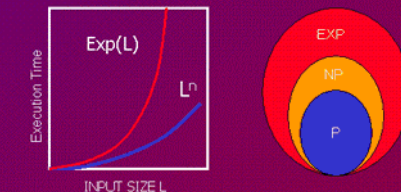
Problems outside class P are known as hard problems. Thus we say, for example, that multiplication is in P whereas factorization is not in P. "Hard" in this case does not mean "impossible to solve" or "non–computable." It means that the physical resources needed to factor a large number scale up such that, for all practical purposes, it can be regarded as intractable. However some quantum algorithms can turn hard mathematical problems into easy ones – factoring being the most striking example so far.

RSA Data Security.

The difficulty of factorisation underpins the security of what are currently the most trusted methods of public key encryption, in particular of the RSA (Rivest, Shamir and Adelman) system, which is often used to protect electronic bank accounts. Once a quantum factorisation engine (a special–purpose quantum computer for factorising large numbers) is built, all such cryptographic systems will become insecure.

Potential use of quantum factoring for code–breaking purposes has raised the obvious suggestion of building a quantum computer.

How to build quantum computers?

INPUT   Quantum logic gates   OUTPUT
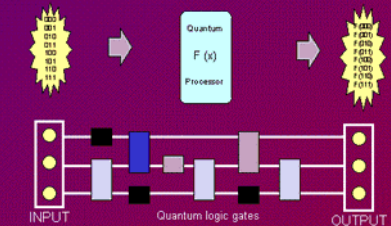
In principle we know how to build a quantum computer; we start with simple quantum logic gates and connect them up into quantum networks. A quantum logic gate, like a classical gate, is a very simple computing device that performs one elementary quantum operation, usually on two qubits, in a given time. Of course, quantum logic gates differ from their classical counterparts in that they can create, and perform operations on, quantum superpositions.

Want to learn more?

Please visit the website cam.qubit.org


Can we build quantum computers?

As the number of quantum gates in a network increases, we quickly run into some serious practical problems. The more interacting qubits are involved, the harder it tends to be to engineer the interaction that would display the quantum properties. The more components there are, the more likely it is that quantum information will spread outside the quantum computer and be lost into the environment, thus spoiling the computation. This process is called decoherence. Thus our task is to engineer sub–microscopic systems in which qubits affect each other but not the environment.

What are the most promising technologies?

It is not clear which technology will support quantum computation in future. Today simple quantum logic gates involving two qubits are being realised in laboratories. Current experiments range from trapped ions...

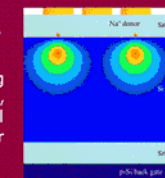Glowing and vibrating qubits, here, calcium ions in a linear ion trap.
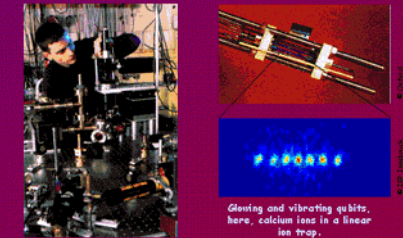
...via atoms in an array of potential wells created by a pattern of crossed laser beams...
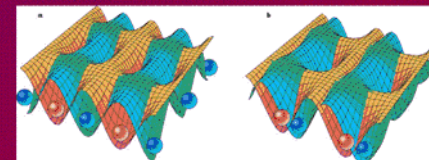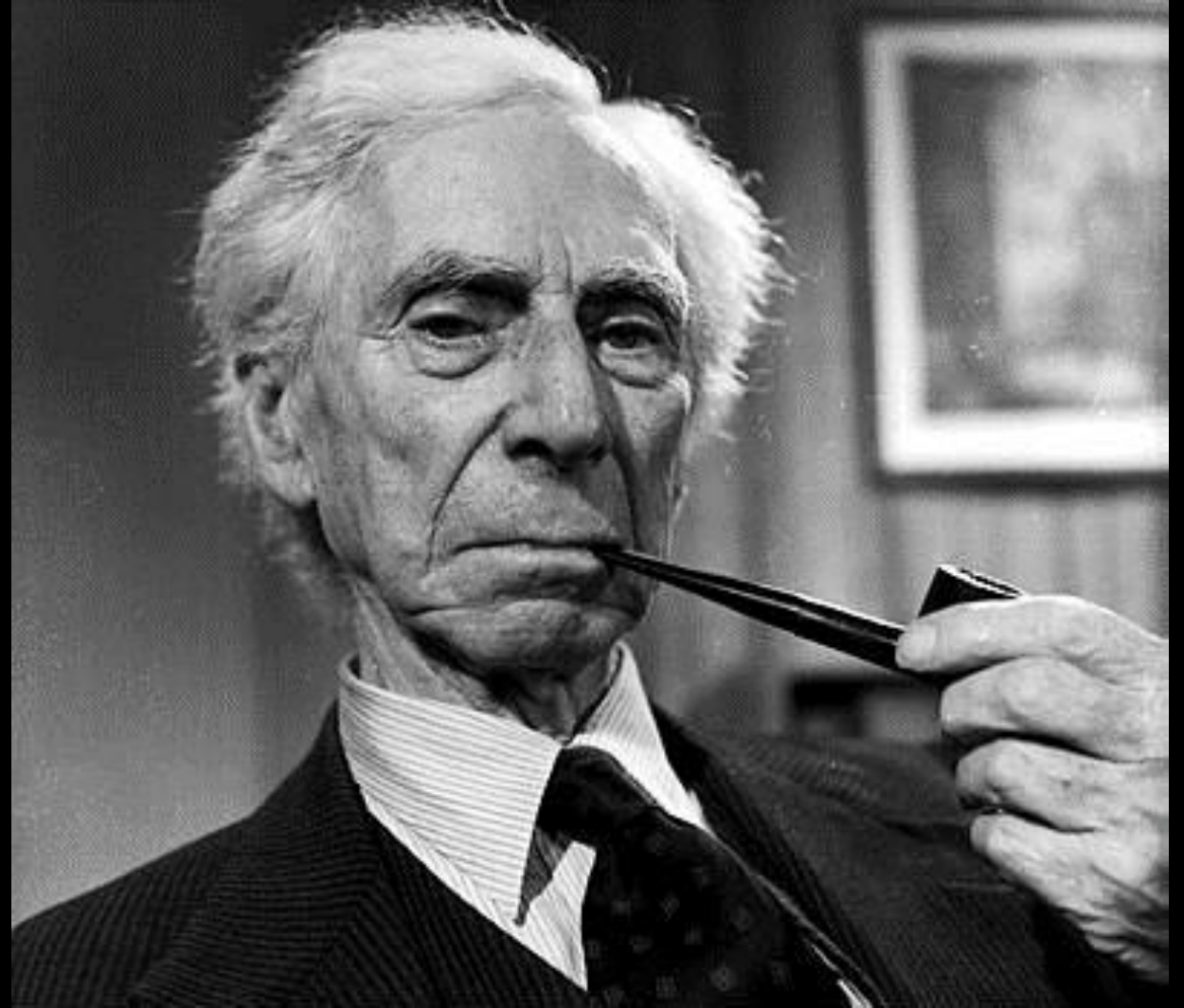

...to electrons in semiconductors.

The next decade should bring control over several qubits and, without any doubt, we shall already begin to benefit from our new way of harnessing nature.

UNIVERSITY OF CAMBRIDGE

Principia
Bertram Russell

Is the set of all sets which are not members of themselves a member of itself?

We are stardust, we are golden and we have to get back to the garden.

-Joni Mitchell

https://www.youtube.com/watch?v=93rSXA8aeG4

How We Became Posthuman
N. Katherine Hayles

In the progression from Turing to Moravec, the part of the Turing test that historically has been foregrounded is the distinction between thinking human and thinking machine. Often forgotten is the first example Turing offered of distinguishing between a man and a woman. If your failure to distinguish correctly between human and machine proves that machines can think, what does it prove if you fail to distinguish woman from man? Why does gender appear in this primal scene of humans meeting their evolutionary successors, intelligent machines? What do gendered bodies have to do with the erasure of embodiment and the subsequent merging of machine and human intelligence in the figure of the cyborg?