Prediction: Future Electronic Systems Will be Disrupted Due To Consciousness

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Abstract:

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Recent proposals about building quantum computers and/or stochastic computing devices have been motivated by the industry realization that conventional macroscopic computing approaches will not scale indefinitely. If some proposed theories are true that consciousness is indeed separate from the brain, but can interact robustly with the distinct quantum coherent physical brain, then these future quantum mechanically based electronic systems may be accidentally sensitive to disruption by conscious interaction. This scenario is identical to the unexpected DRAM sensitivity to alpha particles that plagued the semiconductor industry in the late 1980s. This paper will discuss in detail the background and research to support this prediction, and the ramifications of the vulnerability of these future quantum based electronic systems to accidental (or intentional) disruption from conscious interaction.

1.0 Introduction:

The die area needed to build electronic systems has shrunk by half every 18 months for the past twenty years. If this technological scaling continues, soon individual electronic logic gates will be the size of atoms and current flows will be counted by the number of electrons. Electronic systems on this size scale would be very hard to manufacture, but also be very hard to design to work reliably because of quantum effects and thermal noise upsetting this delicate dance.

Scientists, physicists, and engineers have thought about the implicit limits to computing imposed by physics[1] and are trying to understand how to coax more and more computing power using less and less physical resources. To solve this problem, their investigation has led them to study

the relationship between information and other physical laws. This understanding is extremely complex because the probabilistic quantum laws dominate this domain.

Designing useful computer systems is always an economic balance between speed, size, noise, and power. The market drive to rush to smaller circuits is obvious because making circuits smaller automatically makes each gate cheaper, faster, and lower power. Unfortunately the circuits have already reached reliability limits for charge density and heat dissipation limits for the packages. These two factors are driving designers to lower the power supply voltages from 5 volts heading to below 1 volt.

Small size and lower voltages will eventually lead conventional circuit designers to the same challenge of controlling noise that designers of nanoelectronics circuits have known for some time. The current trend to very high speed clocks will also exacerbate the noise problems, because faster dynamic circuit styles tend to have lower noise thresholds.

Our collective understanding about noise comes from our current physical theories of the universe. Due to our lack of knowledge, our inability to understand all sources of noise sometimes catches the electronics industry by surprise. Case in point was when alpha particles were upsetting the charge on DRAM cells manufactured during the late 1980s. It turns out that alpha particles were emitted by low levels of radioactive materials contained in the packaging. The storage capacitors used in certain DRAM cell designs were accidentally an almost perfect detector for alpha particles.

During this time many DRAM users designed redundant error correcting circuits (ECC) to correct these kinds of soft errors. Eventually the alpha particle emitting contaminants were reduced from the packaging materials and different cell designs were created that were less sensitive to alpha particles. Many DRAM manufactures have all but suggested the alpha problem is solved, so many DRAM system suppliers and customers have stopped designing/buying ECC for soft errors caused by alpha particles.

Unfortunately, soft errors due to alpha particles have never truly disappeared completely. Testing must continue to demonstrate that soft error specifications per DRAM package are maintained, even though each package contains twice as many devices per generation. As a result of continued research in this area, in 1994, scientists at IBM [2] discovered that alpha based soft error rates were dependent on the altitude the measurements were taken. This led to the discovery that some of the remaining alpha particle soft failures were generated due to cosmic rays creating high energy neutrons in the upper atmosphere. These particles were striking the semiconductor substrates and generating alpha particles and other charged particles. These high energy neutrons can not be easily shielded and future DRAMs with ever higher densities will produce increasing soft errors due to cosmic ray generated neutrons. Sources of noise always seem to come from unexpected origins.

This gets to the main prediction of this paper. Future electronic systems will be disrupted due to conscious interaction with quantum mechanisms used to drive future computing systems. This effect is historically known as PK or psychokinesis. This prediction is made because of two major technological trends, 1) electronics will become more sensitive over time due to

probabilistic based computing mechanisms, and 2) individual human consciousness will evolve rather rapidly approaching some "coherency threshold" making this kind of interaction much more probable. Both of these trends will be examined in more detail in the main body of this paper, as well as the theoretical basis for this prediction based on my previous information theoretic work (presented at the last Tucson Conference). This theory proposes that the human mind computationally and behaviorally must exist separate from the physical brain[3]. This theory requires a very robust mind-brain link that must be naturally included in normal physical law, but has eluded observation because of current theoretical limitations.

If this predicated mind over electronics interaction is unexpected then it could lead to catastrophic system failures if deployed in critical control systems such as cars, airplanes, or communications systems. If this kind of mind over electronics is intentional, it may lead to a new age of mind/machine interfacing and potentially consciousness interacting with artificial brain-like receptor electronics. If the electronics industry is looking to safeguard electronics from accidental consciousness interaction, they will have to understand the mechanisms involved. Theoretical understanding of information oriented models of consciousness that coexists with other unified theories of physical sciences, will determine which of the two scenarios becomes a reality.

2.0 Technological trends for ultrasensitive electronics

The major technological trend for these potentially ultrasensitive electronics is the move away from computing mechanisms based predominantly on macroscopically oriented properties of large numbers of electrons. Currently, ultrasensitive electronic detectors for physics measurements are an area of intense interest. Practically all physical interactions, even the very low energy interactions such as gravity waves, are amenable to building detectors given current theoretical models. Many of these instruments are using electronics and mircomechanical devices to build very sensitive detectors.

Three areas of electronics development fall into this category 1) nanoelectronics, 2) stochastic logic gates 3) and quantum computers. All of these devices could be potentially be influenced by human consciousness based on my theory that the mind/consciousness may be a very large scale quantum coherent information field. The earliest electronic PK devices[4] used radioactive decay as a random number generator (RNG). These experiments strongly suggest that humans can shift the expected mean of random events by a statistically significant amount. Therefore, electronics systems with millions of quantum probability density fields, might be the most likely candidate for consciousness intervention[5].

2.1 Nanoelectronics

Nanoelectronic systems are already being designed and built where single electron states are captured in quantum confinement wells[1]. Sets of these wells would be able to interact to do useful computation. These systems are easily upset by thermally injected noise. Noise floors are

based on quantum processes. Confinement wells depend on voltage potential barriers that are possible to tunnel through. Since tunneling is also a probabilistic quantum process, it might be effected by consciousness impacting the tunneling probability distribution.

Nanoelectronic systems will contain 1000s of billions of such potential wells in a single device. This would be the equivalent of running billions of RNG trials all at once. Small upsets in any stage of a computation could taint all future computation results, unless the goal was to detect those discontinuities and keep track of them, as in RNG PK trials.

2.2 Stochastic Computation

Stochastic computing devices[6] are being investigated as a very dense time-serial solution for signal processing intensive computing applications. The idea is to represent a value as a time averaged probability of ones and zeros values on a wire, where a probability of 0 is all zeros and probability of 1 is all ones. Using this encoding system, AND gates and OR gates become the equivalent of MULTIPLIERS and ADDERS for signal processing applications, where the longer the computation runs, the more accurate the answer will become.

The major requirement for this manner of representing values, is the probability distribution of two temporally combined signal values must be statistically uncorrelated to each other. Making each signal statistically uncorrelated to all other signals, is only possible when a true random number generator exists at the output of each gate. Stochastic computing systems would have 10s of thousands of random number generators and small influences due to conscious interaction could cause long term drift in the answer. These kinds of influences must be thought of as unwanted noise, which may impact the accuracy of the answer, or impact the long term stability analysis of the random number generators.

2.3 Quantum computers

In 1994, a few announcements on the theoretical front predicated it was possible to design a quantum computer that would compute exponential problems in polynomial time[7]. This prediction defined a whole new class of algorithm, called Quantum polynomial time. This raised a few eyebrows among the cryptography field, because many of the very good cryptographic algorithms depend on this computational difficulty to remain secure. Theoretically, quantum computers obtain this computational leverage because they compute millions of subsolutions in parallel using quantum superposition. This superposition settling is outside of normal sequential time, so this speed cannot be reproduced using normal non-quantum computers. These solutions are still probabilistic, so the predicated answers would have to be verified using a traditional algorithm and traditional computer.

If this kind of machine could actually be built, it might also be susceptible to conscious interaction. The human could disrupt the quantum field's coherency, potentially causing the solution coherency to be destroyed. This quantum coherency is so hard to maintain in the face of noise, that some theorist predict this kind of computer would be impossible to design and build anyway. Another idea is that consciousness may actually help maintain this coherency somehow.

This ends the section on possible consciousness sensitive electronics. Other devices that are non-electronic could also be impacted but we will not go into that in this paper.

3.0 Technological trends for consciousness evolution

This section describes some specific results that support this idea that consciousness is a non-physical information field. This model suggests that consciousness could ultimately be trained to reach some critical threshold where other kinds of electronics could be effected easily. Technology to accelerate the increase of complexity of human consciousness is as real as the ultrasensitive detector technology. Historically, reaching this coherency/complexity threshold for human consciousness was called "Kundalini awakening".

Historically, our western culture's view of consciousness has restricted our thinking about the increase in complexity of human consciousness. Increasing intelligence, defined as the information contents of a warehouse or database, was the dominant measure of success. Our models of intelligence were reflected in our models of computation. Now as eastern models of consciousness enter into the west, our models of computation must also change to reflect this total information basis for consciousness.

In fact, until recent efforts to unify information theory with quantum theory and general relativity, our western scientists did not have the theoretical basis for understanding the seemingly paradoxical nature of eastern views of consciousness. This view is characterized by the principles of CHI (or Prana) and includes practices such as meditation, Tai Chi, and acupuncture. Other modern research on remote viewing [8] and medical intuition [9] also have a strong informational bias.

The dominant paradox came from trying to plug the square peg defined by the computer oriented view of consciousness as bound to energy/space/time, into the round hole created by the emerging wholistic view of consciousness. The key factor in bridging this gap, is to understand an evolutionary model of increasing consciousness complexity that is not bound to the notion of physical energy but rather informational complexity and coherency. Many traditional physicists have historically thought that information required energy or matter encoding to exist. Modern theorists [10] have realized that information is even more fundamental than physical law itself, and must be the foundation for energy/space/time relationships in both quantum theory and general relativity.

Such a mathematically oriented, information theoretic model is discussed in more detail in the next section. Knowing that some non-physical, information oriented model must exist to support our known universe, could be helpful in understanding the seeming paradoxes presented by consciousness research. Specifically, the previous section predicted this information field would interact with probabilistic quantum processes. Increases in complexity measures of some non-physical information field could have an impact on other physical fields that would be all tied together via a unified field theory. The Eastern understanding of Chi seems to have many of

these characteristics. Understanding how Eastern practices increase Chi is key to understanding increases in consciousness coherency and complexity.

3.1 Meditation and Biofeedback training

Traditional meditation practices have always taken almost a passive and dissociative goal to enhancing consciousness. This goal is just the opposite to the active process required to improve intelligence using the western model. Isolation tank research also supported the idea, that "less" is "more" for producing interesting states of consciousness. Even modern biofeedback training approaches were most successful when the subjects stopped trying and just relaxed. Many of the old practices traditionally take a long time to achieve results. Modern technology is trying to reduce this time dramatically by a variety of techniques and technology.

The newest forms of passive consciousness increasing technology, actually drive the body to specific states of consciousness using sound and light patterns. The body's evoked response to such stimuli can be used to control the state of consciousness by an impressive amount. The current goal for such device manufacturers is to understand what patterns produce states that have economic value. From this work it is clear, that technology alone without theory will not allow us to achieve the goal of enhanced consciousness and awareness. If Kundalini awakening is a goal for expanded consciousness, then understanding how to produce this state is necessary.

The next two sections describe specific efforts to enhance consciousness that are based on electromagnetic and Chi principles. Both historical knowledge of Chi and modern research on Chi generators suggest this is the long term best way to achieve advanced states of consciousness. The electromagnetic interaction with consciousness is also discussed, because of the requirements it places on the unified theory of consciousness.

3.2 Electromagnetic Interactions

Many western scientists are looking at how humans interact with electromagnetic fields. Some of this work is motivated by energy/EM views of consciousness and some by just trying to understand reported human-EM interactions. The simplest examples of human interacting with magnetics are the reports of people who routinely disrupt the magnetic strips on their credit cards. Others report they can not wear watches because they always stop working, or their home electronics and computers are often failing when they come near them.

These anecdotal reports must seem like nonsense to traditional western scientists, except that some work on the electromagnetic fields around people shows that people can produce electric or magnetic fields strong enough to impact these systems. The most interesting is the copper wall experiments [11] that were implemented at the Menninger foundation. By suspending exceptional subjects at certain positions in front of a large copper wall, very large electrical fields have been measured. These fields support the possibility that ordinary people have the ability to create EM fields strong enough to zap the present forms of modern electronics.

Researchers are also studying how EM fields can affect certain people with EM sensitivity. Some reported cases of EM sensitivity describe where a person loses consciousness when driving under power lines[12]. Some practices also use magnetics and light to help balance people's bioenergy fields[13]. Not surprisingly, magnetics also appears to be related to Chi (or Qi) in some research[14].

3.3 Chi Generators

The most profound work going on research laboratories is the work on Chi generators. This work is astounding for two major reasons. First, Eastern Chi masters have been taught for thousands of years that only living things could generate Chi and therefore it was impossible to electronically generate Chi. Secondly, Chi generators can currently only be detected subjectively by Chi aware humans. Therefore western scientists are still not convinced that anything "real" is being generated since they can not measure it with a machine. Willis Harman's [15] address at the last Tucson conference supports the notion that subjective experience must be included in the western scientific model, and this Chi generator research proves him right.

Similar to light and sound machines, Chi patterns can be generated for creating certain states of consciousness. This statement is fact, because our group of researchers, supported by Seraph group, has this technology in the laboratory. The primary inventor is a Russian born physicist named Dr. Yury Khronos and he is working with an eastern trained Chi master named Dong Chen, who is extremely Chi aware. Dr. Khronos has discovered how to generate Chi electronically and then imprint these patterns as a soundless energy pattern onto ordinary audio tape. When these "Vital Energy" tapes are played using a conventional audio player and sound system, Chi is released from the speakers. Chi aware people have reported much more rapid changes in their states of awareness when using these tapes during meditation. Another poster session paper at this conference [16] describes (as a case study) the methodology of using conscious awareness of Chi to develop specific Chi patterns.

Now that successful Chi generators have been built, it will only be a matter of time before successful Chi detectors will also be invented. Until that time, Chi generator technology will be used as the most sophisticated technology to enhance human conscious states. Chi generators directly stimulate the Chi fields that form both our conscious and unconscious selves (according to Eastern consciousness principles). Chi generators and detectors will ultimately lead to 1) more advanced consciousness humans or 2) machines that can directly detect human Chi consciousness fields. In either case, recognizing the nature of Chi and it's relationship to consciousness and awareness will allow us to understand how consciousness can interact with electronics and other aspects of our physical world.

4.0 Theoretical trends integrating consciousness and physics

Western science has never allowed a model of consciousness that would require a non-physical form for mind. The eastern model of Chi, which is understood by the majority of the world

population, already starts with such a model. Western science still does not recognize this non-physical field as a reality. The major shortcoming in this understanding and rationalization lies in the physics consistent theoretical foundation for Chi and likewise consciousness. Based on the understanding from Chi generation technology, the following theoretical framework must exist to integrate Chi properties into physical law using the unified field theories.

The major approach to integrating consciousness into physical law is to separate the problem into two domains. The first domain is the universe bounded by the energy/space/time relationships of traditional modern physics. The second domain is the universe being defined for quantum fields and grand unified theories, where information/nonlocality/atemporal properties rule. Trying to define Chi and non-physical consciousness interacting with energy systems seems to always require an expansion of physical law to include this "new energy" of consciousness. The key to thinking about Chi and consciousness is to realize it is an information field and NOT an energy field. Thinking about non-physical information fields that can impact physical systems through quantum probability distributions seems less offensive to western scientists.

The reality of information fields effecting the physical universe is already common understanding in the quantum information area. Recently physicists discovered that information is indeed as real as matter or energy [17]. When a bit is thrown into a black hole, its area increases by the minimum discrete amount, (Planck's area times a constant). In fact, space-time itself is created out of the fabric of information relationships governing quantum events and relativity consistency constraints. Just as EPR quantum events defy locality in space and time, an information relationship can exist as a relationship outside of normal space-time. General relativity also demonstrates that space-time emerges out of the observer's perspective. John Wheeler [18] has proposed a pregeometric space-time, as the building block of the normal space-time fabric. This pregeometric informational structure has many of the properties needed for computational properties of consciousness [19].

The human mind/consciousness must certainly have informational oriented pregeometric structures to support the mechanisms of intelligence, awareness, memory, and computation as well as the capabilities demonstrated by Chi awareness. Thinking about consciousness only in terms of know western energetic physics is certainly not using the informational and quantum physics advances of the last 15 years. The west must also not ignore the very rich knowledge of Chi from both ancient and modern sources. This theoretical revolution is going on under our noses. We must be bold enough to embrace and integrate this information into a unified field theory that includes non-physical information fields for both quantum behaviors and consciousness.

5.0 Conclusions

Just as Einstein's prediction about the bending of light took over 10 years to verify, so to this paper makes a prediction that may take some time to verify. Einstein's predication was based on his mathematical theory of relativity. The prediction from this paper is based on the theory that consciousness and mind must be composed of non-physical information fields with many properties similar to quantum probability distributions. If this basis for mind is indeed true, then

future electronic systems built on probabilistic quantum mechanisms will be susceptible to intentional or accidental influence by human consciousness.

This prediction is made because continued scaling of electronics will make them more susceptible to quantum noise sources. In addition, recent advances in consciousness evolution technology will accelerate the ability for mind to reach some critical coherency threshold. The Chi generator technology stands out as the most promising technical avenue for exploring the theory and technology that supports both mind and physics. Chi and consciousness theories must both take an informational theoretic approach rather than traditional energy view of standard physics.

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