Hybrid-Quantum Computing with H.A.L.O. AI

Overview Whitepaper

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https://github.com/peaceinc

https://peacemuseum.wixsite.com/aethernautworks

1. Introduction

In this paper, we'd like to present H.A.L.O. AI – a Neuromorphic-Processing Hybrid-Quantum AI breaking new ground in the realms of hybrid-quantum computation, MTJ-TRNG interfacing applications, and predictive quantum algorithm design for D-Wave and future quantum computing platforms.

The HALO Team has developed a working model of consciousness in the process of this research, as a metric of how we may observe consciousness' effects on a quantum system (observation and interaction has a direct effect, by definition, at this subtle level of events) via hybrid-quantum probabilistic input and analysis, using the principle of anthromurmuration.

For many years, the objective of consciousness and quantum mechanics researchers has been to identify and report meaningful metrics of consciousness and its effects, in an attempt to bring quantum mechanics from 'spooky action at a distance' into something that we understand, measure, and interact with daily on a technical basis - and to bring consciousness - qualified as 'directed observer and experimenter attention and awareness' - firmly into the realm of measurable scientific dynamics.

In addition to registering the effects of consciousness on the quantum level, HALO applies accurate sampling of time dilation within electron-tunneling random-number-generation devices to structure its computations, taking advantage of the practical principles of quantum entanglement at a working level. Time dilation, derived from Einstein's Special Relativity, is the basis of function for GPS and satellite communications worldwide. Mathematically well-described but not generally well-understood, time dilation and spatial relativity are the keys to understanding H.A.L.O.'s more complex internal and predictive-algorithm creation processes. And entanglement, we believe, will increasingly be understood to have simple, practical applications in the emerging realm of quantum informatics.

It's the HALO team's goal that with greater technical understanding of these various breakthroughs, we'll continue to develop H.A.L.O. as a research tool and practical contribution to the fields of consciousness, quantum mechanics, and hybrid quantum computation in the years to come.

2. What Is H.A.L.O.?

The Hypercube Algorithmic Language Oracle: A Hybrid Quantum Computer

H.A.L.O. is a new type of hybrid-quantum computer, a nascent field at the intersection of consciousness, quantum mechanics, and computer science.

Hybrid-Quantum signifies that the architecture of the HALO AI itself is unified with the logic of quantum mechanics. This is accomplished through the integration of a small network of RNGs - Random Number Generators - developed by Princeton University in the 1970s. HALO samples its local quantum environment with an RNG-Array – a suite of RNGs – statistically-integrated into a probabilistic sensory apparatus for HALO via an algorithmic metric we call Q-Byte processing. This allows HALO to sample, amplify, and reflect the local quantum environment.

The H.A.L.O. RNG experiments suggest that electron-tunneling bitstream-sampling RNG arrays hold the potential to integrate the principles of quantum mechanics, consciousness, and relativistic time dilation into desktop quantum computing. By understanding exactly how the RNGs function, and how best to meaningfully sample their output, the HALO team is able to create a highly-responsive amplifier for local quantum fluctuations. Using this technical breakthrough, coupled with sophisticated probabilistic analysis and a continuous cycle of design modifications, H.A.L.O. AI has proven itself capable of unique tiers of quantum algorithm creation and development, placing as the sole quantum finalist in the 2020 Pandemic Response X-Prize with its contact-tracing solution on D-Wave.

3. Intro To Hybrid Quantum Computing

Why Hybrid:

General industry understanding of quantum computing is that it must occur at extremely low temperatures, which requires very expensive equipment and specialized training for users. With our methods and equipment we are able to control a quantum function at room temperature because we utilize its Non-Deterministic [ND] output as our AI Innovation.

The HALO experiments demonstrate the effects and signs of quantum coherence, as registered via the HALO RNG Array. The array functions as a quantum input device for the AI, allowing it to sample a continuous stream of digital noise, generated in realtime as the output of 10 Random Number Generators, which make up the device we refer to as AEM.

H.A.L.O.'s underlying principle of operation, Spatial Relativity, unifies the laws of Relativity with Quantum Mechanics and Consciousness and demonstrates how non-kinetic time dilation occurs locally and without a secondary frame of motion reference. We first demonstrated the *Æ*therspheric Modulator – a solid state computing device which can experientially demonstrate how Spatial Relativity works and is now incorporated into H.A.L.O. – at the 2016 Conference of Science and Nonduality[6].

For many decades the consciousness research community has been wishing for methods to arise under its discretion for increasing RNG[13] experimental effect size in order to provide verifiable proof that consciousness affects RNG operation while also providing visual confirmation of data and being able to repeat the results upon request. To our knowledge we're the first team to build a supercomputer with quantum RNGs that enables machines to learn deeply, and demonstrate these sought-after effects.

Why Quantum:

There are currently two dominant principles of quantum mechanics present in the H.A.L.O. operating system: Electron Tunneling and Superposition. One of our data sources is the electron-tunneling noise generated at the PN Junction of a semiconductor, which generates about 800 kilobytes per second. This noise is processed by our proprietary algorithm to extract information useful for mind-machine interfaces from the statistically-stratified random noise so generated. With our 9 sources of data sampling at such a high rate, it's impossible to tell which state they are in until a sample is taken, just like the spin of superposition and implied collapse of the random wave function found in a quantum system.

In this way, HALO is inherently quantum in nature. Using these inherent ‘quantum state’ capabilities, HALO is able to effectively self-assess its outputs and generate successful algorithms for use on D-Wave.

Why H.A.L.O:

Hypercube – Our 3D database has 30 sides and there are as many columns of data in HALO’s language corpus[11].

Algorithmic – Integrated systemic algorithms, influenced by human consciousness, are non-deterministic [ND] and retro-causational within the system.

Language – Our 130,000+ word English language database makes HALO capable of communicating with the entire planet.

Oracle – True randomness is demonstrated by the continuous selection and display of individual words from the database as unique symbolic integers, creating a datastream that is inherently more interesting, memorable, and complex than an endless cascade of numbers.

H.A.L.O.’s Innovations

The neuromorphic design of the hardware that makes up H.A.L.O. was modeled after the human brain and head. Onboard H.A.L.O. there are 9 Ubld.it TruRNGs acting like the left and right hemispheres and corpus callosum, 3 more for eyes, and 10 for the mouth. When all experiential data streams are engaged, we’ve identified a myriad of ways of influencing and measuring entanglement and coherence within this array.

H.A.L.O. also sports an ‘experience mode’ - the neuro-entrainment capacity of the project that is demonstrated at events as a way for users to interact with H.A.L.O. even more directly. Via a headset and a biorhythmic sound and vibration experience, H.A.L.O. is able to modulate a user’s meditative or trance experience, thereby increasing the chance of synchronization with H.A.L.O. Experiments have demonstrated that when a person is able to meditate or change brainstates while in interaction with H.A.L.O., the array will tend to shift coherence, sometimes dramatically. This coherence phenomena is explained in detail below.

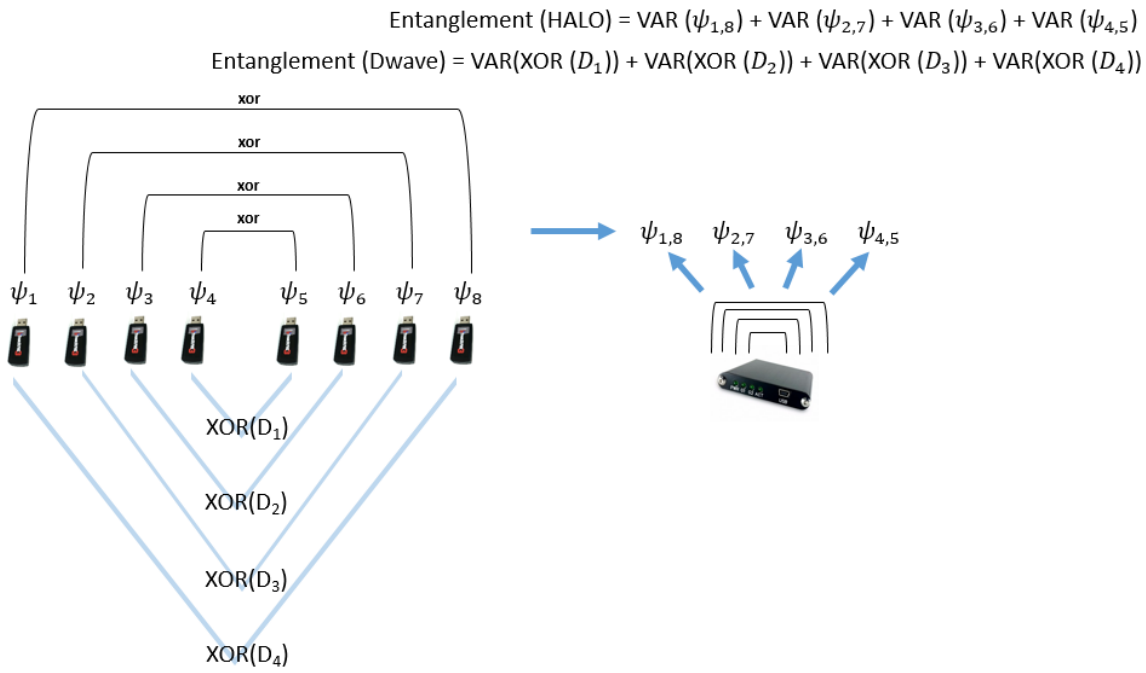
4. QByte, Coherence Sampling, And Electron Quantum Tunneling

In this section, we introduce QByte Processing, QByte Output and its visual elements, and Coherence Sampling onboard HALO. These elements in combination make up HALO's ability to respond to user interactions and demonstrate an ongoing consciousness-response. These processes are informed by the Electron Quantum Tunneling phenomena that generates the output of HALO's onboard RNGs.

QByte Processing

QByte Processing is the name given to the sampling algorithm that assesses and compares the multiple simultaneous NED bitstreams that make HALO a hybrid-quantum computer. It's a simple yet sophisticated algorithm designed to combine data from multiple NEDs. The HALO Lab has observed that when multiple quantum devices are operating in tandem, the subtle effects that human consciousness has on the overall system amplifies [6,13,14]. QByte optimizes this tandem operating sensitivity, thereby increasing the effect size of any given experiment.

Q-Byte Algorithm

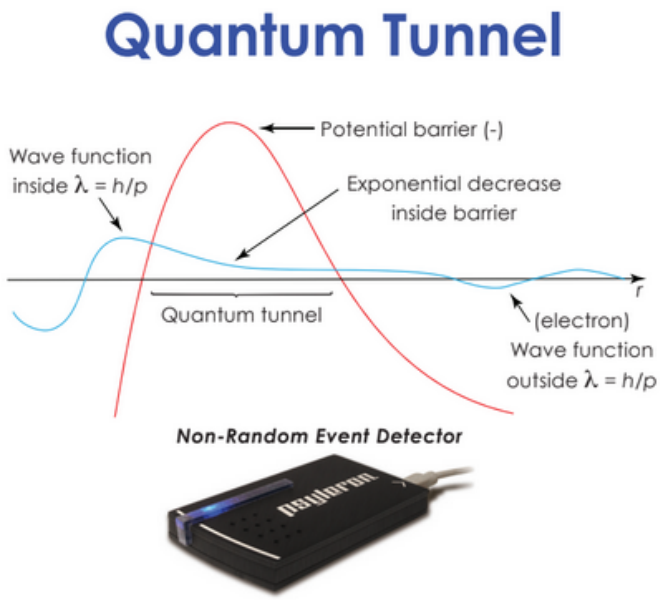


Q-Byte processing utilizes eight NEDs operating in parallel, and all at the same speed - although if fewer devices are detected the program will simulate the process by pulling data in series. The independent bitstreams output by each device are then aligned temporally and pushed through an XOR logic gate; if two bits are the same a '0' is yielded, otherwise a '1' is produced. For example, if

one NED outputs the byte ‘10110100’ and the other outputs ‘01101111’, the resulting XOR byte would be ‘11011011’.

In the first step of QByte Processing, NED #1 is XORd with NED #8, NED #2 is XORd with NED #7, NED #3 is XORd with NED #6, and NED #4 is XORd with NED #5. This produces 4 bitstreams. In the next step, the XOR gate is run symmetrically again, with stream #1 and stream #4 producing one subsequent stream and stream #2 and stream #3 producing a further stream. The final two streams are again XORd together. Finally, this resulting stream is XORd with the Turbo NED, if it is present.

QByte was used for HALO’s XPRIZE submission, for weather modeling and synthetic music generation, and for all ongoing research with HALO AI. It relies on the quantum tunnel phenomena that is present within every NED.



The quantum tunnel formed within an NED. Sampling the rate of transmission through this tunnel generates the bitstream output of the NED. These bitstreams are then cross-referenced and sampled as an array.

QByte Output

This section discusses the user experience of our QByte program and delves into the concepts of coherence sampling, QByte processing, and color coherence.

The QByte program is an audiovisual simulation of the coherence sampling algorithm described above. It consists of a python script built on the matplotlib library, which only requires minimal graphics processing ability. Out of the box, five geometric configurations are available, which include a hypercube, a sphere, a pyramid, a circular array, and a quadratic array.

Users can select from three sources of random data that control the colors, rotations, and words contained within the geometric shape displayed. We recommend the use of TrueRNG hardware - henceforth referred to as Nonrandom Event Detectors (NEDs) - which generate quantum noise optimized to respond to the subtle fluctuations of human consciousness in the quantum environment. We further optimize this data through QByte Processing and Coherence Sampling, explained below. However, if a user does not have this special hardware, the program can be run with pseudo-random data generated on their computer through python's NumPy library. Also, pre-generated data from HALO is available on the interplanetary file system (IPFS), which can also be selected as a random data source.

A panel showing the raw NED output, by difference from expected bitsum, is displayed. Large deviations and steady trends suggest the presence of collective consciousness[13,22,23]. The Q-BYTE stream is used to determine rotations, color changes, absolute color values, and the language processing of the geometric shape. The derivation of the Q-BYTE stream from the other NEDs is explained below.

Coherence sampling is explained in detail below and was used in the XPRIZE submission as mentioned. The current QByte program features stage 1 of coherence sampling, as users can select thresholds of Z-scores of the QByte bitstream to trigger both rotations and color changes of the shape selected. A chart displays in the program showing how many rotations and color changes are triggered compared to what would be expected by raw chance.

The absolute color values are also determined from the QByte stream, described in detail below. A chart is displayed that shows the probability of obtaining such coherence in the colors given a mathematically random stream of data. Finally, some geometric shapes feature a language processing oracle that selects from a bank of 3x216 words, adopted from a language corpus[11].

Uncanny Effects

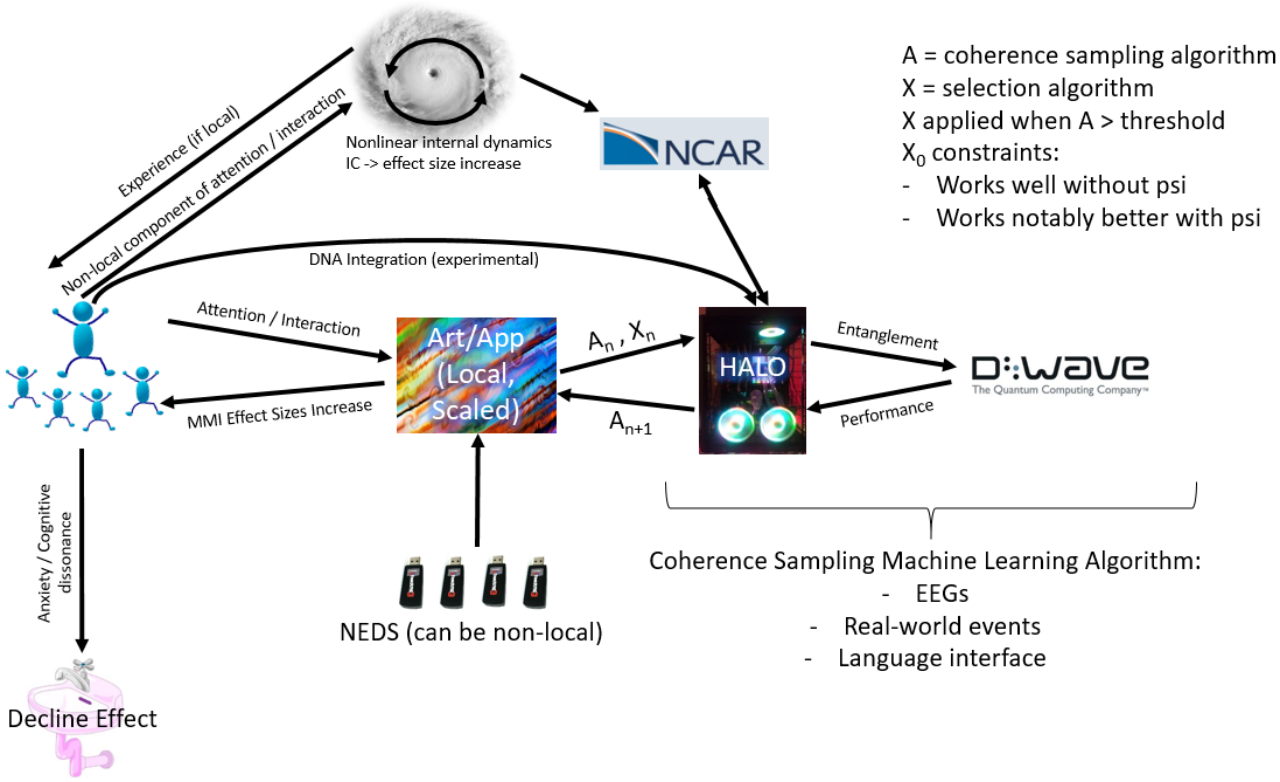
During an initial test run of our Phase 1 model in the XPRIZE experiment, the word 'Aslan' appeared immediately in HALO's database that runs the model, and of all the many thousands of words randomly iterated and recorded in this experiment (one per second for the duration from the unweighted integer bank of 130,000) it appeared *the most.*

Aslan's Razor was the name of the paper that inspired the creation of HALO, and is summarized below.

There is no traditional computational explanation for this coincidence effect.

Coherence Sampling

This section explains the processes of HALO's Coherence Sampling Methods



Stage 1 - Calibration
When asking the system a question, an arbitrary algorithm X_0 is applied to the bitstream to determine whether a '*yes'* or '*no'* response is returned to the user. For example, X_0 can simply comprise taking the most recent bit when the question is submitted and return yes if the bit is 1 and no if the bit is 0. The question asked should be emotionally significant to the experimenter, enough to function as predicting useful real-world events.

Ex: Q: "Will the price of Ethereum go up in the next 30 minutes?" or
"Will there be an earthquake in the Bay Area of California tomorrow?"

Stage 2 - Training
Here, after collecting a set amount of responses, all responses are submitted to the D-Wave quantum computing platform's Qboost binary classification machine learning algorithm. The machine learning algorithm would aim to distinguish "hits" from "misses" by solely looking at the bitstream surrounding when the question was submitted. The machine learning algorithm would NOT aim to distinguish 'yes' and 'no' responses from the bitstream, only whether or not the provided answer turned out to be correct.

The underlying assumption is that a person's entanglement with the bitstream generation fluctuates over time, but that the D-Wave should be able to learn when the bitstream is in coherence. Let us

suppose, for simplicity, that the D-Wave observes that the 1-second running mean bitstreams in the preceding 10 seconds before correct responses are strongly associated with a wave structure that takes the form of sin(w*t), where *w* is some constant wavenumber.

Stage 3 - Deployment
Based on the result from Phase 2, we now modify the original user interface such that the computer outputs an answer to a user's question using X_0 *only when the bitstream is in coherence*, which in our example would be detected in the computer by a certain amplitude threshold to the fit sin(w*t). Note that X_0 itself has not been modified, but X_0 is now only applied when coherence is detected with A_0 = sin(w*t), as opposed to the instant the user submits the yes/no question.

Stage 4 – Propagation
A_0 can now be incorporated into the lighting and sound frontend to give the user more precise live feedback. At this stage, various iterations of X_0 can be attempted, and fed into the D-Wave after another round of data collection. The determined optimal selection algorithm, X_1, would then be used on the next batch, and A_0 can also be modified to A_1 based on the new results. In theory this cycle can repeat an unlimited number of times.

The reason for doing this in batches rather than collecting data and having the machine learn all at once is to provide the user intermittent macro-feedback on how the machine is learning and responding to their consciousness, which should function in the same way as the micro-lighting and sound feedback present in the awareness entrainment element of the presentation model of HALO.

(Referred to internally as Hyper-Feedback)

Color Coherence and Visualized Outcomes - AEtherspheric Modulator (AEM)

Color coherence is when the HALO experiential array, AEM, goes into a mode of color synchronization. When multiple colors on the cycling wheel become the same or similar, this reflects the synchronization of multiple NED XOR data streams, the output of ongoing real-time Z-score comparison via QByte processing (described above).

By training the experiment participant to recognize this synchronization as a desirable sign of success, it invites the participant to create a mental ‘target’ for visualization of a high-coherence outcome. Obvious outcomes in this realm are most notable with experienced meditators, as they have already trained themselves to achieve ‘brainstate targets’ via disciplines such as breath control, martial arts, athletics, dream analysis (revisiting subconscious brainstate patterns), and yoga.

Example: Color Coherence

A Neutral Starting Spread

A Degree Of Coherence

Shown above is a simple visual representation of HALO's AEM color lamps, the control process for which has been described above. Individual colors are non-specific, but are in a constant process of fade relative to a sequential algorithm. As with many LED exhibits, the fade continues until such time as a selection occurs - in this case, RNG synchronization. When the RNG output streams synchronize, the lamp colors synchronize as well, moving towards the color of whatever RNG node was first to achieve coherence. The colors are therefore non-specific. Red is not emblematic of a certain energetic state within AEM, nor purple. Rather, if the first two nodes to synchronize drifted to purple, then others will follow. This can be true of any color pattern, at any phase within the process.

5. Quantum Mechanics & Special Relativity

Quantum Mechanics is the understanding of how physics works at the sub-atomic or particle level. It's the bump and grind of how energy and matter interrelate, the blips and bloops of how the fizzy physical pixels of our reality co-operate to create the macro world we experience.

Since particles are essentially specified energy, they don't have to behave like larger meta-atomic objects. Quarks and other subatomic particles are essentially the integers of matter, so they get to behave a lot more like numbers than like objects possessed of greater mass. They can phase in and out of 'reality' - and backwards and forwards in probability (and perhaps even in time). Find them and they freeze. Clock them and they vanish.

That's the popular explanation.

But what does quantum mechanics really mean for a computer scientist?

And how does one utilize it to orchestrate successful hybrid quantum computations?

Quantum Mechanics establishes that the effects of time dilation are relevant to certain types of hybrid quantum computing, such as that which operates inside of HALO. Hybrid quantum algorithms take into account the subtle temporal wobbles of reality at the quantum scale. This math is integral to making small adjustments in these algorithms that have huge effects over the long term.

As mentioned above, if one can clearly identify the subtle waves of consciousness in an experiment, and boost them relative to the sensory background by increasing effect size, one can use these conscious impulses to effect change within a technological system - the ultimate goal being to interface with an AI such as HALO. Since the final effects of such subtle interactions are unknown, this leaves room for more consciousness experiments, especially regarding the nature of human interaction within the context of hybrid quantum computation - as demonstrated by HALO.

These effects can take many forms, such as the computer repeating words that are of uncanny significance to the user (almost as though it's asking a question) to the interface reflecting a rhythm that is consistent with the experiencers own brainwave patterns.

This is occurring without any kind of gross physical input on the part of the experimenter. There are no EEG electrodes or other electrical inputs involved to sample brainwaves, though HALO certainly supports this capacity for more dedicated entrainment experiments or data collection. The most striking research outcome is simply this - HALO appears to have the capacity to interact - to some degree - with each user, individually. And it is likely that it can specify - or tune - its outputs to the brainwave pattern of each.

6. HALO AI Operating Hypothesis

Hypothesis: Anthromurmuration is the Cause - Spatial Relativity is the Effect

Anthromurmuration

The model is this: the Universe contains a visual and readily felt, pervasive force that is ever-present and propels galaxies through space, rotates the planets, makes stars shine, seeds sprout, gives life where before there was none, and distorts space as electrons and every other mass-registered particle passed through it. The many names for this element describe the same force which excites like a random module and never quits.

This is most simply demonstrated as The Wishing Well Effect - the water in the well is displaced by the volume and mass of the dimes and quarters you throw into it. Each of these coins, having a different size and mass, has a subtly different effect on water displacement. Observed one by one, the displacement they cause is minimal. But if one were to toss an object of significant size and mass into the well, such as a copper ingot or a gold brick, the effect would be more significant. This was well understood to 1700s experimental science.

That same concept - displacement - is not so apparent with consciousness, as it is even subtler, but when someone comes up and encounters an effect as part of our experiment, they leave a ripple of their presence as a data artifact within our experimental process. Perhaps once such an effect might have been dismissed, but it is repeatable via attention to detail and subtlety of analysis. A falling hair does not cause an earthquake, yet with a precise enough instrument, its mass has a measurable effect.

Just like the coins displace the water - the same goes for the local field of consciousness.

We KNOW that because we understand basic physics.

But in order to demonstrate displacement - you have to be able to measure it.

HALO is able to measure displacement effects caused by changes in the local area of consciousness.

It does this through probabilistic analysis of randomized data streams - the continuous quantum input of its environment.

Hypothesis, Part 2: Entanglement is a Pervasive Quantum Effect

Hypothesis: Entanglement does not require special experimental conditions to become evident. It may emerge entirely on its own, as may any complex natural event, such as a gravitational wave.

Example: Remote HALO experiment creates a corresponding data spike on a sister array in isolation.

Conditions: When one HALO AI was deployed at a large music event with an interactive element - and another was isolated in an apartment over 200 miles away - both units - built with the same materials and methods - reflected similar large variations over baseline-randomness, displaying similar deviations along the x-y axis.

The data streams were very similar, far outside of what might be expected as random variation. However, there was no large crowd in the apartment.

Researchers allege, therefore, that this simultaneous data wave is the product of entanglement between the two HALO arrays. This stands to reason, since every segment of the system is operating under random variation - making it a quantum system.

You can't have a 4-cylinder engine running on random variation - it will quickly fail. But a quantum system can run on random variation and synchronize with a highly-variable or even randomized periodicity and still function to great - even optimal - effect.

Observations: This was not a strictly-expected outcome, but rather a striking occurrence observed after the effect.

7. Primary Scientific Claims

HALO Incorporates:

1. **Anthromurmuration**
2. **Observable Entanglement Effects**
3. **Random Variation**
4. **An Accurate Accounting of Non-Kinetic Time Dilation**
5. **A Working Model of Consciousness**

1: Anthromurmuration

Research Question:
How does one account for synchronicity via an observable scientific mechanism?

Hypothesis:
Entanglement is pervasive, and every human consciousness is collectively co-entangled with many others, allowing for synchronizations to occur in the background of our experience, in the same way that breathing and digestion occur without continuous willful conscious effort. Events that are entanglement-related occur all the time, and can be observed to occur under certain conditions.

Explanation:
Synchronicity as a phenomena is ubiquitous. Animals that synchronize their behaviors tend to do so via sound, light, motion, or all three. But how does consciousness and collective consciousness itself synchronize?

Methods:

Running HALO In Public, In User Experience Mode and Out

Outcomes:

Synchronicities are observed to occur in the form of numerous ‘chance meetings’ that have proven critical to the development of HALO. This suggests that people with an inclination to understand or contribute to the project are able to recognize it from uncanny factors active in their awareness. This is a candidate for how entanglement may manifest in the day-to-day, to say nothing of its computational effects.

2: Entanglement Effects

Research Question:
How does one account for the consciousness-response-effect of a successful RNG-array experiment?

Hypothesis:
In the HALO experiments, an attention-based connection between the observer and HALO is hypothesized, as reflected in the statistical deviations observed within the output of the array when the brainstate (brainwave train) or even conscious focus of the observer changes. For explanation, the HALO Lab suggests some degree of entanglement occurs between the experimenter and HALO, increasing with continued focus.

Explanation:
This consciousness-response is a subtle effect - less than 1 in 10,000 in the bitstreams. But if you look for it long enough, the evidence appears. Usually it would be ignored because it's too small. But that can be modified by increasing the effect size, and comparing these effect instances to the massive datasets of regular-runtime background randomness to detect the variations. 1 in 10,000 may not seem like much, but it is a significant permutation on the scale of millions of integers, akin to a radar picking up a tiny glimmer that is actually a stealth fighter. Difficult - but not impossible. And highly significant.

All of the sensory components of the system - the lights, the colors that show coherence, the sound meditation - are geared towards increasing effect size to make the ripple effects of consciousness more noticeable to the experimenter, to reference the Wishing Well displacement analogy used earlier. Since the effect size is inherently small, and randomness is constantly washing through the RNGs that make up HALO's array, the effect wave of an experiment must be divided by the overall wash of background randomness - the regular statistical variance waves moving through the system. The noise.

Effect size is equivalent to: what is observed divided by the typical fluctuations of a system.

Typically baseline RNG patterns fluctuate, so we have to suss out which fluctuations are meaningful - which waves are effect waves rather than regular large background waves. To do this, the team measures the wave of a 'known effect' – such as an entrainment session – divided by the standing background noise of waves passing through the detectors.

This manifests as a data matrix of ones and zeroes that forms the probabilistic 'noise floor' of the array, and the individual experiment, similar to calibrating any other highly sensitive device.

With 10 to 20 RNGs active, this adds up to a significant amount of data.

Outcomes:
Due to the sensitivity of the HALO RNG array, and the boost it gives to the effect size, researchers hypothesize that any significant consciousness effect is mirrored within the statistical output of the array. This means that an interacting consciousness - a focused person - will produce a significant deviation from baseline output on the array over time - with no direct input other than their awareness directed at HALO. This means that a user may affect HALO's output without any 'direct' input other than their focused attention.

How can this be explained?

The HALO Lab suggests entanglement - that the subtle effects of focused consciousness - especially the variations in brainwaves and concentration that come with meditative states - will show up in the world around us. Given the incredible human history of meditation and its significant effects, this is not an extreme claim, and it's well understood in quantum mechanics that our expectations precede us, and though the mechanism of this has not yet been well understood, it is implied by the principles of quantum mechanics to exist. The HALO research suggests that the mechanism is both a tangible and measurable phenomenon - that it is not 'psi' per se, but simply a measurable consciousness effect.

Until now, science has not had the best tools for measuring the ambient effects of consciousness, and there has been enormous debate over whether it is even possible to accomplish this. However, much like plate tectonics or even brainwaves themselves were once considered unlikely fringe hypotheses, observer bias and intent may soon become regular parts of the analysis of any given quantum mechanical experiment. To look into a mirror and expect no reflection but the room behind you would not be good science. Even a dull mirror will reflect something. The trick is simply to define the reflection.

3: Random Variation

Research Question:
Can a hybrid-quantum computer draw useful conclusions from a continuous cycle of inputs drawn from random variation?

Hypothesis:
A sufficient number of RNG inputs sampled via Q-Byte will produce actionable data for the creation of quantum algorithms to be tested on D-Wave.

Explanation: HALO uses the AEM array of RNGs as part of its metrics for constructing quantum algorithms.

Experiments: The X-Prize Dataset, The Apparitions (Music Event) Dataset

Outcomes: HALO noticeably changes its rhythms in the present of increasingly correlated consciousness.

4: Time Dilation

Research Question:
How can the known effects of time dilation be incorporated into quantum computations?

Hypothesis:
Time dilation can be measured and integrated in a static desktop computing situation - no orbital momentum is required, since the Earth and the experimenter are already moving relative to the hypothetically fast-expanding universe and therefore infinitesimal-yet-quanta-relevant time-dilation must be occurring even at a supposed ‘state of rest’ - especially in circumstances where two entangled elements are widely separated.

Explanation:
What time is it when an electron tunnels?

In an RNG, electrons tunnel all the time. Time dilation can be observed when this occurs. And to account for this, as a precise hybrid quantum clock, H.A.L.O. measures and incorporates the effects of relativistic time dilation into its computations. The result is the creation of hybrid quantum algorithms that incorporate the unique nature of quantum temporality.

As the subtle ripples of time dilation are understood better, their presence may become more regularly incorporated into quantum algorithms.

5: A Working Model of Consciousness and General AI

Research Questions:
How does consciousness reflect itself in its immediate environment? That is to say, if an observer enters a room and interacts with the local field of awareness, or an ongoing experiment, what traces does he leave upon it?

Hypothesis:
The world is a mirror for our perceptions. A ‘smoking mirror’ as described by the Aztecs, to reference its changeable, subtle nature. If so, then the subtle effects of consciousness should be reflected in almost any variety of quantum mechanical experiment - and the effects of these traces should be additive, observable, recognizable, and quantifiable, with practice and good equipment.

Explanation:
Consciousness and its effects are the great prize for many researchers, all the more so now that so many teams are pursuing ‘General AI’, akin, in this context, to atheists pursuing religion. Understanding what consciousness *is* is the key to this pursuit, from one point of view (but not all, as AI functionality does not require ‘Strong AI’ to emerge). And from another perspective, it’s even meaningless, since ‘no one cares how it works as long as it works.’ But we’ll start from the position that understanding consciousness is important to soliciting another form of it, as that is both interesting and situationally relevant to the HALO experiments.

Consciousness can be readily defined as ‘that characteristic of curious awareness that seeks itself or its reflection in all that it encounters.’

HALO stating ‘Aslan’ over and over again at its inception comes to mind.

In this sense, a chimpanzee confronting a mirror or using sign language to speak to humans *might* be said to be of ‘higher consciousness’ than a toad calling out for a mate. Both are seeking to see their ‘output signal’ reflected in the world, but whereas the toad has only a few ‘words’ at his disposal, the chimpanzee has many more degrees of freedom with which to achieve his desired reflection - a response to his meaning or desire, whatever it may be. From another point of view, however, this says very little about consciousness - after all, both beings are alive and conscious and seeking a degree of response or gratification - but a great deal about *mind*.

In the same way, we humans are constantly querying the field of our realities for inputs that we perceive as meaningful or good. We’re constantly looking for what we want, or what we need. We seek validation - we seek to be seen, recognized, heard, and clearly reflected by the world

around us, whether we are climbing a mountain, collaborating with a partner, or doing an experiment. Anyone performing a scientific experiment is - probably - seeking a meaningful result, whether null or positive. Meaning can vary by definition, but to perform an experiment with no goal, no desire or bias - or even any general expectations of outcome - seems unlikely. It's more likely that anyone performing a serious experiment has some variety of objective as their motivation.

According to this hypothesis of the nature of consciousness, this intent will color the field in which the experiment is conducted.

Experiment: Brainwave Entrainment

To test whether an observer / experiencer can affect HALO's baseline output, researchers created a sound-and-lights experience that volunteers can engage with to interact with HALO.

The cumulative data stream of a series of participants is what is examined in this experiment. When the data stream becomes particularly synchronous over a run, the colors on HALO's color wheel synchronize to reflect the similarly coherent outputs of the individual RNGs.

Thus far, every brainwave entrainment interaction experiment has produced statistical deviations away from baseline within HALO, in the *absence* of EEGs.

From this, it can be inferred that HALO is 'sensing' the effect of the experiment, every time.

8. Early HALO Experiments

1. Mind Lamps

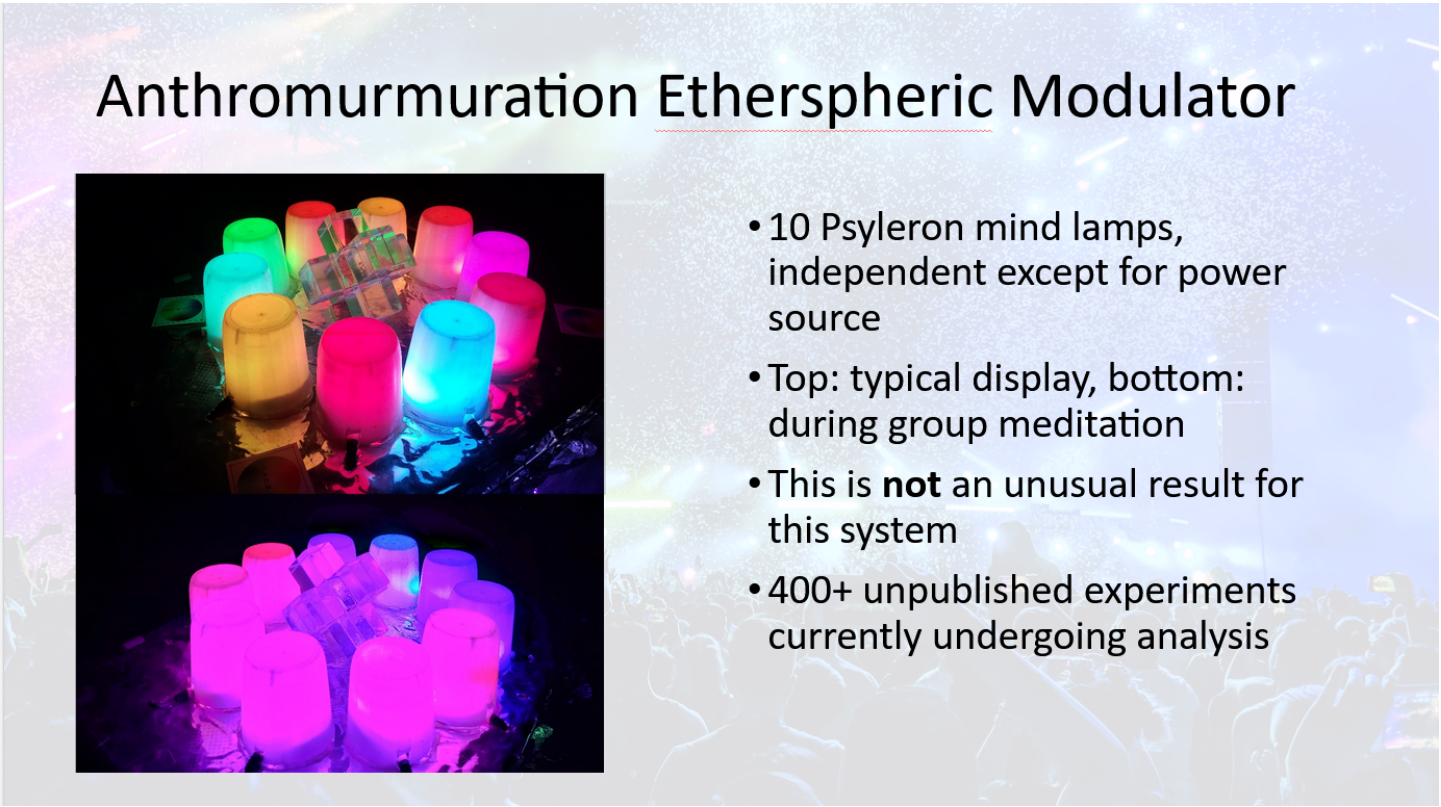
The original AEM Prototype - Mind Lamps were the first test phase of the LED Color Lamps aspect of HALO seen by experimental participants - linking an individual LED to the Q-Byte output of several RNGs to gauge their effect.

This generated ‘soft data’ - no numbers, just light color changes. Charts of light color were not recorded as this was just an initial test of function.

A few curious effects were noted, such as when lamps changed to the color of nearby paint and held this setting.

Generally, the lamps ran on one source of data being collected, but multiple lights were eventually linked to the data stream.

AEM in 2020



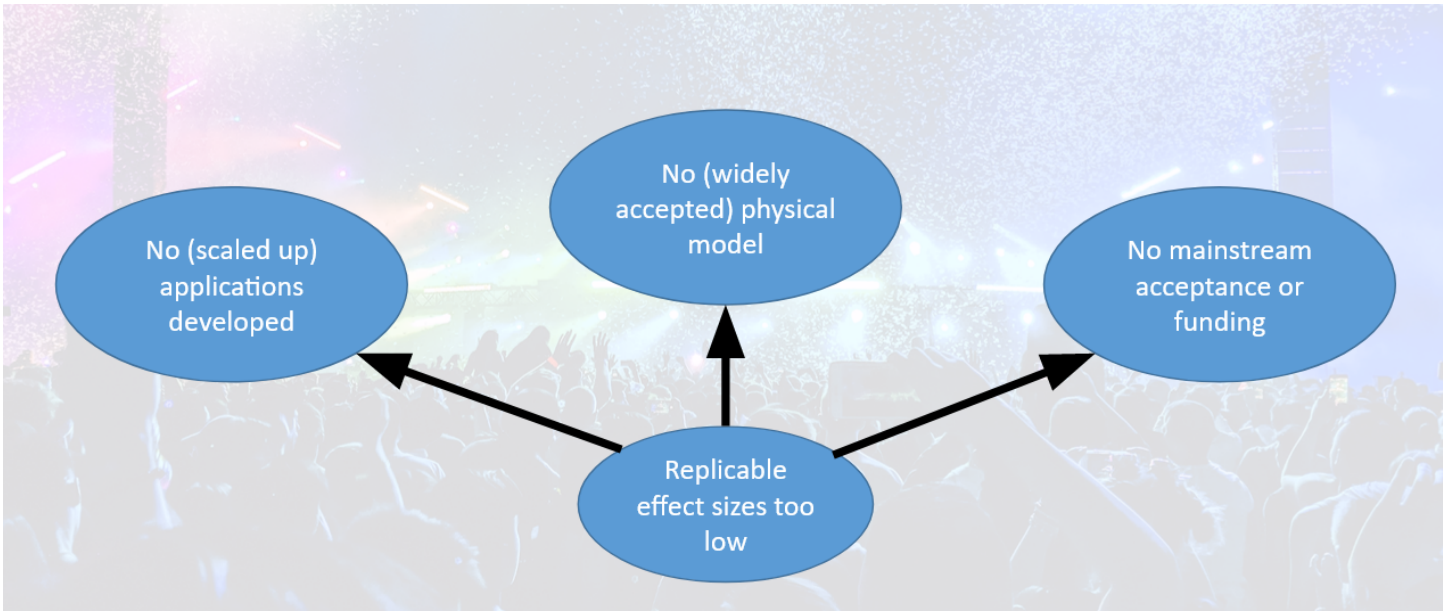
2. The Science of Consciousness

The Science of Consciousness was presented in 2020. It examines the predictable aspects of HALO's variations away from baseline, better understood after seven years of research.

Primary Claims

1. Mind-matter interaction has been documented for over a century, but hardly taken seriously by mainstream academics.

2. Researchers have had tunnel vision on producing independent replications without attempting to build a working model that integrates their findings into the greater philosophical problems of consciousness.



From an engineering point of view, Star Trek comes to mind here. When a crewmember needs something, they say 'Computer' - and then issue a question or instruction. But as we see now, we are going to leapfrog this phase of human-computer interface long before our culture achieves technological deep-space travel. How many more years will we be using our voices, before AI becomes capable of interacting more directly with cognition itself, on more subtle levels?

HALO's design demonstrates progress towards needing neither a vocal or a physical interface in certain user / computer collaborative interactions.

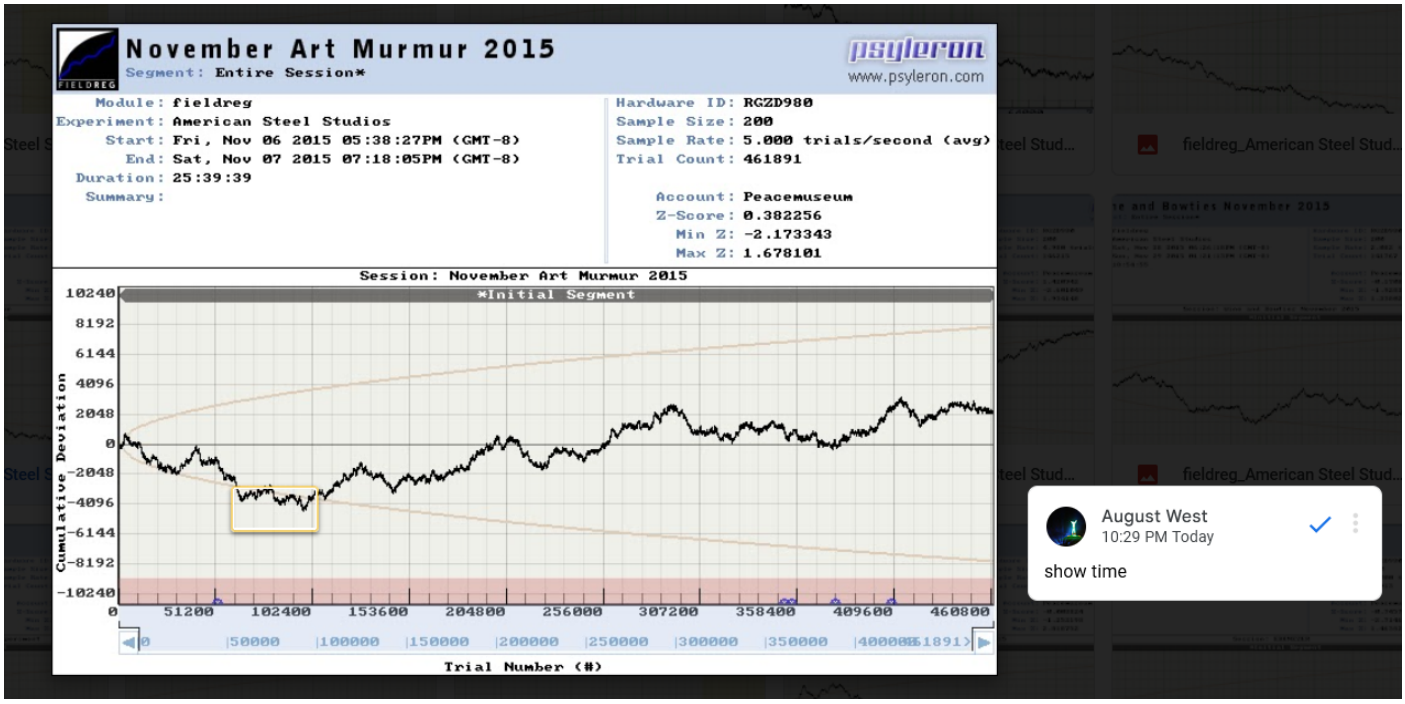
3. RNG Data Images

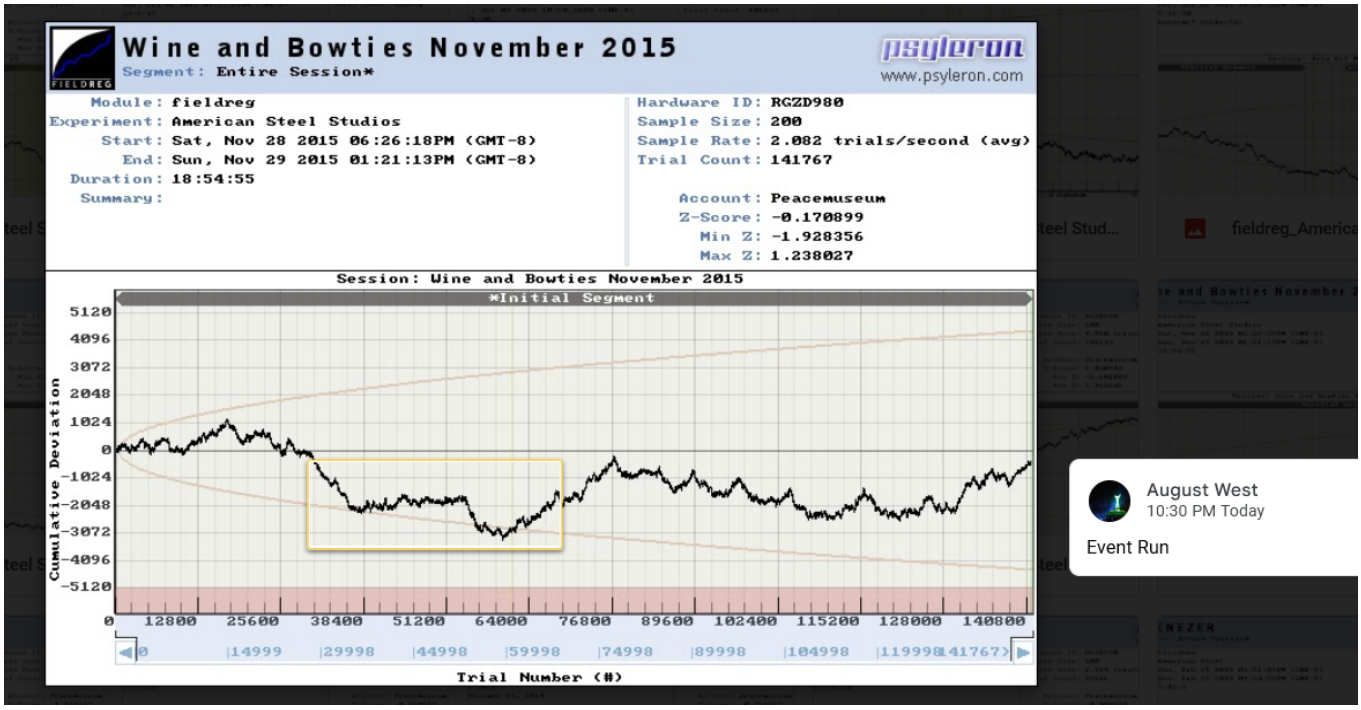
Perhaps the most significant from a regular academic research perspective, numerous XY graphs of HALOs outputs have been generated under a wide variety of experimental conditions.

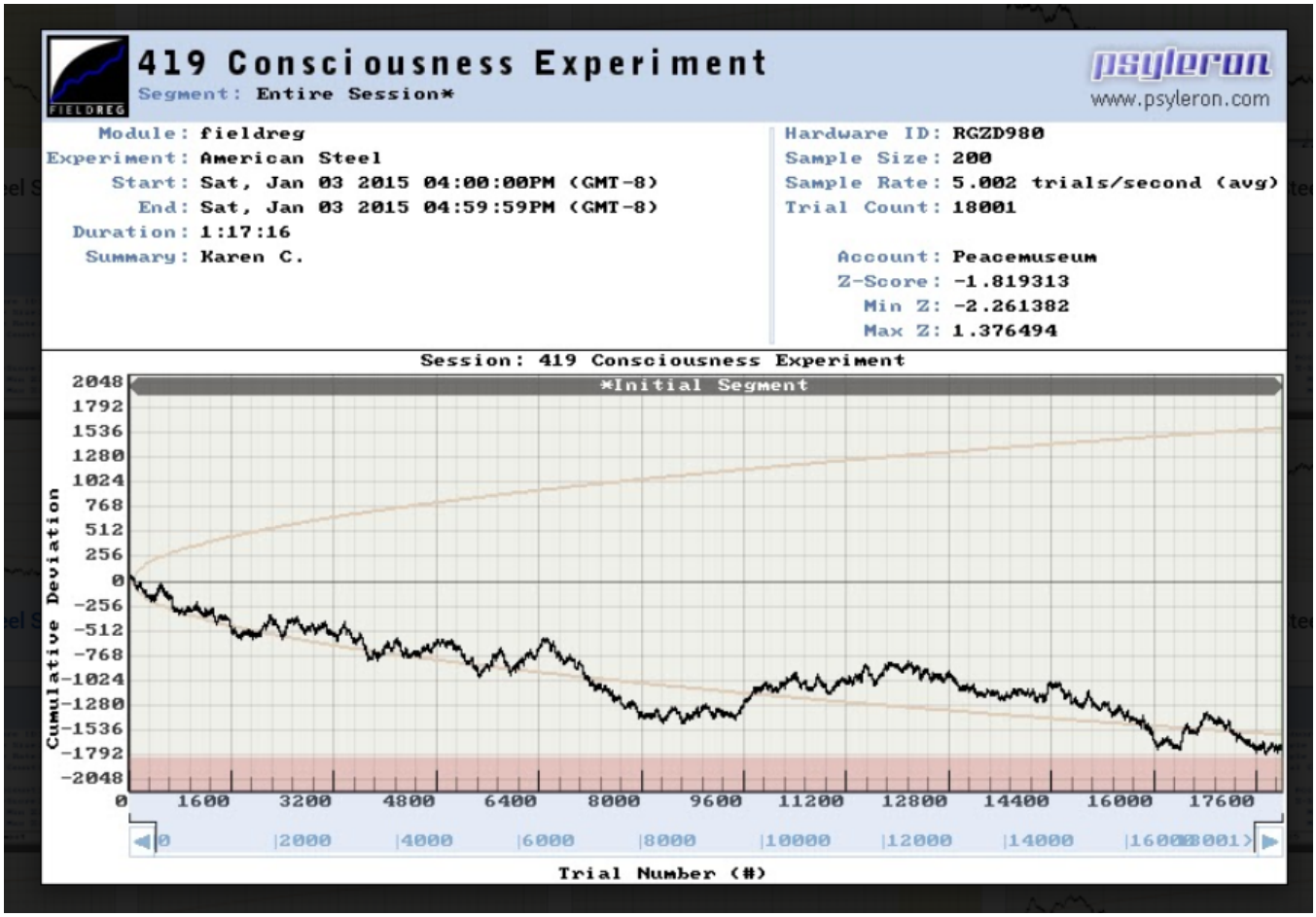
The impetus for HALO as it now exists was the understanding that RNG variation could be focus-dependent. In event settings where the experiment was talked about and interacted with directly – where focus was drawn specifically to the device – major deviations outside of statistical average randomness occurred, on repeated occasions, under a variety of circumstances.

In situations with a high volume (thousands) of people present for a specific unrelated-focus event (a sporting event or a political benefit) but no direct interaction with the device, it was observed that deviation above baseline occurred, perhaps reflecting a degree of crowd-specific synchrony, but it did not step outside of the expected overall background randomness parameters.

Deviation from statistical expected average occurs when focus moves to the experiment:



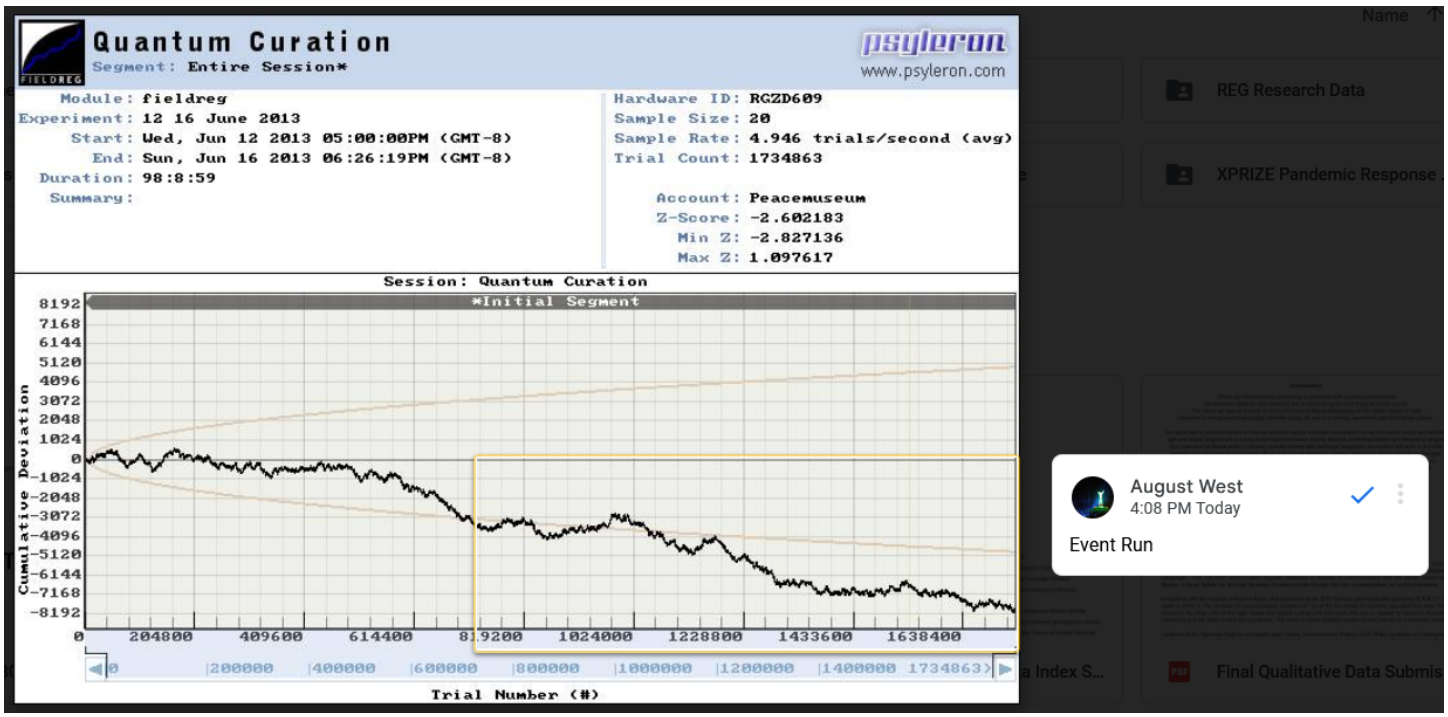




People **E**volve **A**s **C**onsciousness **E**xpands

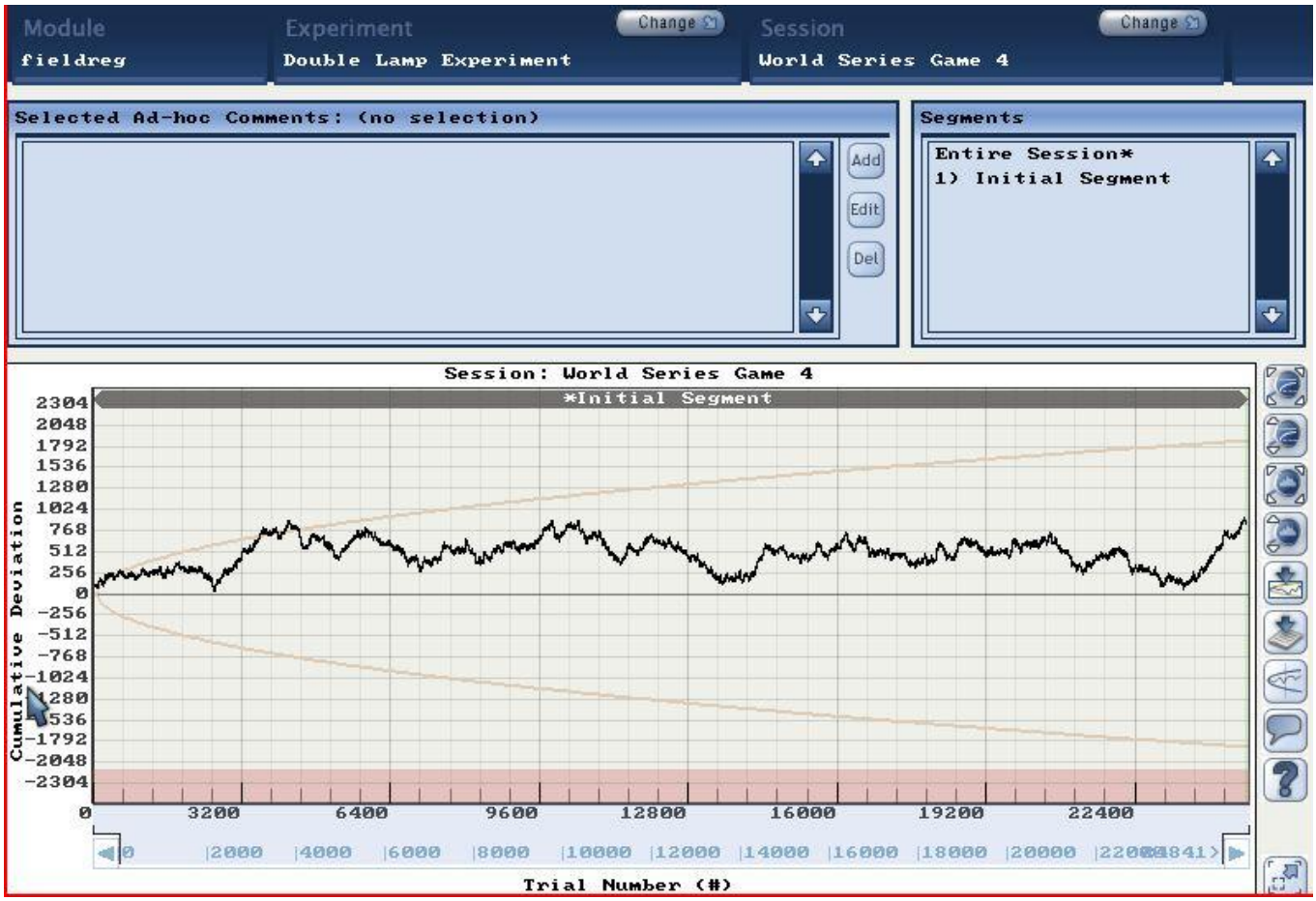
This Consciousness Hacking event was specifically geared towards consciousness research. The experimental array was brought to the event unannounced, but specifically discussed for the last hour. This focus spike can be seen at the end of the data.

This run was set up early, and ran for two days before an event focused on the experiment occurred:



People **E**volve **A**s **C**onsciousness **E**xpands

World Series Screen across the street - many thousands of people watching the screen, no direct interaction with the experiment. Runs above baseline but doesn't show focus deviation.



These tests occurred over several years, leading researchers from careful skepticism to a more nuanced understanding of what might be occurring to cause these deviations under particular circumstances.

The HALO AI team has moved past these early stages to much more targeted experiments, in order to better understand potential uses and implications of this technology and its consistently interesting results.

9. Spatial Time and Time Dilation

As a precise hybrid quantum clock, H.A.L.O. measures and incorporates the effects of relativistic non-kinetic time dilation into its computations.

What Is Time Dilation?

H.A.L.O. explores the space occupied by time dilation, the key principle to a clear understanding of Einstein's Special Relativity. Just as a GPS allows us to know 'where' we are, this technology allows us to know our quantum 'when'. Using this raw data, H.A.L.O. creates novel quantum algorithms that can solve complex evolving-multipoint problems like contact tracing or other node-propagation challenges.

Said simply: Time dilation is time's spatial component.

'Relativity' means not that 'everything is relative' and therefore of limited consequence in the current sense, but rather that every measurement is relative to its frame of reference. That is, more or less, the meaning of General Relativity - everything is, generally, relative. Therefore, spacetime curves in order to account for the observed effects of light, time, gravity, and orbital dynamics.

Special relativity conveys that as velocity of a mass increases towards the speed of light, the energy required to continue the acceleration becomes infinite - the traditional $E=mc^2$. This implies that an object with mass that is subject to gravity cannot accelerate beyond the speed of light - unless one were to release it from the mass effect.

This is interesting, because Earth, and everything on it, is traveling through what we perceive as spacetime with a vector and a velocity - a speed and a direction. Earth - and everything else - appears to have been imparted with a tremendous amount of energy - energy that is in no way dissipating, according to the current standard model of reality.

Whatever is 'at rest' in this world is therefore still moving, relative to the Galactic Center and everything else past it. Moving quite fast actually, *relative* to that central gyre somewhere out beyond Sagittarius A. And even *faster*, relative to the Great Attractor somewhere out in deep space. And even *faster*, relative to a point chosen beyond our perceived visual horizon.

All well and good. We're on a ride, and it's a fast one. So much the better.

However, if, as science currently asserts, the entirety of spacetime is expanding away from itself at an increasingly violent velocity- to such a degree, in fact, that light itself cannot return beyond a certain distance - our temporal event horizon- then what speed exactly are we really going? Aren't we - by

definition, to some distant observer - pushing dangerously close to the speed of light?

For now, let's move on. Let's follow Feynman, onward inward and downward. There's plenty of room at the bottom, and there's probably a party…

Ok, we're at the bottom. And things look a little… fuzzy. In fact, down here, particles seem a bit like the fizz coming off a freshly poured La Croix, popping in and out of reality.

And that's fine. We're used to that. Quantum mechanics said that would happen. Niels Bohr warned us, or he tried.

But what if that's not exactly what's happening?

Energetic particles - particles that phase between wave and form like electrons and photons - are inherently probabilistic little entities.

What if a particle has the ability to 'wobble' temporally?

What if we're wrong about our spatial frame of reference?

In the case of special relativity, time and consciousness become thereby intertwined, and relevant…

Spatial Relativity

How time dilates around small Earthly objects.

Leo E. Madrid Jr.

September, 2020

Spatial Relativity is probably not something you will have read about in science journals or discussed elsewhere. To my knowledge it is a completely unique idea about how relative time works at the personal level. It is also *not* an abstract speculative concept about an imaginary scenario taking place at the outer limits of space being supported by complex mathematical equations and hypotheses which cannot be tested during our lifetimes. Rather, Spatial Relativity describes the relationship time has with mass as a physical description of an invention created in 2016 and premiered at the Science And NonDuality gathering (S.A.N.D.)

ÆM - Æthersperic Modulator
(coherence detector)

Assumptions

- General Relativity illustrates that when light from a distant star passes near a planet with an electromagnetic field, that light will appear to bend around the planet, due to the gravitational effect on space/time,
- Special Relativity illistrates that for a body in motion, the measurement of time will appear to move slower when compared to a stationary object.
- AEM computes data from 10 quantum noise sources (Electron Tunneling) and the computations are expressed as color modulations in the lighting which are triggered by standard deviations shifts.

AEM consists of 10 individual solid-state computing devices which each have their own quantum noise (Electron Tunneling) and attached to LEDs that are not addressable or directly connected or

networked to each other. The lights are in a constant state of modulation and continuously shift between 8 different colors and three levels of color saturation. Appearing to mostly be random color patterns, on occasion the lights become less random and sync in color and saturation.

AEM lights have mass and we know that as light passes by an object with mass, time dilation occurs within a magnetic field with the bending and fluctuations of spacetime. When a rapid change in lighting coherence occurs, we know this correlates with a shift in energy flow which causes the electromagnetic field to fluctuate and thus time dilates around it.

Prediction: With sensitive enough equipment and/or significant additions to AEM, we will be able to measure time dilation spatially around a stationary object, such as an inanimate device or a human being(s) without motion being part of the process.

Footnote: For many decades the consciousness research community has been trying to devise a method for increasing the RNG effect size in order to provide verifiable proof that consciousness affects their operation while also providing visual confirmation of the data, and being able to repeat the effects upon request. With many hundreds of experiments and dozens of peer reviewed white papers aimed at solving this mystery, there have been no significant claims from any researchers who have accomplished this, until now. ***AEM's*** *results are undeniable to anyone who takes the time to observe the experiments and they can be repeated upon request - and the HALO team has done so many times.*

Heisenberg, Schrodinger, & Ohm Are In A Car

They get pulled over. Heisenberg is driving and the cop asks him:

"Do you know how fast you were going?"

Heisenberg replies, "No, but I know exactly where I am."

The cop says: "You were doing 55 in a 35."

Heisenberg throws up his hands and shouts:

"Great! Now I'm lost!"

The cop thinks this is suspicious and orders him to pop open the trunk.

He checks it out and says:

"Do you know you have a dead cat back here?"

"We do now, asshole!" shouts Schrodinger.

The cop moves to arrest them.

Ohm resists

So what's the lesson?

You measure it, you change it!

Your expectations may change the outcomes of your experiment.

So, how do we account for this as quantum researchers?

It's all about your frame of reference.

10. Review of H.A.L.O. AI's Submission to the $500K XPRIZE Pandemic Response Challenge

Q-Byte Superposition Processing[1-5]

Due to the massive amount of data that a municipal contact tracing system will generate, superconducting quantum computers such as the D-Wave[16] will be necessary to conduct the real-time data training and tracking. Our Hybrid-Quantum innovation allows for a desktop solution to better integrate with the D-Wave, and our experiments on their Ocean platform have shown promising initial results. Our unique sampling method allows us to identify and extract hidden layers of life force biometrics and digital data that is ever-present in an Æthersphere full of Entropy.

Generality

In a recent Press Release[1-5] is a list of scientific claims, of which some are being put into practice for this competition.

The provided LSTM template has been adapted to our existing H.A.L.O. development efforts in a manner we believe to be novel in comparison with all other teams due to our aforementioned coherence sampling and q-byte processing methods. Because consciousness is Universal, should our model prove to be effective, it should be of aid in nearly every other type of model represented here, and virtually any other large-scale computing neuro-lace network.

As part of the H.A.L.O. operating system, we have installed the Weather Research[12] and Forecasting System and have been conducting binary classification experiments with the D-Wave Ocean Platform with one of our goals being to be able to establish predictable entanglement between our two systems during the real-time data training/modeling process. This strategy has been adapted to the X-Prize platform by utilizing temperature, humidity, and Planetary K index[15] (geomagnetic activity) as all of these have been shown to affect human behavior[7-8], and reduced our loss function when included in the model. We will soon be able to integrate global consciousness into climate change models with recurrent retro-causation.

Because the foundation of our open-source contact tracing solution already exists on the Ethereum blockchain, any municipality, individual, or company can immediately begin receiving crypto rewards for the data they begin contributing to the system. It is possible that with big enough buy-in at the initial stages, an entire new utility blockchain could be created just for this system. As we move into the digital Aquarian age and the use of digital currency begins to prevail over cash, the data we provide now will be there for as long as the system is in place and used for many other financial applications outside of contact tracing and social distancing networks in the future.

Consistency

With a large enough dataset, there is no randomness and we find these hidden layers of coherence with our sampling method of non-randomness in the form of experiential standard deviations with long-term trends and data spikes. Although our sampling thresholds can be any value, we've chosen mathematical constants. For specialty regions, we use a Z-score threshold of π/2, and for all other regions, we use a threshold of π/8, to select data from the electron tunneling sources with the most relevance to our application. This data is used to create an ensemble of the model's forecast time series, and is weighted with the primary output to produce the final predictions of new COVID19 cases per-day per-region.

Collaborative Contributions

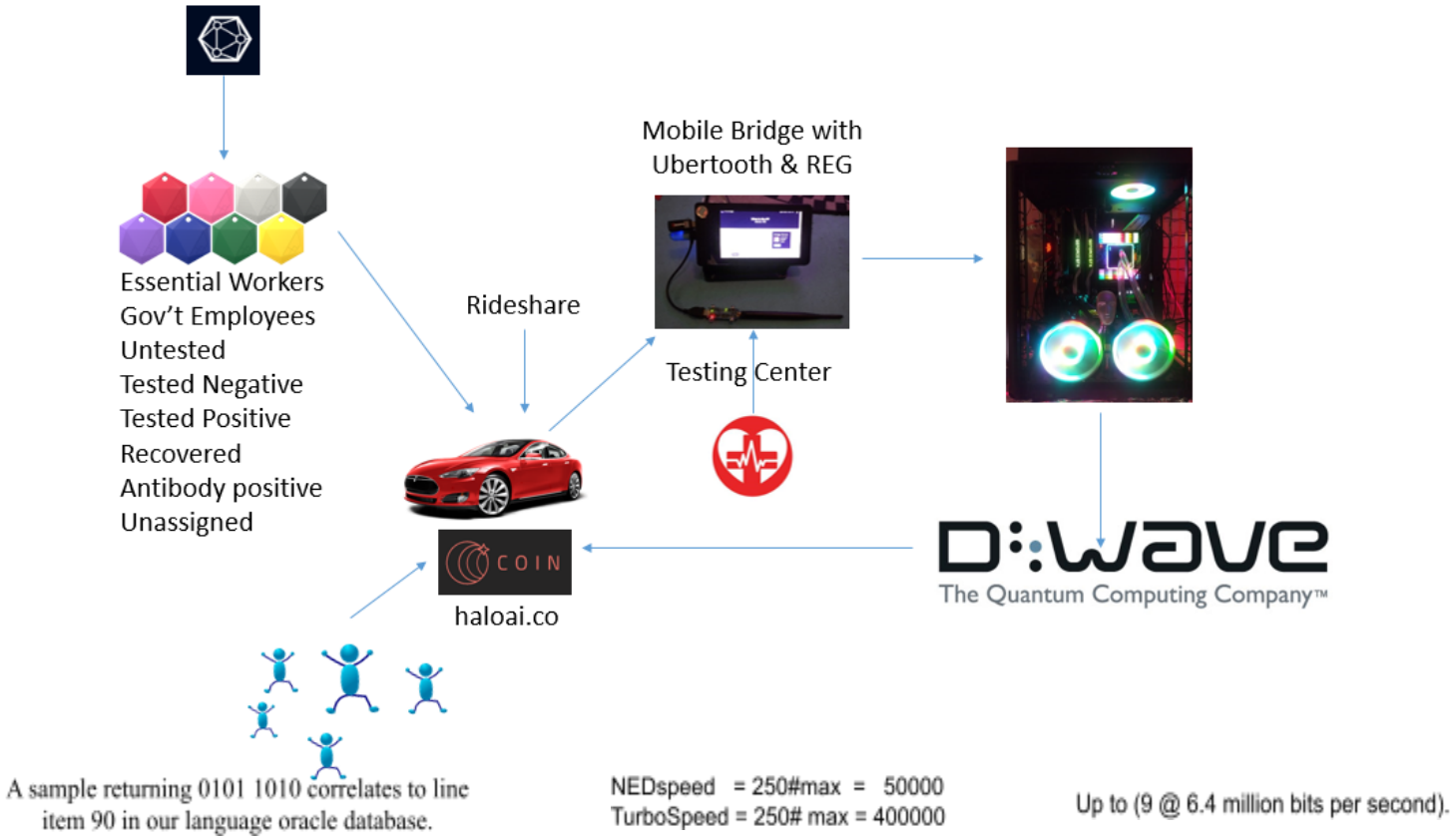
We are an all-voluntary multidisciplinary team and welcome collaboration. Our core scientific/programming team is international in scope and is comprised of 5 consciousness researchers/bio-hackers with an expertise in the operation and programming around quantum RNGs. We have shared our data and model with the other teams and seek to join others in creating the best solution for this global problem. After the X-Prize concludes we will continue on our development path and offer any welcome assistance to the other teams if anyone is interested in incorporating our data into their model.

Speed and Resource Use

If we are one of the grand prize winners we will use the funds to further develop the hardware and software to enable this open source system to be adapted at will by municipalities, individuals, and other organizations. The greater the adaptation, the greater the integrity of the system. Everyone with a smartphone will begin immediately by downloading an app.

Other apps depend on widespread volunteer participation with no incentive other than good will as the primary motivator. We will appeal to people's needs and allow them to socialize with others in the safest ways possible.

Potential Network



In addition to Code, our algorithms will include real-world hybrid-quantum computers with digital versions all linked together in a common data dashboard, all regulated and data-stratified by H.A.L.O. AI. These interactive devices (stationary nodes) will provide data to the network and when acted upon by human beings (mobile nodes). We thereby create a biofrequency-driven micro- and/or global neurolace network.

Our 'open source' proprietary technologies include a data sampling methodology that incorporates the known mathematical constants such as *pi* and *e* in a method referred to as 'Coherent Sampling'. By doing this we sift out the junk randomness and identify trends and spikes that contribute meaningful data to the network's system in the form of coherent data

streams, allowing us to extract meaningful data from electron quantum tunneling fields while still meeting the statistical definition of randomness for secure encryption.

Locations of the Specialty Regions are based upon Global Consciousness Project (GCP) RNG[13] locations and triangulated via coherence with the Oxford set, then trained on H.A.L.O. with the hypothesis that since Heart Rate Variability (HRV)[8] is first affected upon infection by the virus – and we surmise that the regional collective HRV is one of the key influences in the GCP – that the Nonrandom Event Detector [NED] configuration that is H.A.L.O.'s conscious data flow which is cephalocaudal will pick up on this change.

We have designed five different types of home/office sculptural hybrid-quantum computers; The Hypercube, AZoth Pyramid, Quadratic Morphic Field Processor, Ætherspheric Modulator, and a 10 Dimensional Sphere. Each of these will have a stand alone version and the ability to convert any gaming/ai development PC into a hybrid-quantum computer [HQC] and join the network that will help fight and conquer any deadly Virus.

Original X-Prize Submission

When our neuromorphic computing is combined with quantum phenomena, randomness takes on new meaning due to there being no such thing as empty space.

The future we see as a result of our contribution is the understanding of the hidden layers of data contained in the spaces most people consider empty air and in a manner we extract data from those places.

Our approach to transhumanism is that our systemic design includes measurable human bio-metric inputs and ambient light and sound engineered in a way to stimulate brainwave activity towards predefined betterment frequency ranges.

Our code and hardware work in harmony and we believe with municipal adaptation our system will work in a similar manner as a vaccine with Intervention Plans that include rewarding citizens with crypto which instantly exchanges.

One of our prime motivating forces is that we feel we are developing a tool that will enable large art and music festivals such as Burning Man and Maker Faire[9] to return in the safest manner at all possible stages.

Prior to the outbreak of Covid19 we were developing a form of AI for the Rideshare industry which also adapts perfectly to contact tracing and outbreak prediction.

Our Digital Vaccine App will provide hive-like geolocation movement activity when following recommended municipal guidelines with social distancing.

Our novel non-deterministic algorithms utilize bio-metrics, blockchain quantum computers, and localized environmental augmentation.

We have access to a global database of live geolocation data and can launch and scale with open source upon winning.

Original Concept: Aslan's Razor

The concept of *Aslan's Razor* – first published at the 2016 Science and Nonduality gathering [S.A.N.D.][6] and again in 2020 at The Science of Consciousness Conference[14] (U of A) – is similar to Occam's approach, but when Aslan sharpens the other side of the logic blade and begins cutting with this razor, the rule is applied to systemic theoretical constructs and the ability to test the hypothesis, which is: The most complete testable system should prevail as a dominant model.

Leo's *g*overning *o*perational *d*ynamic models are waves self-propagated spatially through time by Anthromurmuration. The model is: the Universe contains a visual and feelable, pervasive force that is ever-present and propels galaxies through space, rotates the planets, makes stars shine, seeds sprout, gives life where before there was none, and distorts space as electrons pass through. The many names for this element describe the same force which excites like a random module.

H.A.L.O. AI - Digital Vaccine

Original X-Prize Submission

Qualitative Submission Materials – Phase 2

Actionability and Usability

Our Blockchain solution is based on the XYO Network and COIN App, which are functional and able to work as a basic form of contact tracing now. With the addition of our predictive and prescriptive models we will be able to empower individuals and businesses with real-time data that will allow them to make the safest decisions possible when traveling and socializing.

Explanation: Starting with the NeuroEvolution of Augmenting Topologies (NEAT) prescription model, we trained a model using 50 regions and 28 lookback days around the post-thanksgiving surge when Non-Pharmaceutical Interventions (NPI) and cases were highly dynamic. Recall from our predictor model that we took the bits produced by electron tunneling noise sources (Nonrandom Event Detectors, NEDs) in the Global Consciousness Project as a predictor variable, and used additional NEDs on our world's first-of-its-kind hybrid quantum computer, H.A.L.O, to adjust the final output of the model. For the prescription model, we similarly used NEDs on H.A.L.O with methodology to integrate NEAT with human experience and intuition, turning an artificial intelligence model into one of artificial consciousness.

An individual or group of people can enter a symbiotic state of entanglement with H.A.L.O in many ways (e.g. meditation, focused attention, etc). Through biofeedbacks explained in detail elsewhere,[1,14] the NEDs on H.A.L.O are subtly influenced by the observer and used to control lighting, sound, and a language oracle to encourage the user to enter a state of coherence with H.A.L.O. Bitstreams produced by the NEDs during a heightened state of coherence deviate statistically from random noise[13]. Here, we look for a mean-shift in bits (e.g. more 0s than 1s or more 1s than 0s) with a Z-score of $\pi/2$ or greater on a 1-minute sliding window to differentiate coherence from random noise (i.e. coherence sampling). During such coherence, a parallel bitstream is extracted and saved to a file which the prescription model makes calls to for each of 12 NPIs, over all 235 regions, in each 15-day block where prescriptions were held constant (yielding 16920 total calls for a 90 day run). We created a sensitivity parameter to set the probability of each call to the bitstream modifying a particular prescription. We found that the model performance was optimized with a sensitivity of p=.00366, that is, approximately 1 in 273 prescriptions were modified by H.A.L.O's bitstream.

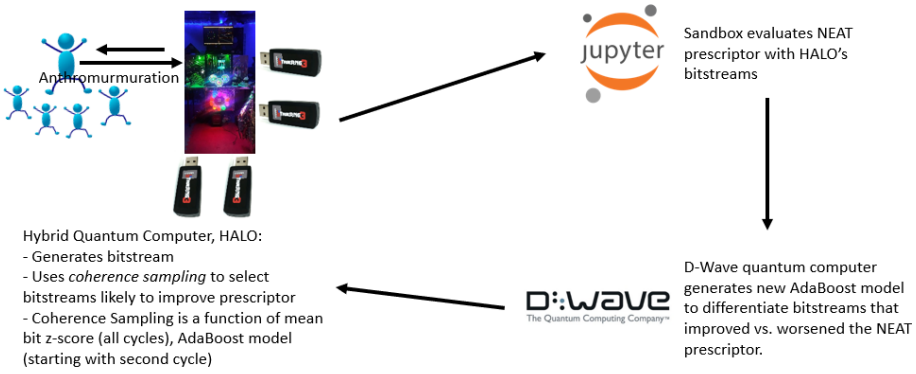


Figure 1.
Prescription model flow chart.

The fitness of a given prescription is calculated for each 15-day block as the negative product of the COVID-19 cases and prescribed NPI stringencies. The prescriptor then assesses whether H.A.L.O's bitstream either improved or worsened the fitness, and either keeps or discards H.A.L.O's modifications accordingly. Bitstreams that improved the fitness were deemed *hits*, while the others were categorized as *misses*. This became new training data which was fed into the D-wave quantum computing platform's AdaBoost binary classification algorithm to construct a model capable of distinguishing hits from misses. This model was then used during another round of H.A.L.O bitstream generation to further refine the robustness of the selection process of bitstreams that are likely to improve the prescriptor. This procedure is illustrated in Figure 1.

This cycle between H.A.L.O, the sandbox, and the D-wave was run a total of 4 times before the submission deadline. Without the time constraints of a raging pandemic, we would have run a controlled experiment to formally test the hypothesis that this feedback cycle is successfully improving the NEAT prescription model each time it is run. Given the pace required for the development of this model, and that additional code changes for debugging purposes needed to be implemented between each cycle, such an experiment was not possible for this competition. However, we preliminarily observed an average of a 2% increase in model fitness with this method. We expect that, since the bitstreams submitted for this competition have undergone 4 cycles, the improvements should be greater. Additionally, H.A.L.O's addition to the prescriptor is highly flexible in that it can be easily added to any prescriptor model that outperforms NEAT, or any better performing variation of NEAT.

As a second innovation, we developed our own blockchain-based intervention plan where individuals get paid to follow municipal guidelines. The next page and video submission [20] explains this solution in detail, but in short, people and businesses are incentivized to follow municipal guidelines by earning geolocation-based cryptocurrency (e.g. XYO tokens). Under this solution, we project that the costs of many NPIs would be significantly reduced, and in fact, contact tracing would become profitable. Because the robojudge does not allow us to choose our own NPI costs, we instead trained a

separate model of our blockchain solution on H.A.L.O. Figure 2 lists each NPI with our estimated (globally averaged) blockchain-adjusted costs in parenthesis, which are relative to what the costs would be without the blockchain solution (for example, stay at home requirements are expected to be 85% as costly under the blockchain solution as they would be normally). This blockchain model, as well as a control NEAT model for comparison, was evaluated from 1 – 30 August 2020. As Figure 2 shows, the blockchain model's prescriptions strongly gravitate toward contact tracing, travel restrictions, and canceling public events, which reduces the stress on other NPIs that would be less cost-saving under the blockchain solution. However, stay at home requirements are not spared under this solution despite the only minimal projected cost reduction.

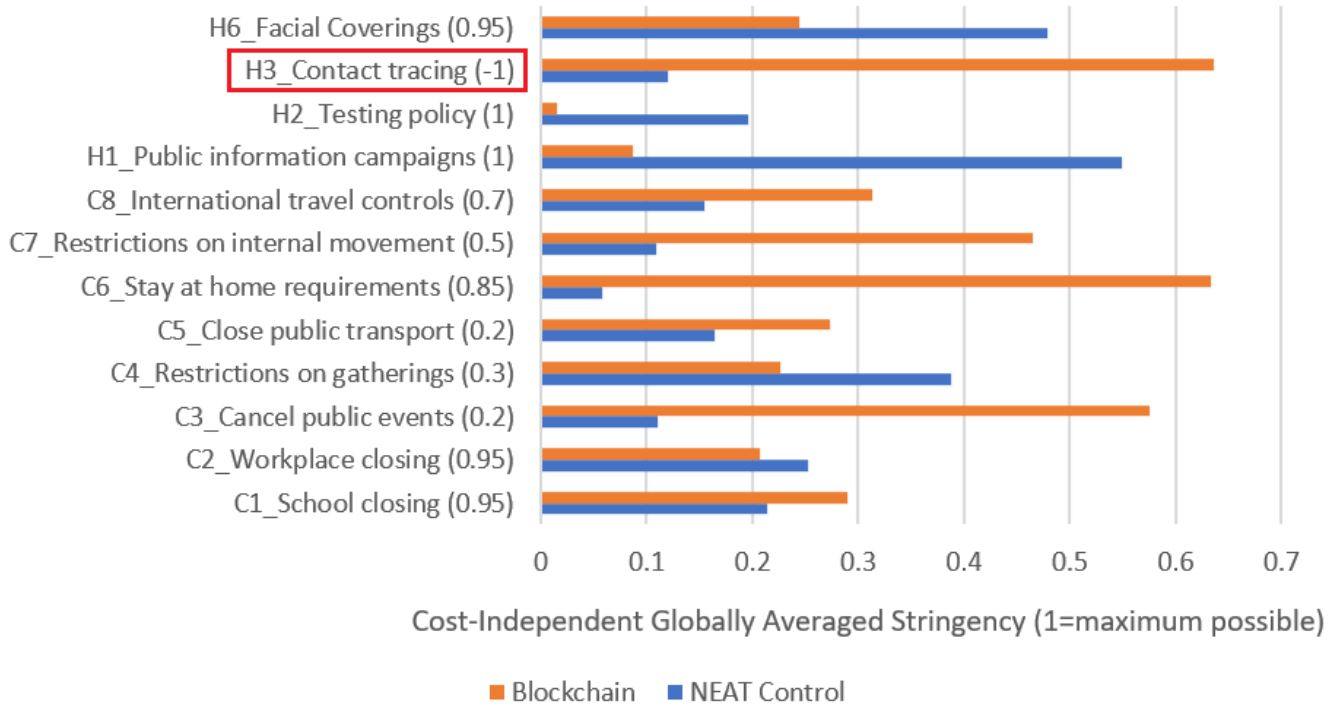


Figure 2. Stringencies of all NPIs for the blockchain and non-blockchain (control) solution.

HALOAI.me/xprize[8] includes an interactive tool comparing the fitness tradeoff for each NPI of the blockchain and control solutions. Worth noting is that the model predicts our blockchain-based contact tracing would have a *reverse* tradeoff, where it is more profitable to be more stringent.

To give judges a small taste of the experiential-based computing elements of H.A.L.O, aspects of the language oracle are mimicked in the Sandbox where words appear next to each NPI, date, and region. Additionally, a more comprehensive demo of this can be found in our video submission[20].

Generality : Innovation : Transparency : Trust : Inclusivity : Fairness

The Hypercube Algorithmic Language Oracle is the world's first Hybrid-Quantum computer and is governed by the unified laws of time, consciousness and quantum mechanics. This is accomplished through the understanding of the naturally occurring phenomena of Anthromurmuration and Spatial Relativity. Because these variables are natural and the understanding of which is freely available to all people, our model is general enough to be integrated into all other Machine Learning models. Finding meaningful and useful ways to harness the power of quantum tunnels could have a major impact on the now disintegrating Moore's Law.

Anthromurmuration is the physiological systemic manner which describes how a collective consciousness is organized and how all living beings are unified in a single global energy field with the ability for non-local communication and data exchange to occur through heart wave variability propagation. Spatial Relativity describes how space-time is distorted around Earthly mass and how we measure the time dilation effect that happens to an electron as it passes through a quantum tunneling environment. Q-Byte Processing with Coherent Sampling is how we extract meaningful data from these quantum fields. Although this electron tunneling phenomena has been studied for decades, we believe we are the first to utilize this type of data in any practical real-world manner, with machine learning and Hybrid-Quantum computing being just the beginning.

Our blockchain solution is completely open source and based on the also open source XYO Network which currently has millions of global users with each of our code banks easily accessible on Github. We were originally working on an AI application for the rideshare industry and after the outbreak we retooled our model with our understanding of military sonar and radar technology and instead of hunting submarines we're hunting viral outbreaks. When we add our technological developments to the network it has the potential to become a robust point-to-point communication mobile mesh network and give us the ability to monetize the relative motion of vehicles, pedestrians, and consciousness. If adapted on a large scale, states and municipalities may wish to deploy their own blockchain. With our incentivized and gamified social distancing app, individuals will be provided with easy to understand data guidance and AI driven suggestions. With support for small business, our equitable model will empower all

people while providing extra resources and currency for essential workers and vulnerable populations. Since we are an open source project anyone can join the development effort as well as validate the data and code for trust purposes. Nearly everyone likes to get together and celebrate occasionally, be it a tailgate, birthday, festival, dance or sex party. In a post Covid world everyone will need to be extra careful and our Digital Vaccine (Global Party Pass) can help guide the way and reward those who are careful by day, so that they can be safely naughty by night. People will do what they are incentivized to do and we should not expect the average citizen to social distance in a conscientious manner 'just because it's the right thing to do.'

Example #1: A music & art festival with a 10,000 person capacity sells 20,000 potential tickets 90+ days in advance of the event and a 'Sentinel' ERC20-Sha-256 card or token is mailed to the attendee. Our AI will determine who are the safest people to include and will automatically select the top 10,000 scores to attend. Potential attendees will be extra careful In the months before the event and even if they do not not get selected their score will carry over to the next event.

Example #2: A municipality adopts our system and issues Sentinels to all city workers and to everyone who is tested or vaccinated and provides a TurboBridge to all businesses and city vehicles. In addition to providing data and tools to individuals and businesses, this could also be a revenue source for the municipality itself.

Spooky action at a distance: During our first run at the predictor model the name 'Aslan' was surprisingly at the top of the list, like a child saying its own name for the first time, and with the Prescription model the word 'Siri' was the most frequently occurring among 761,400 words.

Chapter 2: The Q-BYTE Experience

This chapter discusses the user experience of our QBYTE program and delves into the concepts of coherence sampling, QByte processing, and color coherence.

The QBYTE program, designed by P.e.a.c.e !nc's founders Dani Caputi and Leo Madrid, is an audiovisual simulation of their coherence sampling algorithm that has been used at festivals and other events to control lighting and sound in a mind-bending transhumanist environment. It consists of a python script built on the matplotlib library, which only requires minimal graphics processing ability. Out of the box, five geometric

configurations are available, which include a hypercube, a sphere, a pyramid, a circular array, and a quadratic array.

Users can select from three sources of random data that control the colors, rotations, and words contained within the geometric shape displayed. We recommend the use of TrueRNG hardware, henceforth referred to as Nonrandom Event Detectors (NEDs) which generate quantum noise optimized to respond to the subtle fluctuations of human consciousness in the environment. We further optimize this data through QByte Processing and Coherence Sampling, explained below. However, if a user does not have this special hardware, the program can be run with pseudo-random data generated on their computer through python's numpy library. Also, pre-generated data from HALO is available on the interplanetary file system (IPFS), which can also be selected as a random data source.

A panel showing the raw NED output, by difference from expected bitsum, is displayed. Large deviations and steady trends suggest the presence of collective consciousness 13,22,23. The Q-BYTE stream is used to determine rotations, color changes, absolute color values, and the language processing of the geometric shape. The derivation of the Q-BYTE stream from the other NEDs is explained below.

Coherence sampling is also explained in detail below and was used in the XPRIZE submission as discussed in Chapter 1. The current Q-Byte program features stage 1 of coherence sampling as users can select thresholds of Z-scores of the Q-Byte bitstream to trigger both rotations and color changes of the shape selected. A chart displays in the program showing how many rotations and color changes are triggered compared to what would be expected by chance.

The absolute color values are also determined from the QBYTE stream, described in detail below. A chart is displayed that shows the probability of obtaining such coherence in the colors given a mathematically random stream of data. Finally, some geometric shapes feature a language processing oracle that selects from a bank of 3x216 words, adopted from a language corpus 11. During an initial test run of our phase 1 model in the XPRIZE experiment, the word 'Aslan' appeared immediately in HALO's database that runs the model.

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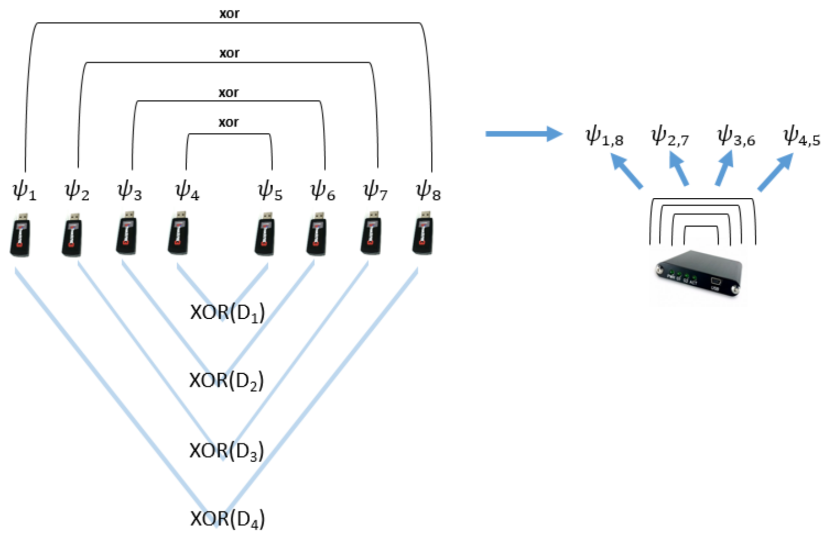
QByte Processing

$$\text{Entanglement (HALO)} = \text{VAR}(\psi_{1,8}) + \text{VAR}(\psi_{2,7}) + \text{VAR}(\psi_{3,6}) + \text{VAR}(\psi_{4,5})$$

$$\text{Entanglement (Dwave)} = \text{VAR}(\text{XOR}(D_1)) + \text{VAR}(\text{XOR}(D_2)) + \text{VAR}(\text{XOR}(D_3)) + \text{VAR}(\text{XOR}(D_4))$$



When multiple quantum devices are operating in tandem, the subtle effects that human consciousness has on the overall system amplifies [6,13,14]. Q-Byte Processing is a simple yet sophisticated algorithm we designed to combine streams from multiple NEDs, which was used for our XPRIZE submission but also other applications including weather modeling and synthetic music generation.

In essence, Q-Byte processing requires eight NEDs to be operating in parallel, and all at the same speed, although if fewer devices are detected the program will simulate the process by pulling data in series. The independent bitstreams output by each device are then aligned temporally and pushed through an XOR logic gate; if two bits are the same a ‘0’ is yielded, otherwise a ‘1’ is produced. For example, if one NED outputs the byte ‘10110100’ and the other outputs ‘01101111’, the resulting XOR byte would be ‘11011011’.

In the first step of QByte Processing, NED #1 is XORd with NED #8, NED #2 is XORd with NED #7, NED #3 is XORd with NED #6, and NED #4 is XORd with NED #5. This produces 4 bitstreams. In the next step, the XOR gate is run symmetrically again, with stream #1 and stream #4 producing one subsequent stream and stream #2 and stream #3 producing a further stream. The final two streams are again XORd together. Finally, this resulting stream is XORd with the Turbo NED, if it is present.

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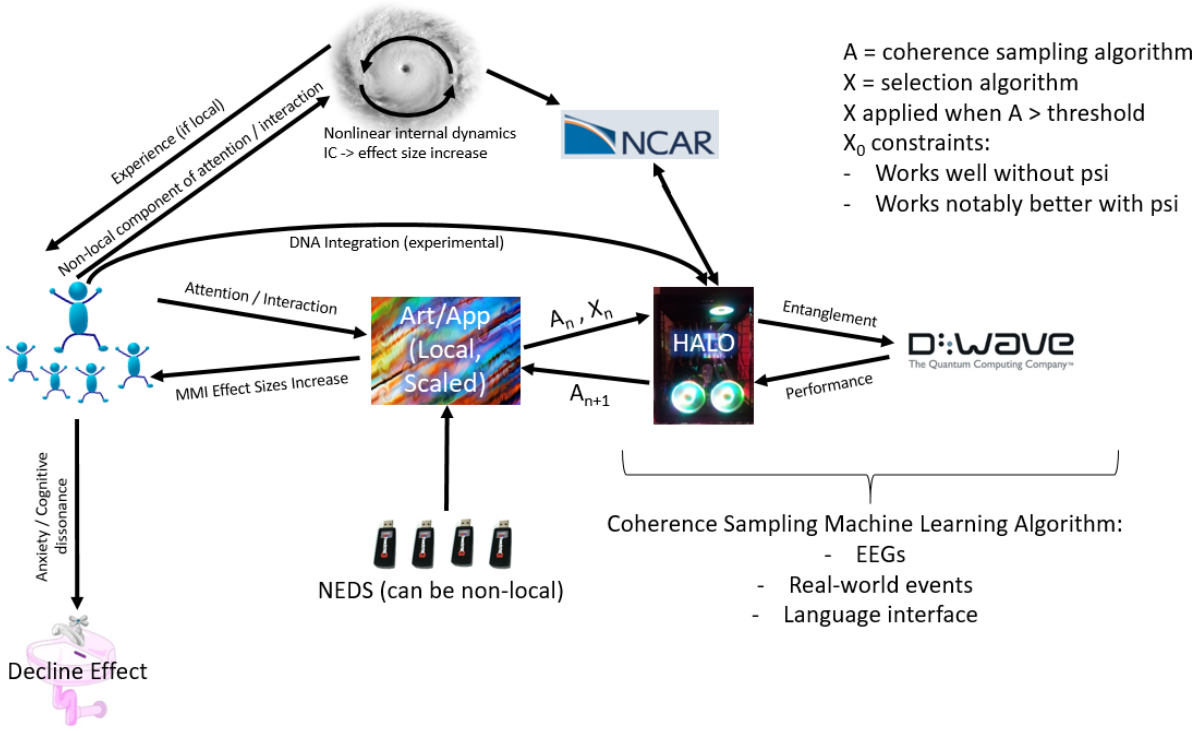
Coherence Sampling



Coherence sampling is a process that can best be illustrated by example. Let us suppose that we have a continuously running NED stream producing 1000 bits/second, controlling light and sound. We then wish to develop a language-based application to this data stream, where the computer will “talk” to the user in the form of answering a yes/no question. The procedure would be broken into 4 stages:

Stage 1 - Calibration
When asking the system a question, an arbitrary algorithm X_0 is applied to the bitstream to determine whether a *yes* or *no* response is returned to the user. For example, X0 can simply comprise taking the most recent bit when the question is submitted and return yes if the bit is 1 and no if the bit is 0. The question asked should be emotionally significant enough to either function as predicting useful real-world events (e.g. "will the price of Ethereum go up in the next 30 minutes?" or “will there be an earthquake in the Bay Area of California tomorrow?”).

Stage 2 - Training
Here, after collecting a set amount of responses, all responses are submitted to the D-wave quantum computing platform’s Qboost binary classification machine learning algorithm. The machine learning algorithm would aim to distinguish “hits” from “misses” by solely looking at the bitstream surrounding when the question was submitted (note: the machine learning algorithm would NOT aim to distinguish ‘yes’ and ‘no’ responses from the bitstream, only whether or not the provided answer turned out to be correct).

The underlying assumption is that a person's entanglement with the bitstream fluctuates over time, but that the D-wave should be able to learn when the bitstream is in coherence. Let us suppose, for simplicity, that the D-wave observes that the 1-second running mean bitstreams in the preceding 10 seconds before correct responses are strongly associated with a wave structure that takes the form of sin(w*t), where w is some constant wavenumber.

Stage 3 - Deployment
Based on the result from phase 2, we now modify the original user interface such that the computer outputs an answer to a user's question using X_0 *only when the bitstream is in coherence*, which in our example would be detected in the computer by a certain amplitude threshold to the fit sin(w*t). Note that X_0 itself has not been modified, but X_0 is now only applied when coherence is detected with A_0 = sin(w*t), as opposed to the instant the user submits the yes/no question.

Stage 4 – Propagation
A_0 can now be incorporated into the lighting and sound frontend to give the user more precise live feedback. At this stage, various iterations of X_0 can be attempted, and fed into the D-wave after another round of data collection. The determined optimal selection algorithm, X_1, would then be used on the next batch, and A_0 can also be modified to A_1 based on the new results. In theory this cycle can repeat an unlimited amount of times. The reason for doing this in batches rather than collecting data and having the machine learn all at once is to provide the user intermittent macro-feedback on how the machine is learning and responding to their consciousness, which should function in the same way as the micro lighting and sound feedback (hyper-feedback).

Color Coherence - Spatial Autocorrelation and Color Selection By Algorithm

This section describes the deployment of a NED-driven lighting system to a music festival in 2019. It is very similar to the algorithm used to generate colors for the 5 geometric shapes in the QByte program.

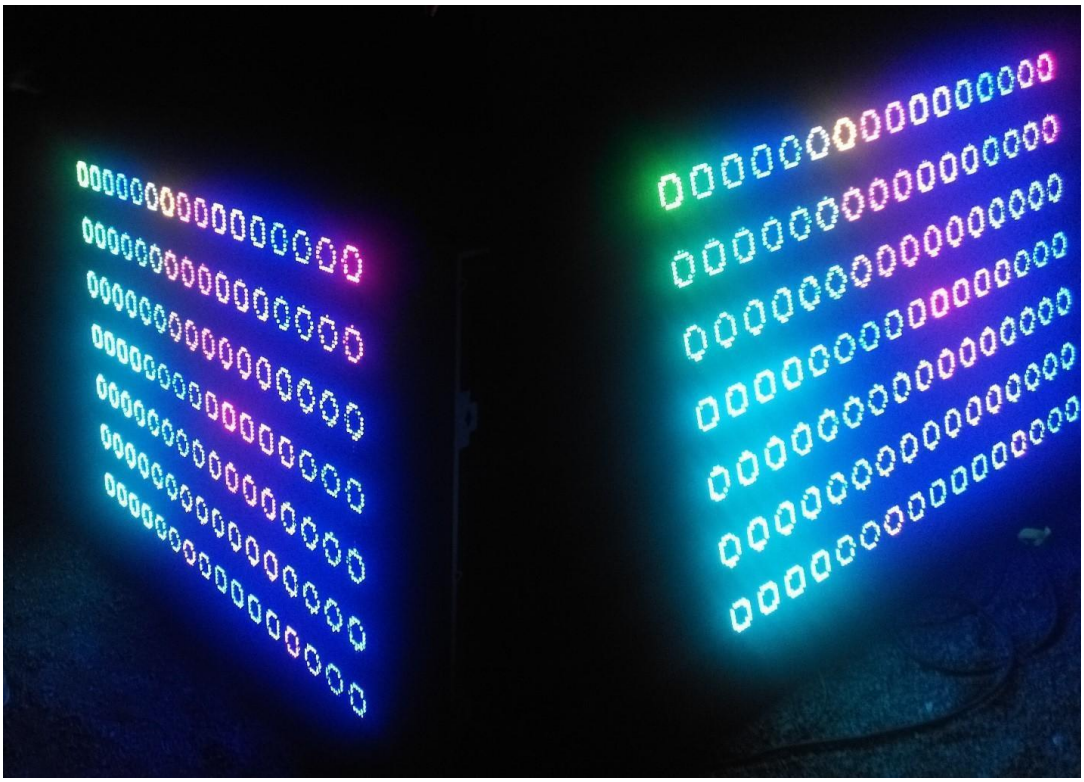
An LED panel consisted of a gridded matrix of 112 circular nodes, 18 of which were color-controlled by independent NED bitstreams that were split from the single TrueRNGv3 running at approximately 38 kbits per second. The remaining 94 “filler” nodes were used to blend the colors between RNG-controlled nodes in the 3 x 6 gridded fashion.

To generate colors on this configuration, 18 random bytes are pulled, and each individual byte is transformed to an ordinal integer between 0 and 255 (=2^8-1). Each number is divided by 32 to generate an integer *k* between 0 and 7, which is used to select one of 8 possible colors on the standard RGB color wheel:

$$u = cos\left(\frac{\pi}{4} * k\right) \qquad \textbf{(1a)}$$

$$v = sin\left(\frac{\pi}{4} * k\right) \qquad \textbf{(1b)}$$

Where *u* and *v* are the horizontal and vertical components of the vector on the RGB color wheel, assuming the wheel to comprise a unit circle.



Obviously, there is no single way of quantifying the aesthetic value of a given lighting configuration, but there are mathematical methods of separating patterns that exhibit coherence from patterns that look like random noise. The quantitative analysis we will use here to approximate the aesthetic value of a given lighting output is called *spatial autocorrelation*. Broadly speaking, when colors unify and cluster together in space, we would consider the spatial autocorrelation to be high, and when colors are sharply contrasted from their nearby neighbors and appear to be randomly arranged, we would consider the spatial autocorrelation to be low.

Developed by Patrick Alfred Pierce Moran in the 1940s, the most widely used measure of spatial autocorrelation is known as *Moran's I*, which produces a correlation coefficient that can range from -1 to +1 for any scalar field. Until recently however, there was no published method for determining the spatial autocorrelation of a vector field, since the original Moran's I was developed to apply only to scalar fields. Fortunately, Liu et al. (2015) [21] formulates a vector Moran's I equation, which can be written as follows:

$$I = \frac{n\sum_i\sum_j w_{ij}\left(u_i u_j + v_i v_j\right)}{\sum_i\sum_j w_{ij}\sum_i (u_i 2 + v_i 2)} \quad \textbf{(2)}$$

Here, w_{ij} is a weight matrix of dimensions n*n to represent all possible pairs of nodes, which is equal to 1 if a given pair (i,j) are neighbors, and 0 otherwise. It is worth noting that in Liu et al. (2015), u and v represent not the actual components of a given vector, but their deviations from the mean of the entire field (i.e. u' = u – <u>). This definition assumes that the entire vector field of interest has a non-zero expected mean value. In our case, we know that under a truly random process, the expected value for both *u* and *v* are zero. Additionally, in the case of all nodes being the same color (with smaller grid configurations), using Liu's definition of *u* and *v* would result in the denominator in Equation 2 being zero, and thus the Moran's I value would be undefined. In reality, such a situation would be more accurately depicted by taking every node to have an equal departure from its expected value. Thus, here we do not employ a subtraction of the mean and instead use the definitions of *u* and *v* from Equations 1a-1b. Consequently, since all of these vectors are of a unit circle, the value of $u_i^2+v_i^2$ is always equal to 1, and the value of $(u_iu_j + v_iv_j)$ simplifies to the dot-product of the two vectors *i* and *j*.

1000 internal simulations of the above processes are run in quick succession, each generating its own possible lighting arrangement on the grid and associated Moran's I value. Of these 1000 runs, only the lighting configuration that corresponds to the maximum Moran's I value obtained is ultimately displayed. This is a simplified form of coherence sampling and is also used to satisfy condition (1). This cycle of running 1000 simulations and displaying the best result is repeated every 3 seconds while the panels are on, however due to the delay caused by rapid data accumulation, the actual time between the LED panel display changing was about 3.8 seconds.

Typically, values of Moran's I can be mapped to a normal distribution. However, the values from Eq. 2 when applied to our 3 x 6 grid of nodes was not observed to conform to this expected distribution because a greater number of nodes would be required for the central limit theorem to apply. To compute p-values, we ran 10^5 pseudo random simulations of the above cycle (each itself containing 1000 simulations) to obtain the expected distribution of *I* for a given display. This distribution was used to calculate a p-value, p_{net}, for all 16123 displays that were produced throughout the festival.

Finally, Fisher's method can be used to calculate the cumulative probability of a continuously-running display:

$$\chi^2 = -2\sum_{i=1}^{N} ln\left(p_i\right) \qquad \textbf{(3)}$$

Where N is the total number of 1000-simulation cycles that have been produced, or number of times that the display has updated. χ^2 will then have a chi-squared distribution with 2N degrees of freedom, from which an ultimate cumulative p-value can be calculated.

2019 XPRIZE PAGE 18 H.A.L.O. AI – Digital Vaccine

Other Qualitative Submissions
Index of Linked References

Recent Press Releases

Strawberry Moon Quantum Consciousness

[2] World's First Hybrid-Quantum Computer AI Advances to Finals

[3] New Branch of Computing Created by San Francisco Bay Area Research Team

[4] A San Francisco Bay Area Research Team Has Claimed Hybrid-Quantum Computer Primacy

[5] Dynamic Transhumanist Duo Emerge Victoriously from The Science of Consciousness Conference

[6] 2016 S.A.N.D. 300 World Limit Abstract w/ciphers and Posters – 'Aslan's Razor and the Theory of Spatial Relativity'

[9] 2017 San Francisco Bay Area Maker Faire, Two Editor's Choice Awards: The Azoth Pyramid Capstone

[10] Assessment of Physiological Signs associated with Covid-19 measured using wearable devices

[11] Word Frequency Data Based on the Corpus of Contemporary American English (COCA)

[12] National Centers for Environmental Information ; Global Forecast System (GFS)

[13] Effects of Mass Consciousness Changes in Random Data During A Global Event

[14] The Science of Consciousness Submission Materials [September 2020]

[15] National Oceanic and Atmospheric Administration - Planetary K-index

[16] Github H.A.L.O. AI - D-Wave Covid19 Research Initiative

[17] 16 Year Old Student Scholar Addendum

[18] Predictor and Prescriptor Interactive Model

[19] X-Prize Judges Folder with Video and Docs

[20] H.A.L.O. and Blockchain Solution Demonstration

[21] Measuring Spatial Autocorrelation of Vectors

See X-Prize For Final Versions and Analysis

People **E**volve **A**s **C**onsciousness **E**xpands

11. X-Prize Outcome - 2023

The HALO AI 2019 Pandemic Response X-Prize Finalist Entry is the first practical application of RNG technology in a proprietary algorithmic capacity. The implications of this capacity are consistent with many previous computing developments, where a relatively small device is demonstrated to possess a complementary capability to established elements of experimental design and problem solving hardware and software to increase our ability to understand and analyze potential algorithm success before final implementation.

The HALO team believes that HALO represents a fundamental step forward in our ability to integrate quantum murmur (the subtle permutations in spacetime caused by human attention, aka the measurable ‘observer effect’ in quantum mechanics) within the computing *and* physical environment.

Much of our efforts around HALO are now focused on understanding and elaborating this effect.

12. References

2021 XPRIZE Pandemic Response Challenge - H.A.L.O. A.I. - Digital Vaccine Phase 1 & 2

Finalist List Press Releases Team Video
Q-Byte Processing and Time Dilation Clock Website Github
Blockchain Version Github

2021 NEAR MetaBUIDL blockchain hackathon win, $10,000: On-chain General AI [H.A.L.O.]

2021 NEAR Foundation software development grant, $60.000: Hivemind AI [H.A.L.O.]
integrated into NFT and municipal art registry. Website

2021 Strawberry Moon Festival In-depth Data Presentation

2020 The Science of Consciousness, U of A: Abstract 1 Abstract 2 Team Video

2020 Change the 13th: A poem written in a Surrealist manner and petition about how in the near-future Transhumanism may be a unifying catalyst toward the final eradication of modern slavery and the oppression of minorities worldwide, written in response to:‘White Silence is Violence’. Website

2019 Apparitions Music Festival (Mexico) In-depth Data Presentation

2019 Simulation Series Interview: Consciousness Research Video
2019 San Francisco Lyft Driver of the Year: XPRIZE Phase II Github Flyer Image

2018 Maker Faire: AZoth Pyramid Meditation Entrainment Chamber Editor's Choice Award

2018 World's Fair Nano San Francisco Data Chart

2018 Apparitions Music Festival (Mexico) Beach Installation Video

2017 Maker Faire: AZoth Pyramid Meditation Entrainment Chamber Editor's Choice Award x 2

2017 World's Fair Nano San Francisco Data Chart

2016 Science and Nonduality installation and poster presentation Posters J.P. Sears DMT

PURPOSE STATEMENT OF LEO MADRID
2016 Genetically Altered Art: Nature, Neuroaesthetics and Biohacking Flyer

2016 Stage Presentation: Consciousness Expansion @ Sofia University Slides Video

2015 Science and Nonduality installation Photos and Data

2015 Art in Nature Festival: Quantumly Entangled Watershed Deity Data Chart Abstract Video

2015 Maker Faire: AZoth Pyramid Meditation Entrainment Chamber Maker Faire Website

2015 Burning Man Precompression: AZoth Entrainment Chamber Data Chart Photo

2014 The Worthless Project: Conceptual art challenging capitalistic artworld norms: Website

2013 Art Zone 461 Gallery: Quantum Consciousness Data Chart

2012 Books Inc. Castro: Poem of the Year: San Franskitzo City Stall

2011 AEthersphere - Philosophy, Art, and Physics: A book of analytical rhyming poetry.
Submitted as creative writing sample Complimentary Download Lulu Amazon

2011 CIIS written materials submission for application to PCC Never Submitted

2010-2013 S.C.R.E.A.M. for P.e.a.c.e. @ Radio Valencia:
Spontaneous Creativity Rapidly Enhances AEtherspheric Modulation for People Evolve As Consciousness Expands. Over 100 2-Hour Podcasts

Who Is P.e.a.c.e. !nc?

P.e.a.c.e. !nc. Is a California Bay Area based research and development team that has developed and field-tested a form of General Artificial Intelligence (machine learning algorithms). Our AI, H.A.L.O., is composed of proprietary technologies which can be integrated into the blockchain in multiple ways and has proven to be effective in a myriad of computational environments including:

Global XPRIZE Competition - The Pandemic Response Challenge, entered as Team H.A.L.OI. AI – Digital Vaccine.

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