QUANTUM PSYCHOTHOTONIX
A PRIMER

Dr. Richard Conner & Marcus Rodriguez

PREFACE

Quantum psychothotonix (*patent pending*) integrates key principles from the fields of mathematics, quantum computing, psychology, and photonics. As used herein, quantum computing refers to processes for information manipulation using principles and hardware inspired from quantum physics. Psychology may be the scientific study of the human mind and behavioral interactions. Photonics is the physical science of light generation, detection, and manipulation through emission, transmission, modulation, signal processing, switching, amplification, and sensing. A quantum computer is a physical system for the harnessing of quantum effects to perform computation. In contrast to conventional computers, quantum computers may process information using qubits, which represent information in a complex vector space instead of binary bits. A qubit may represent, for example, without limitation, a zero, one, or zero and one simultaneously in a state of superposition. The mathematical abstraction associated with qubits may mirror the difference between classical and quantum states in physics. In short, the qubit may be used to improve the efficiency and power of classical computing methodologies with quantum mechanics.

Psychothotonix is the first technology/math model that defines and models reality as human consciousness (internal image states) in the brain interacting with external objective reality resulting in a new type of space-time diagram.

HISTORY

Dr. Richard Conner developed advanced models of human interaction with images (image processing) utilizing statistics and other mathematical tools for commercial and military applications over the course of his career. In his opinion, there is no other model that describes a brain space-time coordinate system which serves as an extension of the standard physical space-time model used in all areas of physics, until now.

The first application notes were used for applying human behavior to electro counter/counter measurements for the defense industry. Typically, a radar or laser measures a fighter pilot's coordinates in space and time relative to his desired target. However, the pilot's decisions may be influenced by enemy jamming, cloud cover and other distractions. This can lead to firing a missile or dropping a bomb on the wrong target and potentially resulting in great harm to innocent civilians. Dr. Richard and his team worked to counter outside influences with artificial intelligence driven decision models (advanced cognitive space-time models).

After working in military intelligence, Dr. Richard continued his work in the commercial sector developing a model of human cognition patterns with respect to measuring photonics parts. The parts could be displayed on a machine vision platform with precision (near photonic duplicate) for evaluation. However, the inspectors often make false positives and false negatives due to

© I Star Advanced Technology Special FX, Inc. All Rights Reserved.

human factor errors. Dr. Richard's award-winning machine vision system used software to help reduce the errors in physical space, time, and cognitive time. Dr. Richard's work also resulted in a movie script visually depicting the concepts of relativity. This script was captured on film in the Oscar winning movie, *Interstellar*. All of Dr. Richard's previous work contained elements of the psychothotonix model. This paper integrates a tensor-oriented model that is demonstrative of the principles of psychothotonix.

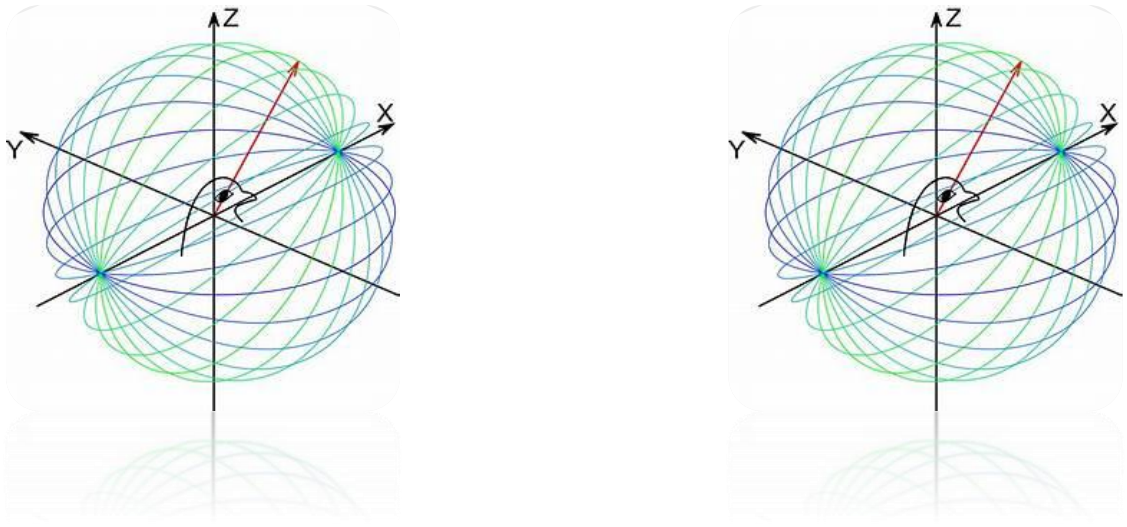
Over the past year, Dr. Richard trained Marcus Rodriguez on these concepts and co-created a book *Tetrastatum*, several white papers and application notes as well as a patent as it relates to the measurement and control of human perceptions and related human behavior patterns based on space-time imaging (psychothotonix). It is interesting to note, although he is not an academic mathematician and was never exposed to quantum mechanics or these ideas, Marcus picked it up very quickly and adds new creative ideas to the development of the model frequently. Marcus also obtained certification in Quantum Computing studying under teachers from Oxford and MIT. Granted he is extremely intelligent, but this tells me that this model also has great potential as a teaching tool. We all know the quantum mechanics of physics is virtually impossible to visualize and completely counter intuitive. However, this model expands the quantum logic to make it easier for people to understand. This primer informally discusses Dr. Richard's previous work including the more recent development of the model with Marcus Rodriguez.

WHAT IS THE MODEL?

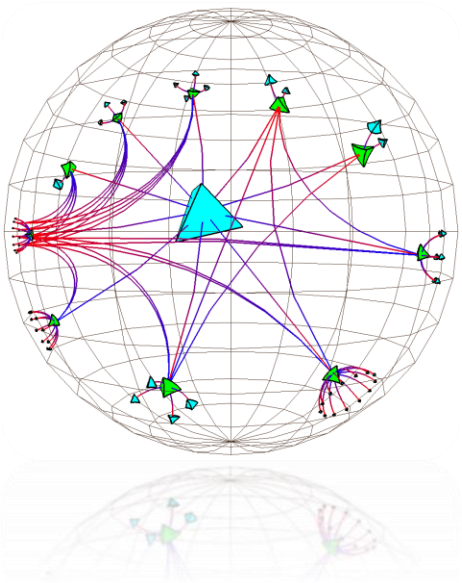
Psychothotonix is the measurement and control of human perceptions and related human behavior patterns based on space-time imaging. The brain may be thought of as a camera that takes images and stores them for many different types of interpretations of external reality —so the brain is an image processor with its own internal universe space-time coordinate system. The model introduces the brain interaction space-time mathematical model —a logical expansion of standard tensor calculus and quantum mechanics. One of the earliest dialogues that contemplates the natural circular flow between external objective images and the subjective internal contextual images in the brain is the *Timaeus* attributed to Plato circa 360 B.C. whereby the ill-fated nation state of Atlantis is conjured (see *Tetrastatum* pages 108-109).

The brain is composed of atoms that are quantum in nature and in some mysterious way emit light (photons) in the brain that somehow form images as well as image interpretations of the external world. However, even though the field of biopsychology based on the neurological study of this phenomenon is intriguing, it has no bearing on our model as it relates to measuring and controlling human perceptions. It is apparent that we all have images in our brain and that is what is important for modeling decisions, emotions, and behavior patterns. The mechanics of how the images form is irrelevant. By way of example, and not limitation, the system and method for quantum psychothotonix are principally directed to measuring and influencing emotional and behavioral states with implementations such as: enhanced advertising (increase ROI, conversion rates), four dimensional decision models taking into consideration human emotional/behavioral image states as they change in internal/external time-space, social and behavioral engineering, image processing beyond the Johnson Criteria-military intelligence and potentially a new type of quantum computer that maps external and internal image states. Consider the following example:

© I Star Advanced Technology Special FX, Inc. All Rights Reserved.



Time zero *Time one ……..*



At any time, or frozen in time……..

FIGURE 1.0 BRAINS INTERACTING IN SPACE TIME

The first figure depicts one "bird brain" interacting and moving in physical space time. Richard Feynman said, "coordinate systems are hard for humans to grasp as it seems counterintuitive to our nature". But, for a bird it is very natural for them as they maneuver in space-time as though they have a coordinate system locked into their brain. In this analogy the bird sees a physical point x, y, z at a time (t1), and almost instantly interprets how to reach that point at another time (t2) as the red pointing vector indicates.

The Psychothotonix (PT) model and camera technology are based on acquiring time series of human behavioral data or statistically deriving it from the quantum mechanical modeling

© I Star Advanced Technology Special FX, Inc. All Rights Reserved.

representing (B)ehaviour, (E)motions and (D)ecisions, which are the quantifiable coordinates replacing x, y, and z as points on a PT brain sphere. The brain sphere moves in physical space-time on some curve relative to the external image. Consequently, there is a mapping of B, E, D to x, y, z in time.

The second sphere gives you the image of your possible brain image interpretations at a fixed point in physical spacetime which are infinite by definition. The external image information comes into the brain and for the purposes of this illustration reflects off the right triangle pyramid brain mirror to points on your brain sphere. The internal brain image state can then be detected (the small pyramids) by others through physical space time using a PT camera, questionnaire or statistically derived based on the psychothotonix model. It is then received and processed in another brain in the same fashion as described above. The lines show an infinite number of paths can exist as the observer moves in time. In terms of brain tensor calculus these are PT space-time curves and follow the same mathematics as tensor calculus —of course with different psychothotonix interpretations of the solutions. The PT quantum computer can track these via the input from the observer. So, any observer can build these spheres by simply capturing the data with a PT computer!

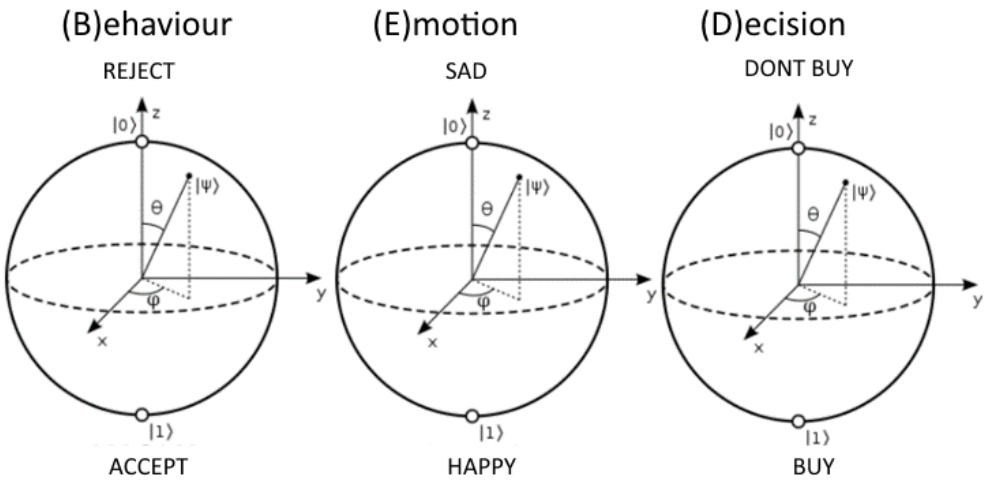
This PT spacetime coordinate system defines emotional/behavioral reality as viewed by a brain at a given moment I1(B), I2(E), I3(D). The orthogonal axis, moving in time is demonstrative of our unique duality methodology where all the coordinates are of unit length – the same coordinates for all human brains. The brain interprets external images from physical space time (x, y, z, t) as points on internal image spheres. Imagine a line R originating from the center of the sphere as a duality pointing vector, which symbolically connects to the persons interpretation of some external event. R is the vector that connects to some external image at a point in physical space time – both are orthogonal systems and have a unique mapping from one internal point to an external point in physical space-time. Finally, all people interpret any external objective image and even our own internal images (for example interpreting images from a dream) that can be described by these two coordinate systems.

Duality is the fundamental and non-reducible entity common to all human brains. This makes the coordinates extremely easy to understand and put into mathematical formulas that are an extension in logic to all existing math models of the external physical universe. Consider a simple example of defining a coordinate patch on the PT spheres as it relates to the example of deciding to buy a new car I3 (D, t) is one unit in length (1 = Buy, 0 = Don't Buy).

The decision is ultimately dualistic —I am going to decide to either buy the car or not at some point t in physical space time based on the relative internal time (i,t). In this example, assume the car salesperson has done a fair job of explaining the benefits of the new model versus my old car. It is electric and will save me money each month on gas, but he also says it has a limited range of miles before it must be charged. My decision state at t1 is mixed (superposition) as I am undecided whether I will Accept or Resist (behavioral state) the decision of buying. The salesman then explains it comes with lifetime free car washes, changing my mixed behavioral state from t1 to a pure state of "Accept" at time t2 upon processing the internal image (i,t2) of never having to

© I Star Advanced Technology Special FX, Inc. All Rights Reserved.

pay for a car wash again resulting in changing I1 (B, t2) to 100% accepting the idea of the decision to buy the car resulting in I3 (D, t2) "Buying" therefore:



SPHERE (2) SPHERE (1) SPHERE (0)

$$|\psi\rangle = \alpha\,|000\rangle + \beta|111\rangle \qquad \alpha + \beta = 1$$

I1 (B, t) = $|\psi\rangle = \alpha \frac{1}{\sqrt{2}}\,|000\rangle + \frac{1}{\sqrt{2}}\,\beta|111\rangle$ My internal image behavior state is "Undecided (½ Accept – ½ Resist)" due to the limited range of the electric car. (SPHERE 2)

I2 (E, t) = [010] / The internal image emotional behavior state is "Happy". I am 100% percent happy about buying the car, as I can picture it in my driveway (envy of my neighbors) and see myself driving it with a sense of pride and satisfaction. I feel good about it, but… (SPHERE 1)

I3 (D, t) = $|\psi\rangle = \alpha \frac{1}{\sqrt{2}}\,|000\rangle + \frac{1}{\sqrt{2}}\,\beta|111\rangle$ [0 = Don't Buy, 1 = Buy] I don't know what to do, I can see myself driving it, but I am going to have to plug it in on a long trip to charge, wasting time. Maybe it is not for me. (SPHERE 0)

I1 (B, t2) = [110] Free car washes, Accept!

I2 (E, t2) = [110] Still happy about it.

I3 (D, t2) = [111] YES! My decision is "Buy". Where do I sign, can't wait to park it in my driveway!

A quantum computer provides a probabilistic output in the form of a histogram with 2^n combinations (n= #PT duality spheres/qubits) after a predetermined number of shots. Alternatively, this example could also be represented as a simple vector in spherical coordinates. The points on the sphere are just (1, 1, 1). This represents an objective total interpretation of this external event, at a given "moment" when the vectors (data points) are captured on the PT computer.

© I Star Advanced Technology Special FX, Inc. All Rights Reserved.

Now, introduce duality to the scenario. Let us redo the scene in time. Suppose that I am at a car sales lot. I want to decide about buying a car, or not buying a car. In this example, the salesperson does a horrible job and I am grieving the loss of my pet hamster.

I1 (B, t) now also equals the dual opposite, 0 as I am not swayed into buying the car because the salesman did a poor job.

I2 (E, t) now also equals the dual opposite, 0 because I am 100 percent not feeling good because my pet hamster died.

I3 (D, t) now equals the dual opposite, 0, as I decided not to purchase the car.

The quantum computer output is [000]. The duality vector is (-1, -1, -1).

At home, I then enter this point relative to this experience on the PT computer.

The two vectors are dual opposite, as points on the PT sphere.

Now how about [110] / (1,1,-1)?

The salesperson did a good job, I decide not to buy the car I3 (D,t) = 0. However, I am 100 percent emotionally positive about it I2 (E,t) = 1, because my happiness does not depend on this external event.

At home I enter this point on the PT computer.

How about the dual opposite, [001]?

The salesman did a poor job I1 (B,t) = 0, I decide to buy the car even though I cannot afford it I3 (D,t) = 1 and emotionally 100% do not feel happy about it. I 100% feel sad I2 (E,t) = 0 because now I am broke!

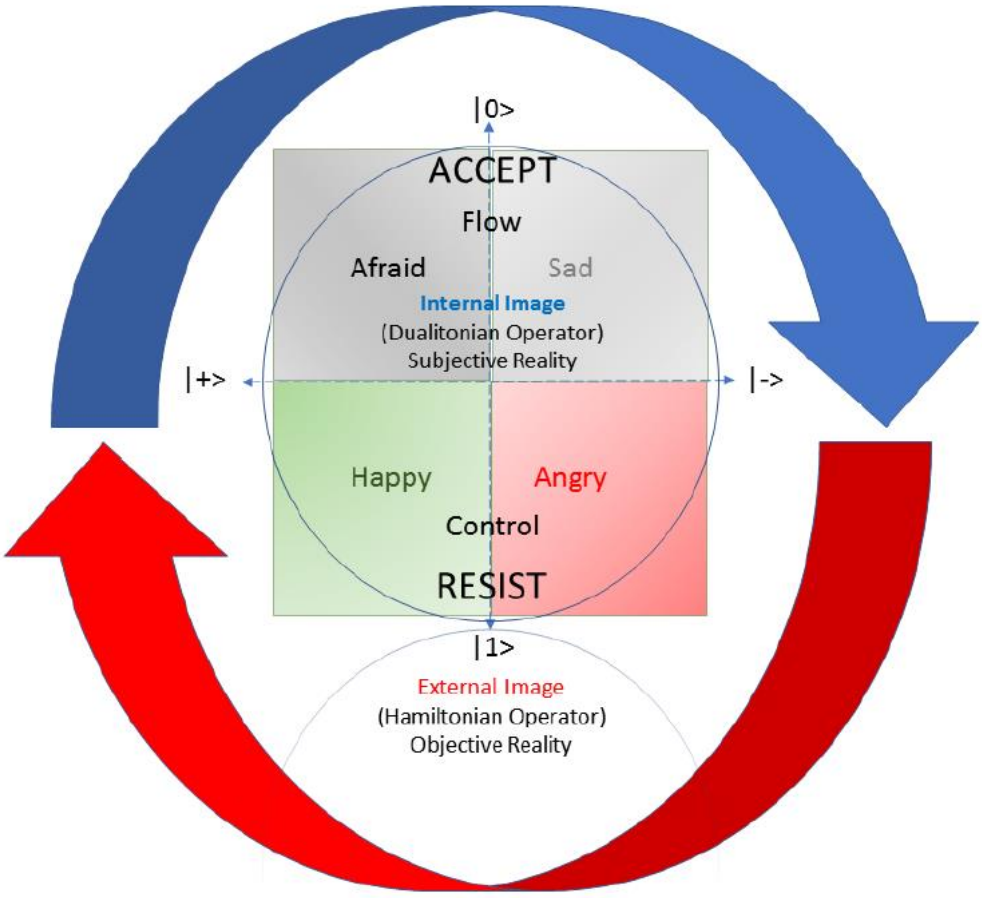
The B.E.D. data about my experience is measurable and recordable.

That is an example of the four quadrants with dual opposite vectors. Any experience can be modeled this way, there is no other way to put coordinates on emotional behavioral image states without this PT duality space-time! It is an irreducible coordinate system just as is the physical space time diagram. What makes it useful is that now we have the same mathematical structure for both and can thus build internal reality a step at a time as well as collect additional data points, previously unavailable. We can connect our experiences with the solid mathematics of tensor calculus but with two basic coordinate systems. One for the observer's brain and one for the observers mapping of external physical events. This is the first time in history where we have mapping of the internal and external events.

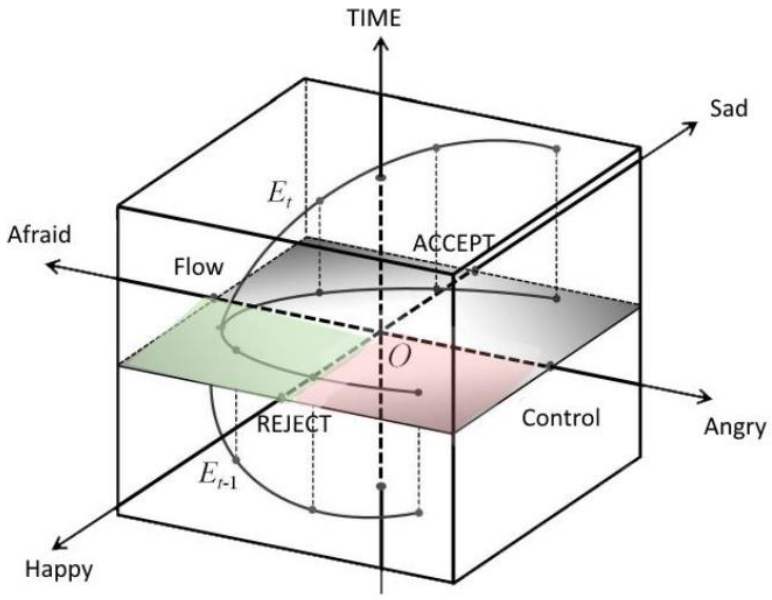
In fact, there are an infinite number of duality coordinates. The oldest surviving example of the acknowledgement of dualistic states may be found in the Table of Opposites of Pythagoras: finite/infinite, odd/even, one/many, male/female, right/left, rest/motion, straight/crooked, light/darkness, good/evil, square/oblong (see *Tetrastatum* page 62). Other common 100% dual opposites are: control/chaos, cooperation/conflict, agreement/disagreement, win/loose, trust/distrust, love/hate, pain/pleasure, right/wrong, good/bad, joy/sadness, surprise/anticipation,

© I Star Advanced Technology Special FX, Inc. All Rights Reserved.

trust/disgust, dominance/shame, pessimism/delight, anxiety/outrage, pride/despair, guilt/envy, hope/disbelief, honest/lying, resolution/blur -- as all of life revolves around dual opposite decisions, emotions and behavior patterns. Recent research suggests that all human emotional states are mixed states based on the duality of the pure states of Happiness/Sorrow and Fear/Anger. The following diagrams provide a good visualization of an expanded PT coordinate system which demonstrates how duality between the internal/external images creates a feedback loop consisting of behavioral/emotional consciousness on an individualistic as well as collective basis manifesting into reality.



© I Star Advanced Technology Special FX, Inc. All Rights Reserved.



Any dualistic image states may be modeled as points on the PT sphere. For example:

Cooperation versus conflict is the behavioral axis, 100% cooperative, I2 = 1. Your 100 percent confident that you made the right decision, I3 = 1. Emotionally your 100% feeling good = I1 = 1.

DIALOGUE FOR FURTHER THOUGHT

Marcus: Why are you using "I" to denote the coordinate system?

Dr. Richard: I stands for the observer's "thotonic identity" at the time of observation of the external event because we are capturing each I in a time series on the PT computer and or PT camera – a frame at a time. We define this as a person's identity. The previous images impact your perception of the present and future images. Over time the frames add up to your identity, which are also your image interpretations building up over time. This is how you perceive the external and this influences your interpretation of the meaning of life as the frames stack up. Your total I would be the sum of all I (time) from birth to death.

Marcus: So, this image stack (internal images) that is a person's "thotonic identity" interacts on a sub-conscious level with current external images forming consciousness or subjective reality? It is an easy way to define these typically abstract concepts. It makes it simple to define many of these philosophical concepts and forms a new basis for defining many things in psychology as well. How do you define other points on the sphere?

Dr. Richard: The shutter speed of the brain is the time between image interpretations. This is just a sphere where I3 = rcos(Θ), I2 = rsin(Θ) sin(φ) I1 = rsin(Θ) cos(φ). So, a person could have any degree of interpretation of all duality's external events.

© I Star Advanced Technology Special FX, Inc. All Rights Reserved.

Marcus: How does the PT computer track points on the sphere?

Dr. Richard: A person could enter data manually on a psychothotonix questionnaire creating a path of points curving this way and that way. It is a trace of points on the sphere. The basic idea is that the curve in tensor math is easiest to calculate using the first fundamental form. The curve is just ds (t)/dt where ds(t)/dt is the arc length along the path on the sphere and ds^2 = the metric tensor g (ij)dI(i)dI(j). So, s is just the time integral of the square root of the first fundamental form – a super easy equation to program. A quantum computer-based embodiment of PT technology applies gates: Hadamard, R(X), CNOT, (X) to qubits (PT Spheres) based on direct responses to the PT questionnaire or direct input from a hyperspectral camera. As the utilized quantum gates are unitary, users could plot this out relative to outside stimulus by reversing the gates to show how they moved along on their brain spheres. Quantum gates are unitary, because they are implemented via the action of a Hamiltonian for a specific time, which gives a unitary time evolution according to the Schrödinger equation.

Marcus: You said that the brain sphere is really in Hilbert space-time then that must mean there are imaginary numbers.

Dr. Richard: Yes, there are but for practical reasons given above you can just use a real valued sphere on the computer. Using the formula, above applying tensor Calculus does not really work for imaginary numbers. The approach that uses quantum computers (qubits) mapped to emotional, behavioral image states can incorporate complex polar coordinates on the PT sphere.

Marcus: You talked about cognitive uncertainty in other works. Can you give me a simple example?

Dr. Richard: Here is a simple example. When someone types into the computer their I3 coordinate at that moment, they are not thinking about the other two coordinates, so I3 is certain, and the others are completely uncertain. If you pin down one coordinate the information of the others goes to zero. Thus, this is like the uncertainty principle in quantum mechanics. If you pin down the position of a quantum particle then the time information is lost. You don't know where the particle is in time.

Marcus: Why hasn't anyone else thought of this internal image coordinate system? It seems so logical.

Dr. Richard: Understanding that all external events are juxtaposed with internal emotional, behavioral states embedded in duality is something that I thought of and used for a long time in my psychology seminars. But expanding it into the three dimensions is a complex thought process. Also, Hume and Locke ingrained that only the space-time model of the external physical universe is important because you can use the scientific method to get experimental results. This has been the focus of almost all models until recently. The idea back then was correct in that many people were just making up models that could not be validated which is really a dangerous thing to do. So, my motivation was to model image interpretations in the brain. However, without duality it is not possible to quantify these nor measure these with experimental data. A coordinate system simply didn't exist until now. That is why so many models in psychology fail. All interpretations

© I Star Advanced Technology Special FX, Inc. All Rights Reserved.

of the external world are based on this duality principle. You must figure out the unit sphere in the complex plane. I thought of this from Reiman who mapped arbitrary physical points to a circle in the complex plane via conformal mapping. I also was influenced by Richard Feynman who mapped a unit sphere as containing all the probability amplitudes of anything. In addition, the Poincare sphere is a real number sphere which has all the possible states of polarization of photons on the surface of the sphere. Finally, I thought of the unit magnitude Bloch sphere used in quantum mechanics to model atoms jumping from one energy level to the other. I was working a long time on human interpretations of events as mentioned above.

Marcus: In one of the current popular models of quantum communication (Superdense Coding-Teleportation) between observers, people use the Bob and Alice entanglement concept utilizing bell states. Will you give me a simple example?

Dr. Richard: Yes, consider a point (1,1,1) in Bob's brain relative to any external event interpretation. Assume Alice who is halfway around the word had the same interpretation of the same event in her brain.

111 = 111 on the two spheres. This is called a bijective mapping because either of them can communicate back to each other and maintain the same result. They are entangled. Assume that this mapping happened via the speed of light over the internet. Now Bob sees another point and Alice automatically sees the same point instantly. Their brains are entangled with instant communication! This is similar logic that quantum computer experts are pondering. Once one state of anything is chosen, the other is instantly locked in at infinite speed, essentially. It gets a little more debatable, but the idea of brains being able to communicate at an instant no matter how far apart they are is intriguing.

In terms of math, the mapping is one to one, homogenous, and the Jacobian and its inverse product is I, the identity matrix. So, to expand the concept of I is just what I said, they have the same I, 111 = 111! Kind of interesting.

Marcus: What is the value of the vector (2, 2, 2)?

Dr. Richard: The magnitude of the sphere is one as it crosses the I1, I2, or I3 axis – true for a unit sphere, even though points on the sphere are not of unit magnitude because a sphere is based on curvilinear coordinates and the metric tensor and the derivative of the metric tensor in a curved surface change as one "thinks around the surface" So, this point is "outside – or out -- of the brain."

Marcus: As a final note why is the quantum computer such a good match for the PT sphere?

Dr. Richard: This is one of the most amazing things! The quantum computer works based on a unit spherical model in physical quantum mechanics. Photons can be mapped to points on the quantum Bloch sphere via laser technology. The brain does the same. It maps brain photons to brain interpretations on the unit brain sphere. What a great match – a marriage made in heaven! The brain is a quantum image processor!

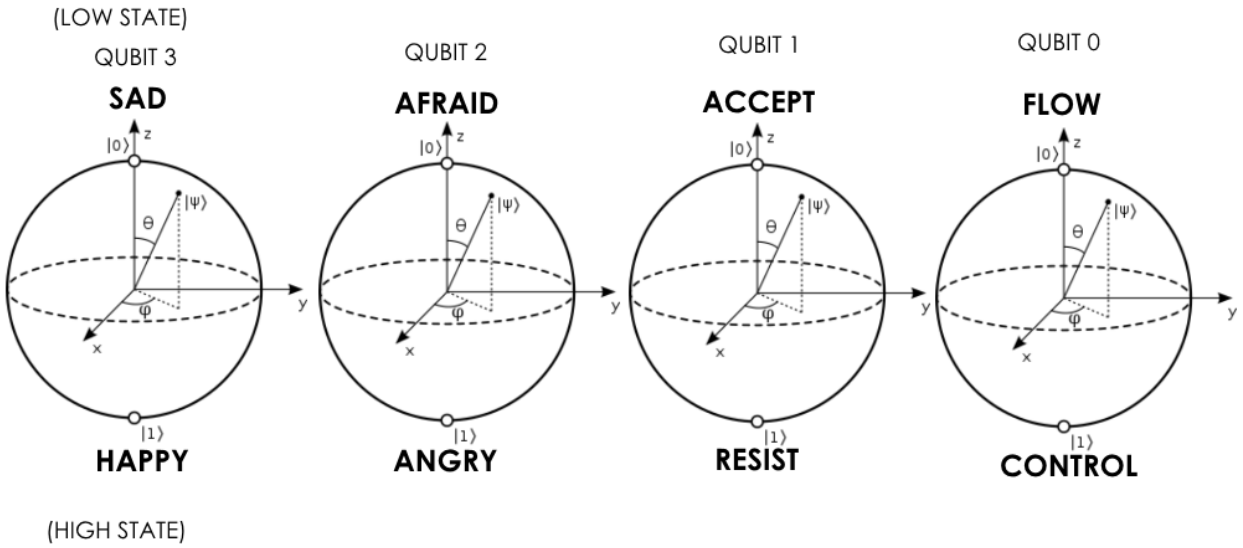
Anyway, as a final thought. Since the two work in harmony, this would allow billions of people to look at an image and have our PT camera on their PC (called a hyperspectral camera) that interprets

© I Star Advanced Technology Special FX, Inc. All Rights Reserved.

their I1, I2, I3 without the need for a questionnaire. So, the "world brain sphere" can, at a flash of light, have billions of real-time vectors on the brain sphere.

The following wave equation and Bloch-Sphere representation is demonstrative of a four-qubit model of human emotional and behavioral states:

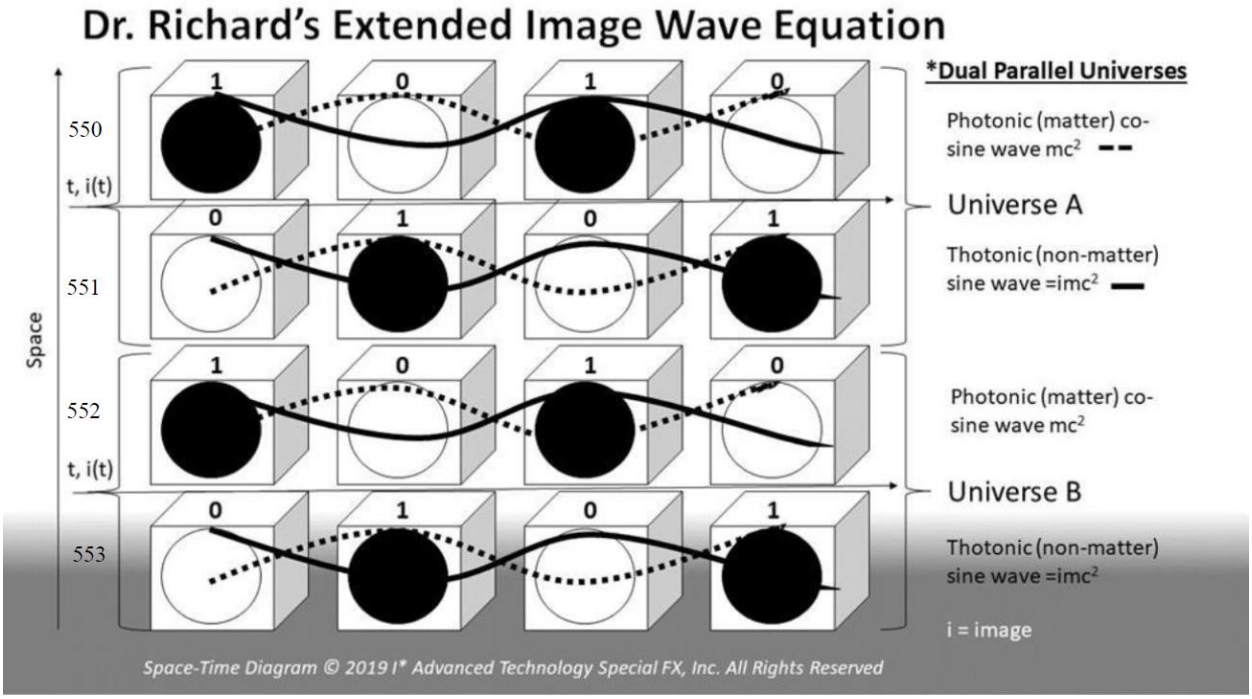
$$|\psi\rangle = \alpha\,|0000\rangle + \beta\,|1111\rangle$$



Now let us jump to a more sophisticated example that is the underlying premise of the PT methodology on the following page:

[INTENTIONALLY BLANK]

© I Star Advanced Technology Special FX, Inc. All Rights Reserved.



$$[<> \{0,1\}], [1], [0], [\{0,1\}] = \pm\infty$$

The first 550 and second 551 timeline images demonstrate the principle of duality between the external and internal image universe. In the first timeline 550, the single photon psychothotonix camera 100 percent resolves the external universe quantum particle (solid circle) and the probability amplitude of the duality wave is cos = 1, the mass is real, mc2.

In the second timeline 551, the brain 100 percent resolves the internal universe quantum particle from the camera (solid circle) and the probability amplitude of the wave is i sin = 1, the mass is considered imaginary, imc2. Consequently, the probability amplitudes fit as vectors on a unit sphere in the complex plane (Hilbert space).

In the first 550 and second 551 perception equations, the instantaneous amplitudes in time (the derivatives) depend on the two image processing events (camera and brain) (coupled differential equations, $\omega 11$, $\omega 12$, $\omega 21$, $\omega 22$, t,it and -t,-it).

$$dP+(t)/dt = i \times \omega 11 P+(t) - i \times \omega 12 P-(t)$$

$$dP-(t)/dt = i \times \omega 21 P+(t) - i \times \omega 22 P-(t)$$

The omegas (ω) are the frequencies of the two single photons entangled in the process and the (empty circles) represent the quantum shutter speeds (camera and brain) of the external and internal universes —related by planks constant divided by the single photons energy differences. The other two timelines 552, 553 are relative to another person "Universe B", which can be called a dual parallel universe ad infinitum (Universe A,B,C,D….).

© I Star Advanced Technology Special FX, Inc. All Rights Reserved.

MODALITY OF CONSCIOUSNESS

A Probabilistic Image Wave Frame Rate

INTERNAL IMAGE WAVE

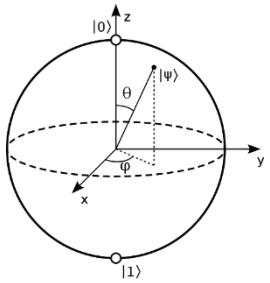
SUBCONSCIOUS

COLLECTIVE UNCONSCIOUS

DREAM STATE

INFINITE

$|0> = \pm\infty$



$|1> = \frac{\hbar}{\Delta E}$

FINITE

AWAKE

CONCSCIOUS

EXTERNAL IMAGE WAVE

The image frame rate of the brain can be zero as well as ±∞, as such it could also be the same frame rate as a camera (ie a photonic duplicate of the external image creating a reference point of objective reality). But the image rate of the camera is thus far limited to $\frac{\hbar}{\Delta E}$ (the energy it takes to switch frames between single coherent photons scattering off the quantum particle —the shutter speed of the universe. $\frac{\hbar}{\Delta E}$ is in units of joules-seconds. Energy ("E") is in units of joules. So, $\Delta t = \frac{\hbar}{\Delta E}$ the frame rate of the brain can yield internal time like space that may be incongruent with the external frame rate or external light-like images congruent with the external frame rate. The frame rates are probabilistic and relativistic. Consequently, a person can interpret the blend of these images (internally) as past, present, or future moving in a positive (forward) or negative (backwards) direction in a non-linear, random or coherent fashion. The brain's light cone is different than the external light cone. The frame rate of the camera from this point of view is $\Delta t = \frac{\hbar}{\Delta E}$ which can be set to a unit value when the camera is working at the quantum shutter speed of the universe —two single photons from a perfect coherent laser source. This model is thus an expanded version of the Schrödinger equation and wave function.

© I Star Advanced Technology Special FX, Inc. All Rights Reserved.