The Quantum Brain

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For many years the world has falsely believed that quantum physics is limited to the world of quantum particles. However, resent research into the brain's natural intelligence process has shown this not to be true. The brain is a quantum process, but is not a quantum device. The brain is far too hot to be a quantum device. The brain uses neurons, not quantum particles, to form a quantum entanglement to translate the enormous amount of sensory data into intelligence. The brain maintains a quantum state that produces real-time awareness where life can recognize its own existence at any moment in time. It uses that awareness to solve the big physics riddle in that entropy (uncertainty) can never be defeated and over time always increases. In the brain, sensory data is converted to entropy and intelligence evolved to decrease it over time as a matter of simple survival. The less entropy, the greater the survival rate.

<u>The Illusion of Time</u>

Understanding the brain's quantum process first starts with realizing that time is an illusion and there is no universal time. Time is created by an observer to measure their own existence and the length of that process cycle creates time. So, if it takes one second to measure your own existence, then in a minute, you will have 60 moments in time. If it takes only 1/10 of a second, then you will have 600 moments. Time is only relative to the length of the observer's process cycle. Different observers see the universe differently, some faster, some slower. The brain uses the different time relativities to use quantum mechanics to integrate its different processes into a single, highly efficient system for producing intelligence to eliminate entropy.

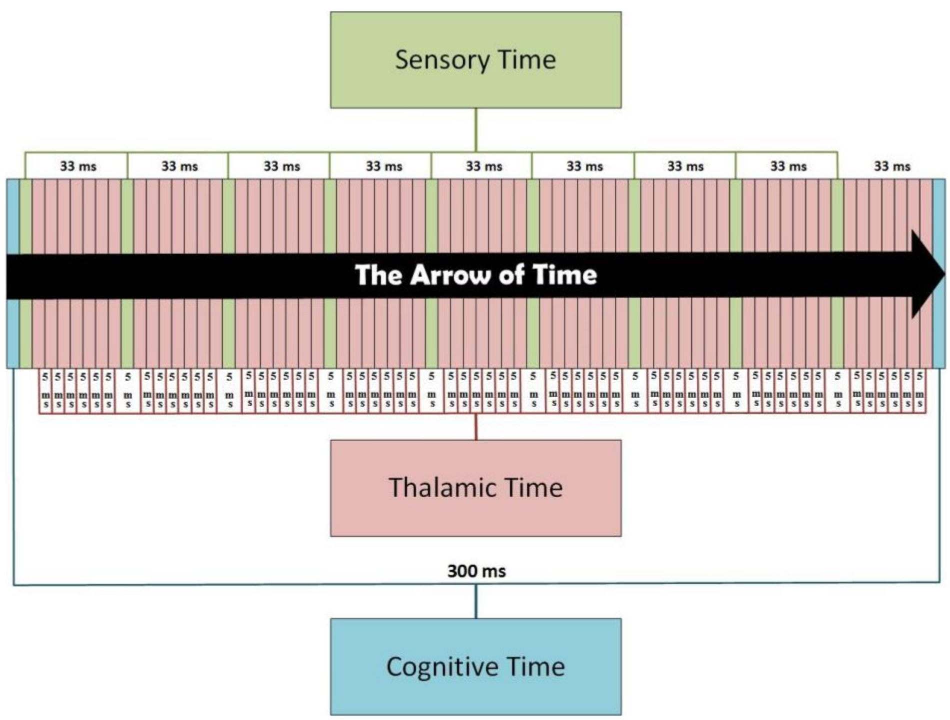

Figure 1 – The Time outside of Time

Since time is created by the process cycle of the observer and the length of that cycle creates time relativity, the brain's different processes run at different cycle speeds to enhance its data processing capability. These different processes experience time at different rates. A sensory system such as the eyes cycles measurement around 33 milliseconds, the conscious process of the frontal lobe cycles at 300 milliseconds, and the subconscious process of the thalamus cycles at 5 milliseconds. Three different observers experiencing time differently. A time outside of time, as depicted in Figure 1, where other processes operate beyond an observer's perceptual boundary in a different time relativity.

General Relativity Meets Quantum Mechanics

The brain capitalizes on time relativity to create a quantum process to connect the different processes of the brain into a single system. The thalamus, being the fastest of the brain's many processes, functions as a bridge allowing the different observers to synchronize to a deterministic state within their own time frames, as depicted in Figure 2. The thalamus establishes a quantum state and entangles that state in all of its connected cortexes. The entanglements control the linear firing sequence of the brain's intelligence process, so each component executes in the correct order against a single state of data within the same process cycle. The brain is functionally an engine and the thalamus acts as the timing gear.

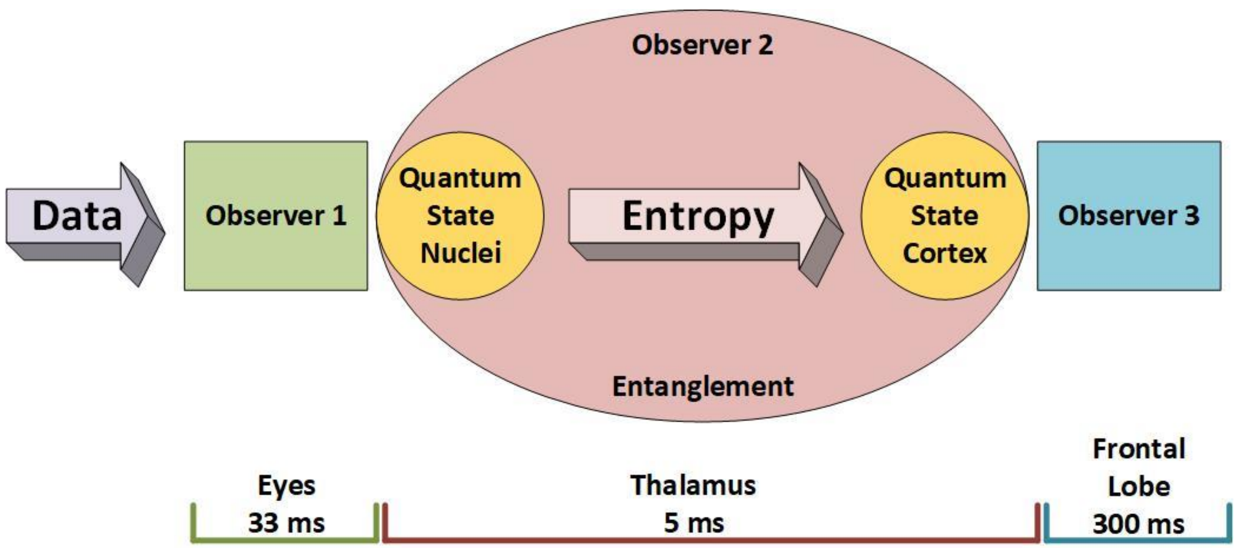

Figure 2 – The Brain's Quantum Entanglement

So, the eyes (observer #1) every 33 milliseconds measure their input sensory data to create a moment in time. Since creating time is a linear experience, the Observer #1 measurement will establish the boundary of that moment, which includes when the moment begins, when the moment ends, and the linear sequence of its data. This information is then feed into the thalamus (observer #2) which will perform its own separate measurement of that moment to identify the entropy in the sensory data. Entropy is uncertainty, randomness, disorder; it is data that has not been predicted. The entropy represents chaos in the data stream and is the only data that matters. Non-chaotic data is in a state of order and since it is deterministic, requires no further representation in the data stream. The thalamus identifies entropy by simply taking the neuron with the current sensory data and XORing it with a neuron that contains the predicted sensory data. The thalamus conducts it measurement based on the original observation cycle of the sensory system (33 ms), not its own process cycle (5 ms). This creates a data payload of synchronous entropy that preserves the original sensory observation in its original time relativity. Basically, a frozen moment in space-time.

With the moment in space-time captured, the thalamus transfers the synchronous entropy through a synchronous communication channel. The synchronous communication allows the thalamus and the connected cortex to share the quantum state and function in an entanglement relationship. Now, synchronous observation data traveling through a faster synchronous communication process creates a theoretical *time tunnel* where the observation is tunneled through a separate process outside of the time relativity of the observation. This allows the brain to reproduce what Einstein called *Spooky Action at a Distance* and the industry calls *quantum teleportation* where data instantaneously appears in two points separated by distance simultaneously relative to the observation. This unique characteristic of the brain is that it uses quantum principles such as entanglement and entropy without the need to be a quantum device or be dependent on quantum particles. In fact, the brain's quantum process explains the measurement problem in quantum mechanics. The quantum state of the brain is only in superposition when the entropy is being transferred through the entanglement. Since this transfer is occurring at a faster time relativity, an outside observer never sees a probabilistic state, only a deterministic one.

In the brain, the quantum state in the thalamus (observer #2) represents the state of all sensory data at any given moment in time. In order to become aware of the environment, the frontal lobe (observer #3) must connect to the data in that quantum state. The frontal lobe where consciousness resides is functionally responsible for adaptations when entropy has been detected and new predictions are needed. Observer #3 is running much slower than observer #1, so 9 moments in time will be measured by observer #1 before a single measurement can be performed by observer #3. As a result, observer #3 will conduct its one measurement on all 9 observer #1 moments in time concatenated together.

This entropy concatenation has several major advantages. First of all, it forces observer #3 to measure data from a top-down perspective because one of its moments in time equates to 9 moments in bottom-up observer #1 measurements. Top-down provides the needed analytical perspective necessary to understand and make adaptation to entropy. Secondly, concatenation provides the prediction sequences needed by observer #2 after adaptations are selected. Observer #3 with the top-down perspective may see the adaptation as moving their right arm to catch a baseball where observer #2 just sees a series of prediction sequences that it uses to measure entropy. Thirdly, the combined elements in the observer #3 measurement create a very unique data pattern signature that details the experience and provides the ability to further concatenate observer #3 measurements. This produces sequences of sequences that becomes the foundation for the construction and indexing of episodic memory. Finally, episodic memory contains the predictions for many moments into the future which the brain uses to process an event before it actually occurs allowing the entire mechanism to operate faster than real-time. As it turns out, time dilation is no disadvantage. It is a method for reversing Issac Newton's Laws of Motion in that every action has an equal or opposite reaction. By going faster than real-time, the brain creates reactions before an action can actually occur which allows life to survive in a changing environment.

A Quantum Process on a Classical Computer

Since the brain's process is not restricted to quantum particles, the algorithm can be duplicated on a classical computer, Patent #12,242,923. The quantum process begins by reproducing thalamic function using a Motion Decimator device. The Motion Decimator establishes any form of computer memory (bit encoding) as the quantum state and it will use that state to entangle a second device called a Motion Reactor which reproduces the function of a brain cortex and establishes matching computer memory as depicted in Figure 3. The two devices exchange data synchronously using a measurement cycle time that is at least twice as fast as the observation cycle time.

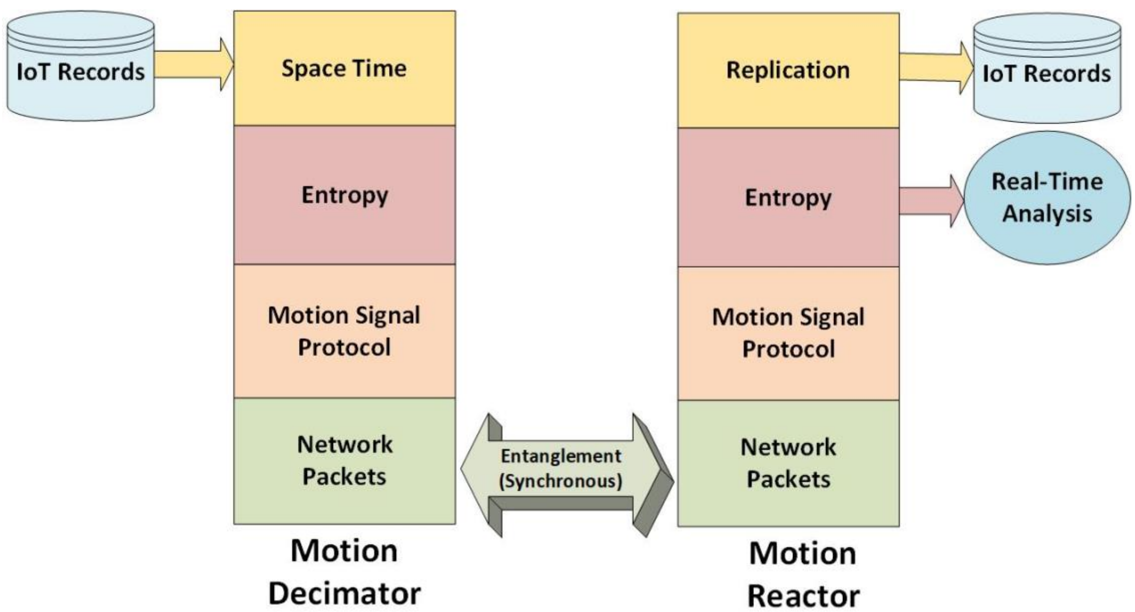

Figure 3 – Classical Computer Implementation

For each measurement cycle, the Motion Decimator will process the data from the observer. The observer may be a relational database, a multi-protocol router, an individual computing device, or any form of buffered data. The Decimator measures the data state against its predicted state to extract the data entropy and applies it to the quantum state. The data entropy is encoded as a set of motion signal instructions that explain the steps necessary to apply the chaos to the quantum state to keep it synchronized. The Motion Decimator compresses, encrypts, and transmits the entropy across a computer network to the entangled Motion Reactor. The Motion Reactor runs on-demand which means that it does not queue inbound data; instead, it synchronously executes the data in real-time. As the instructions are received, the Motion Reactor processes the entropy into its quantum state and when done notifies the Motion Decimator. This notification certifies that all the entropy has been successfully applied and the entangled quantum states are synchronized which completes the Motion Decimator's measurement cycle.

Figure 4 shows the benchmarks for processing sensory data for a set of 2000 IoT devices. The observer is a relation database sitting on a multiprotocol router. The Motion Decimator measures the IoT data for entropy and uses quantum teleportation to synchronously send the entropy to the Motion Reactor which reproduces the data in another relational database. The numbers clearly show that a majority of the IoT data exhibits no entropy and requires no transmission. Normal processing produces 240,000 network packets, where quantum teleportation only requires 124 packets to move the same information.

The benchmarks were produced using a single prediction sequence. When greater prediction sequences are applied, such as the 9-prediction sequence found in the brain, expectation is that efficiency should jump significantly further. It is a system where intelligence produces prediction sequences that continually decreases entropy over time resulting in a corresponding decrease in data volume and energy usage.

Sensor #	Entropy % (Target) (Achieved)	Cycles	Traditional (Records) (Fields) (Data) (Packets)	Decimated (Records) (Fields) (Data) (Packets)	Record Reduction	Field Reduction	Data Reduction	Packet Reduction
2000	2% 2.84%	60	120,000 1,320,000 11,240.4K 240,000	3,719 5,743 18.26K 124	96.90%	99.56%	99.84%	99.95%
2000	5% 4.81%	60	120,000 1,320,000 11,240.4K 240,000	4,913 6,954 22.09K 124	95.91%	99.47%	99.80%	99.95%
2000	10% 10.79%	60	120,000 1,320,000 11,240.4K 240,000	8,532 10,630 32.72K 124	92.89%	99.19%	99.71%	99.95%
2000	25% 24.33%	60	120,000 1,320,000 11,240.4K 240,000	16,722 18,968 53.32K 124	86.07%	98.56%	99.53%	99.95%
2000	50% 49.81%	60	120,000 1,320,000 11,240.4K 240,000	32,098 34,629 88.12K 146	73.25%	97.38%	99.21%	99.94%
2000	100% 97.57%	60	120,000 1,320,000 11,240.4K 240,000	62,000 65,995 149.45K 146	48.33%	95.00%	98.67%	99.94%

Figure 4 – Transmitting IoT Data as Entropy through an Entanglement

The benchmarks clearly show that duplicating the brain's quantum process produces a quantum leap in data efficiency without quantum particles or quantum devices. It uses a standard computer running across a standard computer network. Advantages of a quantum process running on a classical computer:

1. No zero-temperature requirement – A quantum computer must be cooled below room temperature. A classical computer can run hot with no degrading effects on its quantum process.
2. Fragility free – Quantum states degrade quickly (memory decoherence) and are unduly affected by environmental noise. A quantum state on a classical computer rarely degrades and environmental noise is filtered out.
3. No read limitations – Measuring qubits collapses their quantum state, preventing back-and-forth interaction. The quantum process on a classical computer is composed of bits that can be read without degrading the quantum state encouraging back and forth communication.
4. Automatic resynchronization – The timing of a quantum computer must be very precise and cannot be altered. The quantum process on a classical computer is precise but allows variance in the timing to accommodate environmental changes by automatically resynchronizing the quantum state.
5. No I/O Bottleneck – A quantum computer has limited bandwidth which restricts the amount of data that can be processed. The classical computer converts all data to entropy which reduces bandwidth requirements by over 99.9% allowing enormous amounts of dataflow into the quantum process.

The Thinking Paradigm

The quantum efficiency of the brain and the Motion Decimator speak to a greater truth. Thinking is not the same as talking. Everything that has been built in computer science, artificial intelligence, and information processing to date has been based on a talking paradigm. We send and process one character at a time, one word at a time, one sentence at a time, one record at a time. All computer systems have this language conversation model built throughout their communication and processing architectures. Much has been accomplished with talking, so it is not surprising that the latest form of artificial intelligence is a language model. However, talking exacts a tremendous price in the form of time and energy. It is a brute force method for moving data, performing analytics, and building intelligence.

Thinking is an evolutionary form of data processing that is highly energy efficient and facilitates real-time awareness of the environment. The human brain weighs 3 pounds and doesn't use more than 20 watts of power. Thinking reverses the talking paradigm by changing the perspective of data processing to assume a perfect world. In the perfect world, everything that is perfect need not be communicated and can be assumed throughout the thinking process. This reversal of paradigm means that most data can travel without substance, no characters, no words, no sentences, no records. As a result, no energy is required to move the knowledge of that perfect world. It is deterministic by nature and requires no interpretation or analysis.

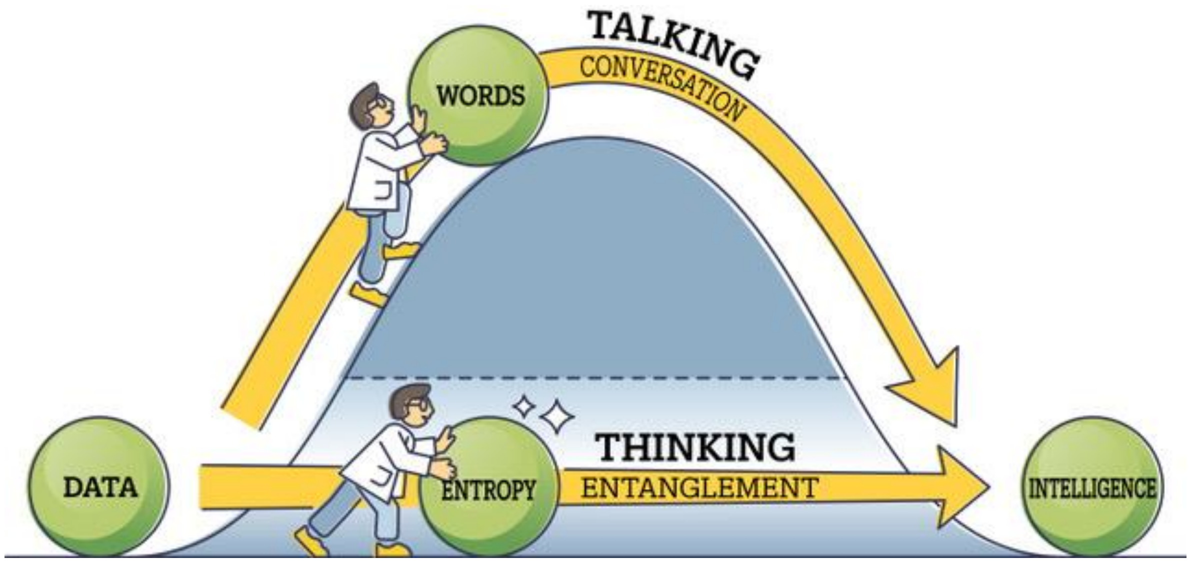

***Figure 5* – Thinking versus Talking**

To facilitate perfect world processing requires that the brain identify the data that is not perfect. This is entropy and it is data in a state of disorder, its unpredictable, it is chaotic. This is the only data that needs thought production. The other data is perfect which implies that thought production has already occurred and its entropy has been eliminated. This is the reason why when someone walks into a familiar room, anything that is different will be immediately identified. Entropy requires only a fraction of a fraction of the energy required for talking. It is beyond just filtering data. To filter data implies the permanent removal of data from the data stream. An entropy encoding removes the data but carries the knowledge of the removed data within it. The data theoretically exists but without substance. Entropy is the reason that the brain can process enormous amounts of sensory data so quickly creating real-time awareness and automating the motor cortex.

Conclusion

The brain is nature's most evolved method for processing sensory data into intelligence. Intelligence is nature's method to increase survival by decreasing entropy present in the environment. Its evolution is governed by need and strict energy conservation. The brain is faced with a daunting challenge which is the enormous amount of sensory data that needs to be processed into real-time awareness so reactions can occur. To conquer this problem, the brain mixes general relativity with quantum mechanics to create a system for moving spacetime through an artificial quantum entanglement. By converting the spacetime to entropy, it can use quantum teleportation to move the data inside of the entanglement. The efficiency of the brain's quantum process allows it to exceed the physical limitations imposed by the amount of sensory data while maintaining its strict energy conservation.

The brain's quantum framework dictates that the substance of all thought is entropy. It is entropy that creates the awareness that is then used by higher intelligence to classify and resolve either through adaptation or de-prioritization. In either case, intelligence is providing the needed predictions to eliminate entropy which removes any further energy requirements. It is this self-perpetuating energy conservation process that gives rise to intelligence and the levels that are needed to ensure survival. All lifeforms, even those without brains, such as plants and single cells measure, communicate, and process sensory data using some form of this energy conservation technique. Intelligence is the only process in the universe that decreases entropy over time.