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Sense and Motion: The Barrier Preventing Us from Understanding Motion

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Abstract

Currently, scientific study and advancements are at odds with the natural motion systems that surround us. This paper explores how it is our sensory form and the cognition developed upon this sensory form that creates a barrier preventing us from truly understanding the laws of motion. It begins by isolating and defining two distinct forms of information and information processing mechanisms: motion information and integrated information. From this new perspective, it then explains how our sensory system is necessarily based on an integrated information mechanism to support basic survival needs, but is essentially blind to the true features of motion. The far-reaching effects of this discovery include the limitations within our cognitive mode and the current methods of scientific study and development.

Keywords: Cognition, Integrated Information, Sensory Limitations, Motion Form

Introduction: A new understanding of the form of information that our sensory processing system uses to develop cognition explains current barriers towards understanding natural motion principles.

Main Text:

Part 1: The Form of Cognition

The world we live in is in constant motion. However, we observe the world in a special way. From our sensory frame of reference, earth, we perceive the ground as static and motion as being relative to the earth. However, on a moving train, our frame of reference for stillness becomes the train, and movement is relative to the train. The ability to build these static frames of reference requires our sensory system to essentially block out the sense of continual motion. We accept this quirk as natural, without considering that our sensory view can't reflect true states of motion. The motion we sense is not real motion. We face a lack of understanding of our basic cognitive form and its relationship with motion reality. Our cognitive form limits our cognition; only a bird's eye view, which steps out of our current cognitive mode can help us to clarify the principles and limitations of our cognition. This idea leads to a perspective wide enough to view two types of cognition, based on two different forms of information.

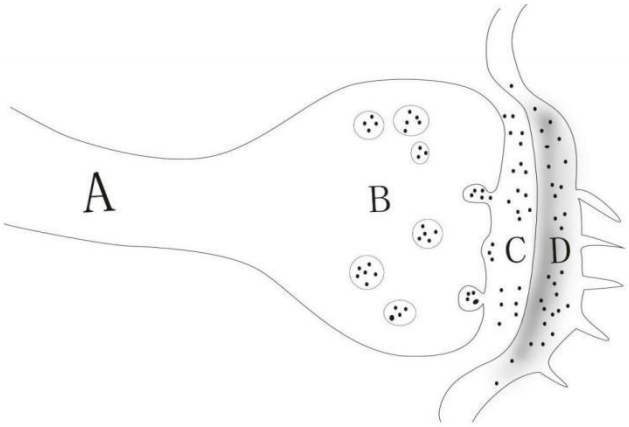
One is the type familiar to us: the integrated form of cognition. This type of cognition is based on integrated information. For example, images are pieced together by pixels, and video is formed by updating images. Another type of information is the motion form. It is continuously developing and is the true form of the natural world. So far, humans have been lacking an effective way to cognize the true form of motion.

The integrated form builds upon fixed and scattered units of information. It is non-motion and is distinguished from the motion form by its principle. This is also the reason that cognition based on this form of integrated information is static. The relative changes of static information can create a sense of dynamic motion, as can be seen in video footage. We can consider that the movement we sense simply changes in the non-motion form of information. This is distinctly different from true motion, and it doesn't contain motion features and mechanisms. I call this virtual motion. However, 'motion', as will be mentioned in my research, all refers to the true motion form, not virtual motion.

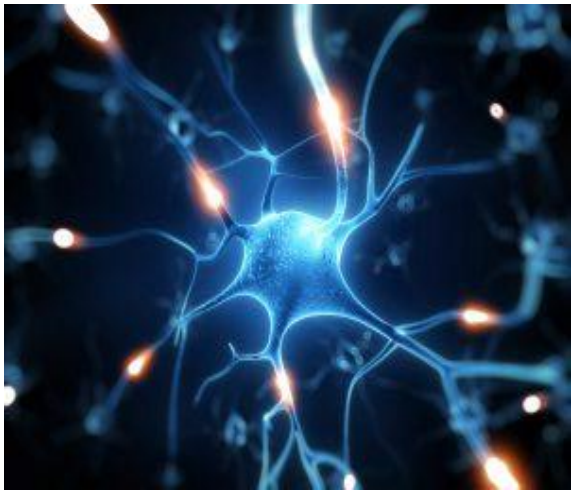
The forms of motion and integration have essential differences. The basic principle of integration is scattered (non-continuous) and fixed (non-dynamic). Our sensory system portrays a sense of both static and virtually dynamic. Only a non-motion form of information could support this type of cognition and keep stable cognitive references in a world of motion. In other words, our sensory forms have to be based on integrated information, which is distinctly different from motion information. Neurology has discovered the basic processes of neural activities. However, due to a limited perspective it has not come up with understanding of the principles of sensory info process.

Part 2: The Integrated Senses

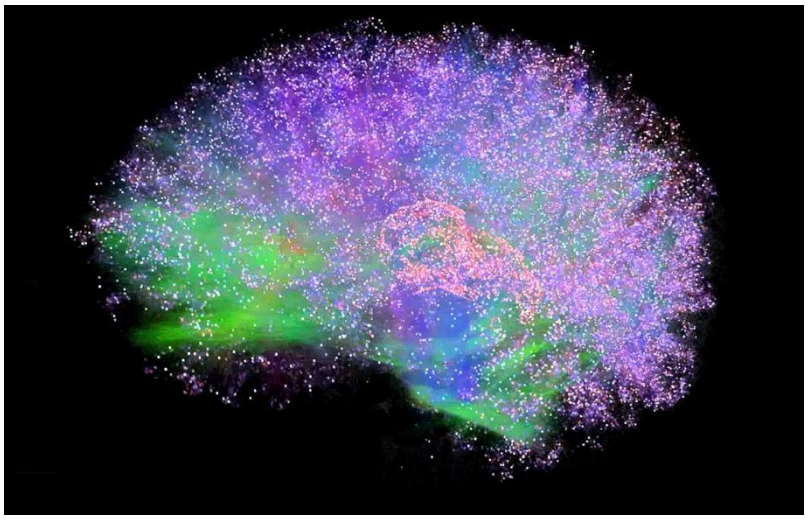
The integrated information we are familiar with is based on information units, an integration platform, and a mechanism for updating information. For example, in photographs or video footage, electrochemical or photochemical reactions form chemical pixels. Then, a platform, such as a display, supports the stable arrangement of the pixels. Finally, there is a mechanism for updating the information units. If sensory processing systems also utilize information integration, then we should also see these same principles and features as applied to our senses. First, let's explore electrochemical reactions. In neural activity, electrical currents that pass through the nervous tissue (Zone A, in the figure below) are not continuous. There are distinct gaps, known as synapses, between individual nerve cells where electrochemical reactions occur.



Zone B shows the chemical 'units' located just before the gap between the two nerve cells. After those units have been stimulated by an electrical current, they release certain chemicals, at Zone C. These chemicals then cross the gap and can stimulate a new electrical current to begin at Zone D. Through these electrochemical reactions, the resulting chemicals form information 'units' in the synapses. The second essential element is the integration platform. Due to the three dimensional structure of nervous tissue, synapses are arranged in a three-dimensional array, which supports three-dimensional sensory forms.

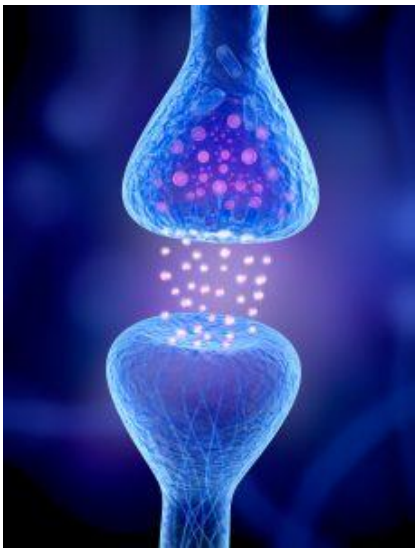


The third element is information updating. Like on an LCD platform, the electrochemical reactions involved in neural activity are also 'updated' at a certain frequency. We can see the activities of sensory nerves are fully supported by and meet the requirements of a 3D information integration process.



There is a myriad of nerve cells and a thousand times more synapses within our nervous system. Information units are integrated with a 3 dimensional structure, actualized by multi-stage electrochemical reactions. The nervous system is a textbook example of a 3D integrated information processing system. Therefore, the electrochemical reactions we observe in the synapses are producing and updating the sensory information units.

The biggest misunderstanding in neuroscience is the function of synapses. From observations of anatomy, neuroscience considers synapses as connectors and transmitters, from one nerve cell to another. This is a description that matches the observed structures, but such an understanding would make the chemical synapse a fault in the process of information transmission. Certainly, a 'gap' can't exist for the purpose of connection and transmission. Electrochemical reactions cause a delay in current transfer and also increase the fatigue of neural activities. In neurology, the chemicals in the synapses are called neurotransmitters; however, from this new perspective, a more appropriate name is neuropixels. From the perspective of the non-motion cognitive form and the process of integrated information, synapses exist for the production of neuropixels



To understand this point, we need to know how we sense the formation and updating of neuropixels out of complex neural activities. A bioelectronic field, which covers the human body, is defined to do the job. As a fine and delicate electrical field, it is very sensitive to the electrochemical reactions within it.

For this sensory field, the activities happening within nerve cells and tissues are enclosed. Only electrochemical reactions which are exposed by the gaps in the nerve tissues (synapses) can be sensed accurately and clearly. Synapses are units of a 3-dimensional biological display. Neurons and nerve tissues are bio-electronic components and circuits. In conclusion, synapses are for information integration, and our senses are a non-motion form of information, based on integrated information.

Part 3: Integrated Information and the Interactive Mechanism

A further understanding and proof of the integrated form and principle of sensory information is to realize the true function of senses. The content of integrated information is relative features. This information is not limited by the specific units as long as their integration contains relative features such as negative and positive, black and white, strong and weak, 1 and 0, etc. These relative features can be formed during uneven interactions. The relative features formed during uneven interactions and can represent the features of the interaction. Therefore, during a series of interactions, the relative features can be formed at the start of the interaction, then passed, recorded and synchronized by an interactive information mechanism.

For example, light undergoes a series of reflections during interactions with the environment, forming light with a relatively weak or strong distribution. When the light of varying intensities excites photoelectric receptors of the digital camera, the currents are aroused with varying intensities proportional to the intensity of illumination. The currents trigger electrochemical reactions and form pixels with relative features, which are proportional to the intensity of the currents. The relative features of these pixels form integrated images. Our sensory information processing is also based on this interactive information mechanism. The integration of neuropixels with relative features can represent the interactive features which are collected from the surrounding environment. Therefore, the cognition based on sensory information can direct our interactive activities with environment. At the same time, the integrative features that the neuropixels represent can also mark and decode the environment into sensory forms for the identification of environment.

There are interactions between our sensory system and the external world, but our sensory form is virtual (non-dynamic) and integrated. In another words, reality does not exist in the form we sense. I call this cognitive mode the Virtual Interactive Cognitive Mode (VICM). The VICM is a non-motion cognitive mode based on the interactive mechanism and virtual integrated information. Through the VICM we can cognize and control interactions and also create virtual cognitive forms to describe reality. From a functional point of view, senses must take interactive features as the content of information for our survival needs. It is a functionally directed cognition mode. If our senses were to understand the natural motion features of the environment directly instead of recognizing the interactive features, our senses would no longer help us and would lose the ability to accurately direct our daily interactive activities with our environment. Without any doubt, the cognitive mode we are born with is the best suited for our survival needs.

Part 4: The Integrated Principle of the Current Worldview

The scientific world view considers that everything is made of units of matter. This material point of view is actually based on an integrated-non motion form of cognition, which is supported by the principles of sensory cognition. The material motion observed through our senses is not a motion form of information; rather we sense changes in static information. The cognitive form decides the cognitive method. Sensory cognition isn't based on the motion form and can't cognize motion features and mechanisms. However, it builds up the non-motion form of perception, such as shape, structure, mass, and density-based on interactive and integrated principles and mechanisms.

The non-motion form of cognition is unable to cognize motion features and mechanisms directly. We have to use integrated information to attempt to study motion (s=d/t, for example). The way we research reality is decided by how we perceive reality. In scientific study, the interactive features we observe are considered as facts and these features can be cognized and proven during interactions. We gain cognition based on the interactive mechanism and at the same time check the validity of our perception through interactions. It is a closed circle of cognition which creates interactive "facts" but prevents any awareness of the natural motion truths.

Before we have an awareness of our own cognitive form, and can breakthrough it's inherent limitations, the scientific study of nature and the application of technology remains motion blind. We can't discover the truth of motion using only sensory observation, integrated methods, and interactive experiments. In scientific study, the cognitive principle and methods have provided the path of development, but are also the barriers that limit understanding. My research is not limited by scientific views, observations or interactive experiments. Instead it focuses on cognitive re-development which is led by the expansion of cognitive form. The next stage of cognitive development for humans will be breaking through the limitations caused by the current cognitive way to develop a new cognitive mode, which can cognize motion form of features and mechanisms directly.

Conclusions:

Our basic sensory form is integrated by interactive features formed through interactions between our senses and the environment. This cognitive mode successfully meets our needs of interacting with the environment. We do not sense the true motion form and features of reality. This limits and misguides the development of scientific study and practice. An evolution of cognition is necessary to break through these limitations and accurately cognize the motion truths of natural reality.