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Does Wu Kun's Philosophy of Information define what is Information?

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I am not a philosopher. I am an engineer busy with Image understanding problems.

Image understanding is a facility required in many modern life-supporting systems:
Homeland security, Visual surveillance, Medical imaging, Earth satellite imaging.
Today, only human beings are endowed with such an ability.
Yet, how they do that – nobody knows.

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Once upon a time, I had had also some ideas about the subject,
but people did not like them: My conference submissions have been repeatedly rejected.
The European Conference on Computer Vision (ECCV 2006) was extremely harsh:
"This is a philosophical paper... However, ECCV neither has the tradition
nor the forum to present such papers. Sorry..."

Ten years passed since then. Nothing has changed in the world.
Only a slight divergence from the original practice can be observed:
As a guest of a Conference on Philosophy of Information,
I am trying again (together with the audience) **to get a grip why**:

350 million surveillance cameras are installed today over the world,
But no one system exists, which is capable to decipher their content.

Medical screening would take a few minutes of your time,
But then you would have to wait many days until a human interpreter
Will explain to you what is depicted in the acquired image.

Terabytes of data are delivered by Earth imaging satellites,
But only a very small percent of it can be actually used –
Without human-made annotations this data is of no use
And is being buried forever in the Earth satellite archives.
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Wikipedia defines image understanding as
"**the disentangling of symbolic information from image data**".

In this definition the key word is not "**disentangling**".
The key word here is "**information**".

Does anybody knows "**what is information?"**
No, no one knows what is information!

The plurality of existing definitions is a real headache
For contemporary engineers, scientists and philosophers.

I do not intend to bother you with enumeration of existing definitions.
I would like to draw your attention to my attempts
to resolve this embarrassing situation.

My definition of information in its latest edition sounds like this:

“Information is a linguistic description of structures observable in a given data set”.

Two types of structures can be easily discerned in a data set:
Primary structures, which are groups of data elements fused by similarity,
And Secondary structures, which are primary structures gatherings.

Primary structures formation is guided by similarity in data physical properties.
Therefore, description of primary data structures I propose to call
Physical Information.

Secondary structures formation is guided by the observer's customs and habits.
Secondary structures have special meaning to a given observer.
Therefore, description of secondary data structures I propose to call
Semantic Information.

To summarize: **Information is a complex two-part notion**
Composed of Physical and Semantic information constituents.

Why am I so obsessed with an information definition?
Because coherent everyday information use and handling
is impossible without a trustworthy and reliable definition
of what information is.

There is no place for mind games or enigmatic puzzles.
This is at the heart of our world exploration activity:
We make some initial hypothetical assumptions,
We apply “IF - THEN” considerations to the observed world
Or launch some trials to validate our hypothetical forecasts.
If our predictions are right – we use them to expand further
Our introductory definition.

Considering the just proposed information definition,
Several further assertions must be highlighted:

The duality of information is the most striking novelty.
It has been already known before under different nicknames:
Objective-subjective duality,
statistical versus meaningful dichotomy,
countable and quantitative as opposed to qualitative division.

But for the first time it is not a couple of incompatible concepts.
On the contrary, it is a “conjugate pair”, a “coupled disjunction”
like a complex number in mathematics.

What has to be mentioned in this regard: Despite the tight bounds,
Semantic meaning is a separate entity. That is,
semantic information cannot be derived from the given data.
In other words: **data is meaningless** (a very often violated principle).

Semantic information is a subjective observer's property,
Thus, **its creation cannot be formalized or rigidly prescribed**.
Therefore, **Semantic information cannot be freely learned**,
It **can only be granted, donated, supplied from the outside**.

(A very important viewpoint totally overlooked in the modern
Machine Learning and Machine Intelligence faculties)

Both information constituents are linguistic descriptions.
Physical information is usually described in a mathematical language.
Semantic information can be described only in a natural (human) language.

What follows from this is: **Information is a material substance**.
A string of words written in an appropriate alphabet,
A story, a narrative created and processed in a system.

What follows from this is: **Information processing is text processing!**
Not data processing, which is a computer's concern,
But an unknown yet text processing practice.

Lotfi Zadeh has proposed to call it **Computing with Words**.
But in the passed 40 years it has not took off.

The list of “insights” in neurobiology and brain research,
Which originate from the proposed definition of information,
Is awaiting for validation and further research incorporation.
That is a pure engineering task. Almost no place for philosophy.

In spite of that, I would like to rise a philosophical aspect of this definition.
There is a palpable and obvious shift in our current scientific paradigm
from a computational data-processing-based approach
To a cognitive information-processing-based mindset.

The evidences are abundant and ubiquitous:
Computer Vision is now becoming Cognitive Vision,
Computational Biology becomes Cognitive Biology,
Computational Neuroscience becomes Cognitive Neuroscience,
Computational Linguistics becomes Cognitive Linguistics,
And so on…

What stays behind this general widespread transition
Is the growing understanding
of the nature of information duality.

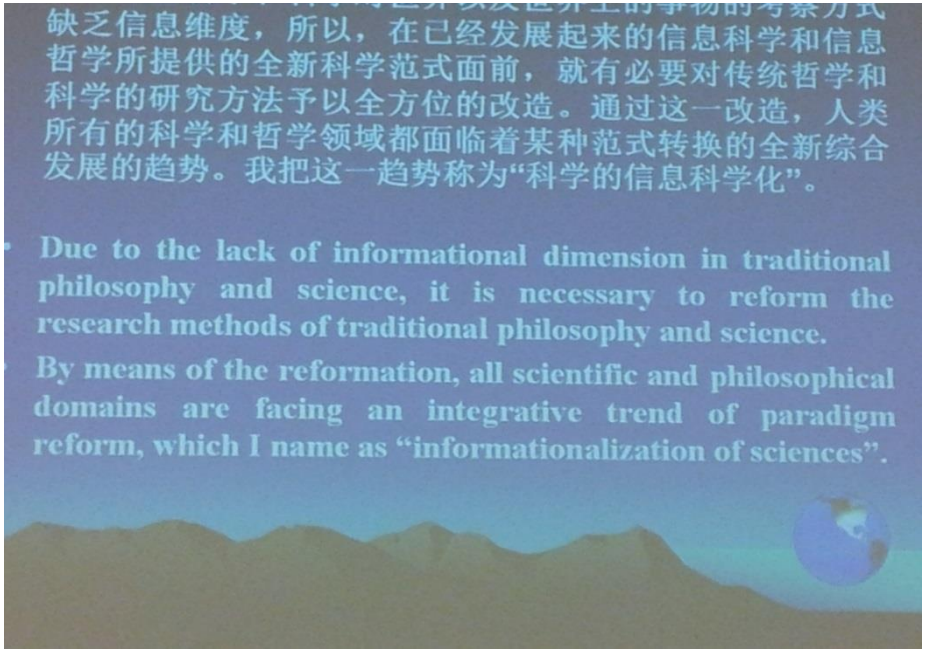
In the mid of the past century, the brain was seen as a computer
(The most powerful and influential metaphor of that time).
Computer was a data processing machine and thus
data-based information processing machine,
(That is, physical information processing device)
Was the only and the most popular paradigm of that time.

Only physical (data-processing-based) information examples
Have been considered and have been crowning on the stage:
Shannon's information, Kolmogorov's complexity,
Chaitin's algorithmic information, Fisher's, Renyi's,
and other.

Although the notion of Semantic information is still unknown to the public,
The urgent need for a new scientific paradigm is undeniable.
It is present and it is influencing our today's scientific life.

At the previous 2015 IS4SI Summit in Vienna
Wu Kun in his invited talk has posited:
"all scientific and philosophical domains are facing an integrative trend of paradigm reform, which I name as "informationalization of sciences".

That is a fragment of Wu Kun's invited talk at Vienna 2015 Symposium



"all scientific and philosophical domains are facing an integrative trend of paradigm reform, which I name as "informationalization of sciences".

I am not a philosopher. I am an engineer.
Frankly, I do not understand
how Wu Kun came to his conclusion
Without a clear definition of What information is.

But despite of all, our final conclusions overlap: We both agree that the world is ready to accept information as a new paradigm, That the world is becoming more and **more informationalized**.

And the ubiquity of this transition is undeniable.

Thank you for your patience