Navigating the ICT alphabet soup (and semantics)

Signal , Measurement, Information , Data , Coding , Communication , Computation , Perception

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(Presentation will be made available on github , under creative commons license)

40 min explanation on Youtube: https://www.youtube.com/watch?v=2IM7rp2irFg

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SIGNAL:

A signal is a measurable and controllable change in a changeable aspect of some perceivable entity . Through changing attributes of such an entity , **information** is **encoded**

Perceivable:

Some aspect of an entity needs to be perceivable , if it is beyond perception , then its existence or lack thereof is of no use for anyone transmitting or receiving information.

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SIGNAL:

A signal is a measurable and controllable change in a changeable aspect of some perceivable entity . Through changing attributes of such an entity , **information** is **encoded**

Changeable:

The aspect needs to be changeable . Else it cannot carry information.

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SIGNAL:

A signal is a measurable and controllable change in a changeable aspect of some perceivable entity . Through changing attributes of such an entity , **information** is **encoded**

Controllable :

The aspect needs to be controllable. Controllable means that the aspect needs not just to be changeable , but changeable at will and to the degree desired .

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SIGNAL:

A signal is a measurable and controllable change in a changeable aspect of some perceivable entity . Through changing attributes of such an entity , **information** is **encoded**

Measurable:

The aspect needs to be measurable. Over here we mean somewhat inverse of controllable. The ‘controlled’ change of the entity’s aspect , should also be measurable . If a measurement method does not exist to measure the controlled change , then information cannot be received.

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SIGNAL:

A signal is a measurable and controllable change in a changeable aspect of some perceivable entity . Through changing attributes of such an entity , **information** is **encoded**

The Change itself:

Finally the change itself . This is related to the definition of information and encoding.

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DATA:

Heavily overloaded term , let's keep it simple. I'd rather not use this term.

Data is nothing but a set of changeable, measurable, controllable state of aspects of some entity. It may or may not be retained .

In other words , it is just some phenomenon. Could be electromagnetism in a hard drive , mechanical arrangement in an abacus , electro-biochemical state in a human cell , etc

It is only a perceiving , controlling , measuring **mind** that gives any meaning or purpose to data. More **useful** terms: information , computation , representation

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KNOWLEDGE:

Set of everything that a perceiving mind “knows” at any instant of time.

More exploration than this , is another alphabet soup , better suited for another day , another video.

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SYMBOLS AND REPRESENTATION:

Symbol is something that represents something else.

Representation often, if not always , is done through encoding.

Examples:

9 is the representation of a number (which is just a concept) , encoded in decimal number system

1001 is the representation of same number (just a concept) encoded in binary number system

Congressman/woman or MNA is a representation of the people who elected him/her encoded through some political process.

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INFORMATION:

Information is “knowledge” in transit.

The “knowledge” of a perceiving mind is encoded into symbolic representation and the transit occurs through a signal. At the other end , some other perceiving mind gets the signal, decodes the encoded symbolic representation of knowledge , and perceives it. That information , adds to the “knowledge” of that perceiving mind.

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COMPUTATION:

Any state transition under the control of a perceiving mind can be characterized as computation.

The following concepts as discussed earlier are relevant here too:

Measurable

Changeable

Controllable (afterall, state has to do transition)

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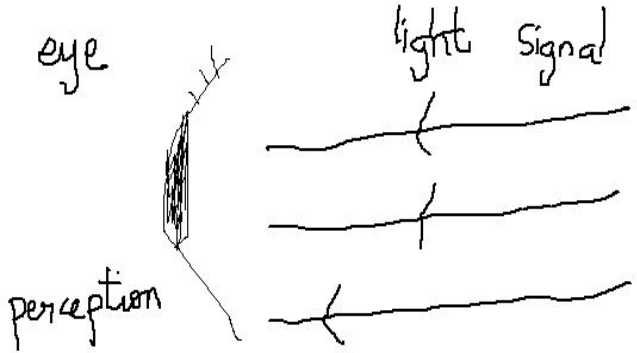
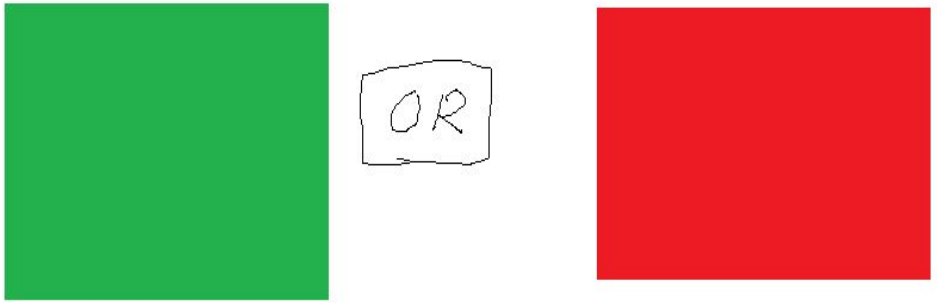
EXAMPLE SCENARIO 1: Signal carrying information





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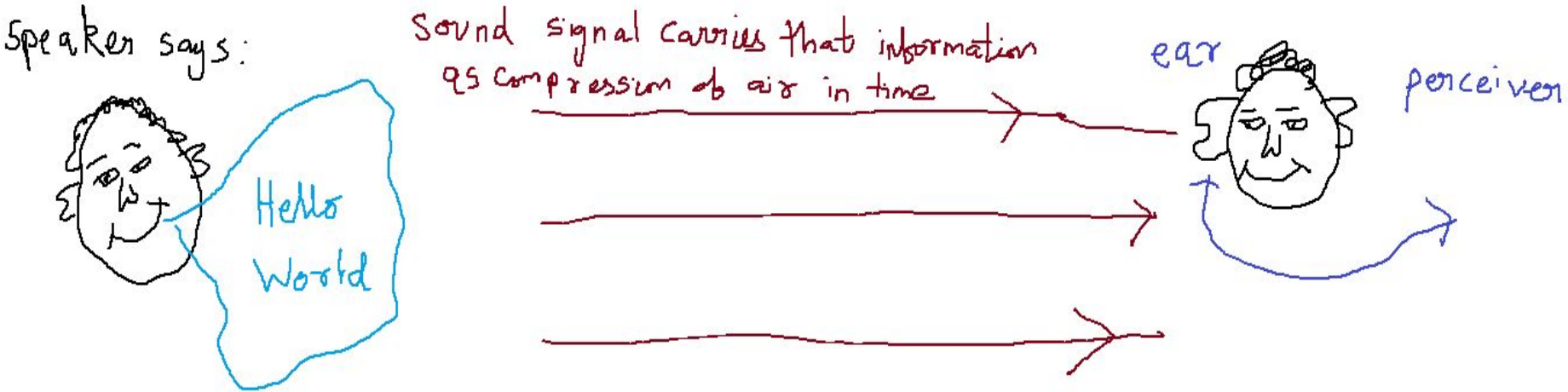
EXAMPLE SCENARIO 2: Signal carrying information



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EXAMPLE SCENARIO 3: Data means nothing

Abacus showing decimal representation of number of millions of years till universe will die.

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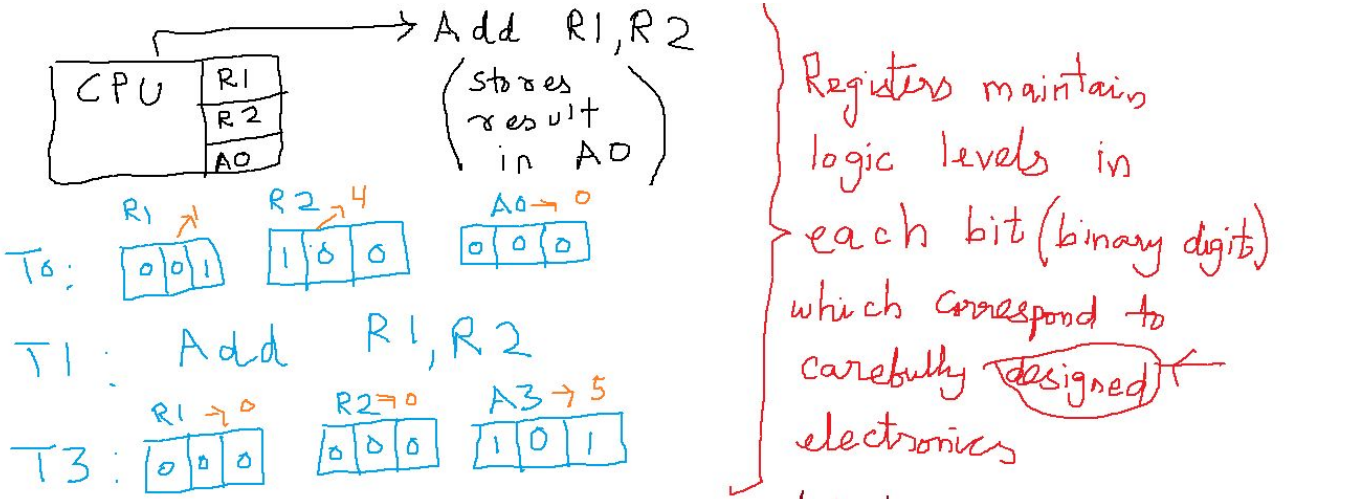
EXAMPLE SCENARIO 4: Computation



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HOMEWORK :)

Think about following two questions:

1) Is it possible to compute without generating information?

2) Is it possible to generate,transmit or receive information without performing a computation?

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Thank you , hope this was somewhat useful to you .

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