

Erkenntnis

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Running title: Knowledge Formulation

Title: Molecular Formulation of Complete Human Knowledge

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### Abstract

Today with infinity-breaking pace of advancing human knowledge, human civilization has progressed to the point that a universal unification theory is needed as a base in order to built philosophical tools for every citizen in the world, where the intuitive reasoning power of individual free-will has been getting limited for good. Therefore, I am guided to propose a molecular formulation of complete human knowledge. Such guidance is based on a discovery that all human thinking and reasoning can be infallibly reduced to an infinite serial chains consisting of fundamental building unit of understanding, named "Codon". A codon, an analogical term coined from genomics of life science, is a combination of three key common elements, namely "Law, Concept, and Phenomenon", "LCP" in short, which can be found in every branch of philosophies in all human history from ancient to modern time. Extending such analogy from its root is believed eventually to be able to reach a revolutionary level, a phenomenon called "Direct Understanding Exchange", upon which Natural language will no longer be the only "meaning-carrying vehicle" for human communication. The

more information technology moves forward in future, the more powerful this learning system will be.

Keyword: Knowledge; Understanding; Direct Understanding exchange; Philosophical tools; thinking; Reasoning; Codon; Molecular; biology; Formulation

Session 1 Knowledge Formulation:

$$\sum_{T < 0}^{R_-} \{(-LCP)_n\} @ T_0$$

Read: Right now, this is what has already been all known about all things.

(“ $\sum\{(-LCP)_n\}$ ” in short, or designated “DUE Conceptual Molecule”. “DUE” stands for Direct Understanding Exchange)

Session 1.1 Explanation on Symbols

@ T<sub>0</sub>: “At Time zero”, also means “Right now”, or “Right at this moment”, and so on. The concept of Time, T, has its full range of meaning crossing all subjects of knowledge. In most cases, it can be put into two categories: time with or without a calendar reference point. For instance, “Year 2004”, a calendar time, is one using Jesus Christ’s birth year as a reference point. As a calendar free reference point, T<sub>0</sub> can be any ending point of any event regardless its position on a generally recognized time frame. For instance, we can say, “When a PCR (Polymerase Chain Reaction) is done, a million fold increase of a same DNA molecule copy can be easily obtained.” Here, “@ T<sub>0</sub>” is the time point of “When a PCR (Polymerase Chain Reaction) is done”.

∑: “Sum”, “Sum up”, “All added up together”. It shares same meaning with its counterpart in mathematics.

R<sub>-</sub>: The set of negative real number, a concept taken from mathematics.

$T < 0$ : “before now”, “before this moment”, any time point before  $T_0$ . It has no limit in how far it can be stretching into the past. For instance, in a macroscopic scale, it can be about 4 billion years ago when DNA, the molecules of life, started forming on Earth; in an extremely microscopic scale (quantum), it can describe decoherence time.

$\{(-LCP-)_n\}$ : a set with a unit called “Codon” (resembling the genetics’ in biology), which contains three fundamental and inseparable subsets in a symbol  $(-LCP-)$ , L is the subset of all “Laws”; C is the subset of all “Concepts”; P is the subset of all “Phenomena”. The technical nature of  $(-LCP-)_n$  resembles the concept expressed for “Polymers” or “Polymerization” in chemistry for organic and large size molecules, in which “-“ is the bonding symbol at high position on the left side to make “-L”, and low position “P-” on the right side in a codon; and the subscripted “ $n$ ” is indefinite whole number meaning the number of repeated units in a “polymer” or a codon.

Thus, the sense of totality on mastering of understanding all things by forming such “Conceptual Molecules” must be traced back from their roots, which grow up in the rich soil of concepts of infinity and countability from set theory of mathematics, and deeper meaning of concept of DNA molecules that are parsimonious and endlessness representing at same time. Non-intuitive nature, illusionary and mysterious impression about the concept of numbers in the field of mathematics force most people shying away from intention for mastering the laws of it, which are, also non-intuitively, the final standing ground for all reasoning and thoughts including categories of non-science and religion.

Session 1.2 Further explanation on “LCP”:

L: A subset called “Law, is something, which is believed by a person or a group of people consistently or inconsistently, having a governing power over appearance of

phenomenon. It includes or is defined as, such in science, every law, principle, axiom, rule, theory, hypothesis; or in non-science every law (in legal system), policy, rule, tradition, pure personal opinion, trick, even lies (not telling the truth); or in any religion, every law, decree, dogma, and anything as a believe.

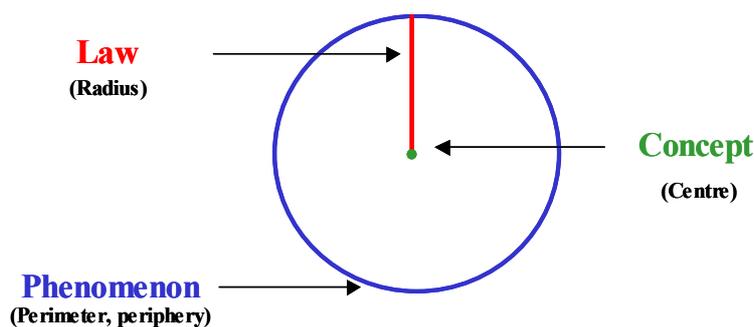
C: A subset called “Concept, often means a full definition of a word or term with its true meaning; or an expression in any fashion, which has the most basic understanding of something.

P: A subset called “Phenomenon”, anything that can be recorded in the format such as text, music notes, graph, drawing, photograph, sound recording, image recording (movie, video, etc.). After all, it is an object of perception: something perceived or experienced, especially an object as it is apprehended by the human senses as opposed to an object as it intrinsically is in itself.

### Session 1.3 Geometrical expression of DUE Conceptual Molecules

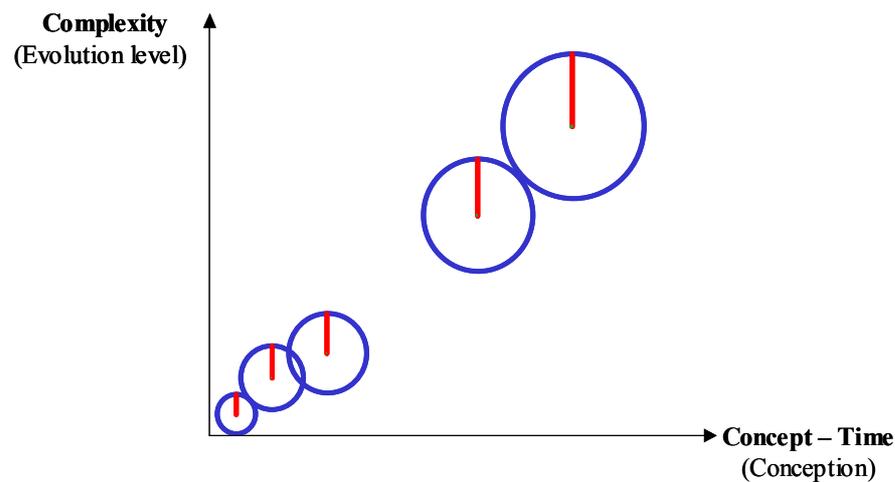
To fully understand the concept about those “concepts”, their geometrical presentation are given in the following two graphs.

Graph-1: Expression in a circle



(Read: Phenomena are explained, once the Concept and Law are determined.)

Graph-2: Expression in the Cartesian plane



Notes to Graph-2: Different circles have different positions (centre) and sizes (radius). It means that different DUE conceptual molecules have different concept and different law. They may or may not have different sets of phenomena.

Session 2. How DUE Learning System works

Session 2.1 General Scheme:

Natural Language (with or without audio or image presentation)

$\leftrightarrow \sum\{(-LCP-)_n\}$

Session 2.1.1 Time-point “T” tagged all subsets of LCP:

T should be proposed first discover time for LC, recording point for P when building the DUE codes using calendar time as reference. From a book or any written publication, it will most likely be the time when a theory, theorem, rule or doctrine, in one words a Law, and its Concepts (which are always in its Law), is recorded at first time in history. When a Law at a new T point shows more powerful, in other word, in some cases namely, is able to explain sets of Phenomenon that have not been expandable before, such Law is standing at higher position to the derived old one. Structurally speaking, it should be written on the left end of chains of reasoning

molecules of (-LCP-). Thus, with time tagged molecules, the trace of evolution of every thought gives all reasoning their own history of life. Such history is not only reflected in the progress of human civilization as a whole, but also shown in the life of each individual, although most likely in an incontinuous manner.

#### Session 2.1.2 Building three Libraries:

Three subset-libraries in digital format need to be built in order to have a fully functional DUE system. They are “Library of Law or Concept or Phenomenon”. Once completed, they are more or less resemble the data from GenBank or any DNA sequence data bases, where the codes being presented in their appropriate open reading frames for phenotypes of all kind of lives, are organized and stored. In DUE system, Nature Language is “phenotypes of the DUE codes. For better understanding, let me give a simple demonstration. It is about HIV infection:

These are 12 codons with correspondingly translated 8 amino acid sequence (an actual part of HIV-1, human immunodeficiency virus type-1, envelope genome):

TGG AGG GGC TAA TTC ACT CCC AAC GAA GAC AAG ATA  
M R V K E K Y Q H L W R

Here’s 3 codons of DUE molecules coding for something about HIV infection:

Trimmed format: -LCP- LCP- LCP-

Sub-organized: -(1) LCP- (2) LCP- (3) LCP-

Real DUE codes: (1) L: Laws of Thermodynamics;

(1) C: Temperature, heat, entropy, etc.

(1) P: 37 degree, body temperature etc.(just text)

(2) L: Theory on Molecule Interaction

(2) C: Molecules, Proteins, interaction etc

(2) P: Molecules, Proteins, interaction etc (just text)

(3) L: CD4 as receptor, plus co-receptors needed for HIV infection

(3) C: Envelope, Receptor, co-receptor, : binding, fusion etc.

(3) P: Envelope, Receptor, co-receptor, binding, fusion etc. (just text)

Here's an interesting note about the subset of Phenomenon: the "P" in "(3)LCP" can be presented as the way just seen above:

TGG AGG GGC TAA TTC ACT CCC AAC GAA GAC AAG ATA  
M R V K E K Y Q H L W R

In natural language in English, it can be written as such: "By following the principles stated in the theory of thermodynamics, HIV infection has been explained as an energy release from higher state in unbound gp120/gp41 of HIV envelope proteins through binding its receptor CD4 and co-receptors CCR5 or X4, to the lower state of bound state of the complex, eventually fused into the target cell and make it infected"

It must be said that if the writing about HIV infection is in Chinese, in DUE codes, the subsets of Law and Concept under the category of science should be EXACTLY same, although the subset of Phenomenon (e.g. Text) and subsets of Law and Concept under the category of linguistics (e.g. Grammars) are different. As we all know, it is a translation, but done completely and accurately by computer. It may look like as such:

“基于热力学原理, 艾滋病感染可被解释成如下过程...”

To completely describe the theory on HIV infection and proof on its relationship with AIDS development, it needs a good book-length work in the real life of writing. However, no matter what and how this kind of book is written, the generalized scientific principles and laws used in explaining all things or the phenomena about HIV/AIDS can be de-coded into such a serials of final indigestible units of “understanding building materials”, so to speak. As a writer, before a book is finished, such “thinking blocks” must clearly exist in his or her mind. One of many obvious evidence for that in scientific community is that authors of any scientific paper must list so called “References” as the bases of their reasoning roots. Some entities, which are technically close to DUE system, are Linguistics and Semantics. However, they can only be considered part of DUE system, where the practical rules of them are categorized under “Law” subsets and part of contents of ‘library of Law’ along with other specialty from the fields of science. So does the subset library for Concept “C”.

Now, let us take a few more words on the subset library of Phenomenon, since a reality of such design is actually shaping up not just in United States, but also in Europe, soon eventually everywhere on Earth, digitizing the contents from all kinds of books. In other word, some visionaries, who share the same vision and passion on improving efficiency of learning and enhancing human understanding, are building the subset library of Phenomenon.

Session 2.1.3 Thinking and Reasoning equal finding and filing the positions on the chains of DUE molecules

When two idea or opinions are being compared, deciding power should mostly weigh on subsets of L and C, but less on P. This means that appearance is less

significant than the core of true meaning. This explains that every translation works from foreign language can never be perfect, but can always be feasibly accurate and sufficient in terms of expressing meanings from a pool of subsets of Law and Concept shared by all mankind regardless different ethnic and culture background.

Geometrically speaking, a "P" point on the peripheral of a circle can never be another same point but fixed "C" central point and "L" radius determine the overall nature of a conception. In analogy by DNA hybridization, it resembles a situation when weaker binding base A or T, instead of C or G, is messed-up, or a flexible base swapped in the last position in a codon, the overall effect to hybridization is relatively less significant.

As a result, in a real "understanding exchange" process, there can be a perfect "understanding" without "perfect matching" for a thought or reasoning or an answer.

#### Session 2.1.4 Proposals

Many proposals can be suggested based on the general formula  $\sum \{(-LCP-)_n\}$ . Here are a few common schemes, which must exist in every circumstance, being presented as follows:

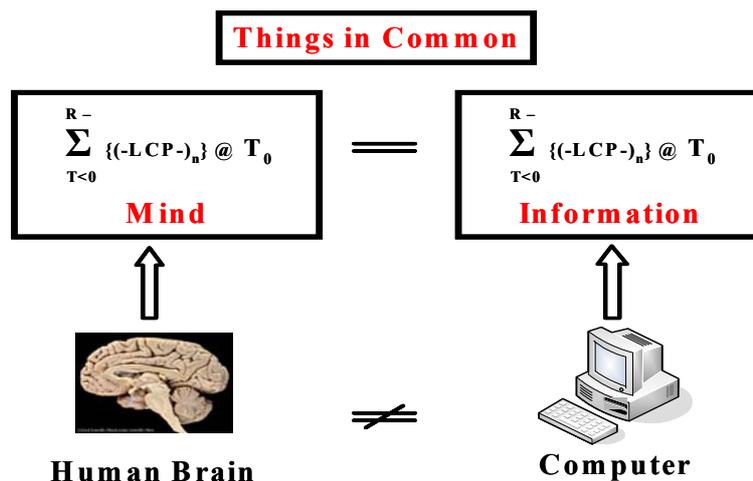
- (1) Personal Library: It contains all personal collected Phenomenon in a digitized format, namely the books that have been read, music that have been listened, pictures that have been viewed, movies that have been seen, so on and so forth. These Phenomena are encoded to show -LCP- attributes based on its own intrinsic reasons.
- (2) Local (-LCP-) processing facilities: A panel of computer software is needed to process incoming and outgoing data, which are written in -LCP- codes, and convert information in the form of nature language into -LCP- format.

(3) Synchronization along with Public library: A commonly shared on-line public library for subsets of Law and Concept should be constantly up-dated in day-to-day basis so that understanding of things in a newly discovered way can be achieved and shared with others almost instantly without wasting too much time of others. When news is really news worthwhile for attention to be paid by others, it will wake the appropriate reader or audience at right time and right place. Meantime, the best solution will be proposed based on all the knowledge in mind, namely  $\sum_{T<0}^{R-} \{(-LCP-)_n\}$ , @  $T_0$ .

Session 3 Application and Significance:

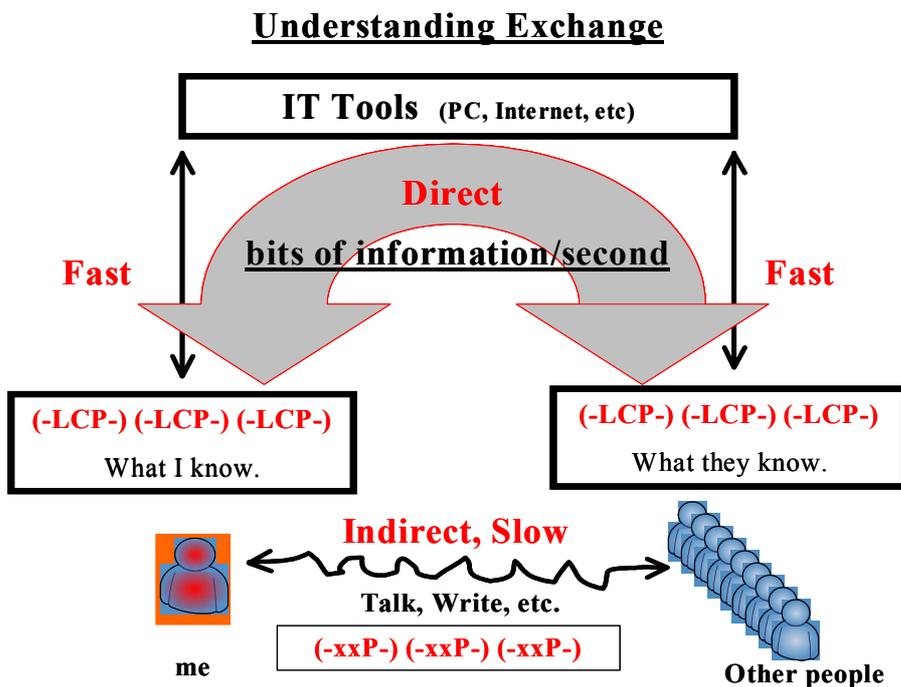
Once DUE system is matured, there will be no limit as a thinking and reasoning tool for all mankind. I would like to serve the purpose of writing the following paragraph by showing two illustrations.

Illustration-1



Two different entities, human brain and computer, can share exactly same conceptual elements, DUE molecules, without obvious physical similarity between them. It would not be too surprising that Alan Turing would be for such notion “Somebody got something which I really meant”.

Illustration-2



Unprecedented human innovations are and will be helping more on improving human communication and learning experience.

#### Session 5 Summary

A new learning system is proposed based on a discovery that human reasoning or thinking in general can be built on a well-ordered basic structure called DUE conceptual molecule. It is believed that once full devolvement of such system is complete, a new way of communication among human being, called direct understanding exchange, will be realized.

By the way, I like to end my writing by drawing a dream that Dr. Roland Omnès, a professor at University of Paris XI, France, had for quite a while. Here's his words he states in his book titled "Quantum Philosophy":

One of my most precious dream partly responsible for this book—is to see one day scientific knowledge so clearly established as to allow a return of philosophy to its pre-Socratic sources, finding in science its own foundations or its most fitting mold.

I think, professor, that mold is here:

$$\sum_{T < 0}^R \{(-LCP-)_{n}\} @ T_0$$