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The Algorithmic Philosophy — A Synthetic and Social Philosophy

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Funding: No specific funding was received for this work.

Potential competing interests: No potential competing interests to declare.

Abstract

This paper, as the introduction part of the forthcoming namesake book, introduces how the Algorithmic Thinking Theory, a theory of human minds, can be used to solve many philosophical puzzles and therefore form a “grand synthesis” or unification of existing various philosophies. Innate discrete thinking tools process information or data from the external world serially, selectively, repetitively, roundaboutly, and economically, leading to consequences such as “Mental Distortion,” knowledge solidification, and combinatorial explosion, thereby forming a dynamic, pluralistic, embrative, and expansive knowledge system where “being” and “opinions,” ontology and epistemology, rationality and irrationality are all synthesized. Thoughtful entities exist, move, change, combine, interact, and grow to make social phenomena the “independent third party” between human and the world, which implies both the differences and compatibility between natural and social sciences. Democracy, freedom, market, institutions, and organizational power are explained unprecedently logically. All major philosophical branches, schools, and scholars are included in this concise panorama that stems just from this formula: thinking = computation = (instruction + information) × speed × time. This highly original approach was inspired by computer science and customized just for the making of principles of humanities and social sciences.

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Keywords: philosophy; mind; Algorithm; unification; social philosophy; infinite development.

Introduction

The purpose of this book² is to introduce a theory of mind, or a “thinking theory”. The theory and its corollaries form a series of principles that did not exist in the world before. When it was introduced into philosophy, many of the major puzzles that had been confusing philosophers for long periods were answered one after another, and the existing

branches and schools of philosophy were all merged into a single whole. This is called the “Grand Synthesis”, and the logic presented in it can also be used to construct a unified knowledge system of humankind and lay the real foundation for a unified social science.

In this era when pluralism is prevalent, theories of grand unification have been seeming doubtful and unsellable. Nonetheless, with those fresh but self-evident logics, this series of principles is used to indicate how the unification can be established in an acceptable way, while encompassing plurality, conflict, subjectivity, relativity, uncertainty, development—and crucially, any logical inconsistencies here may only be existent temporarily. I discovered this theory at the beginning of this century in order to solve the fundamental problems in economic theory, and at the same time found that it could be used to lay the foundation for a unified social science and humanity. However, its philosophical application has progressed more slowly. It is only in recent years that I discovered that when it is used to synthesize the various philosophies, it is just as surprisingly satisfying.

The Algorithmic Thinking Theory

It's not surprising to say so, as it's a theory of mind. From ancient times to the present, we humans have not had a satisfactory theory of thinking. The history of philosophy throughout history can be read as a search for some appropriate thinking theory. The existing doctrines of thinking are fragmentary, or in the style of natural science. One of the criteria for an “appropriate thinking theory” could be “softwareization”; that is, *the mind should be able to explain itself with its own language, and without using natural science terms such as molecules, atoms, neurons, etc.* I was surprised to find that the answer to this seemingly difficult task was almost ready-made, which had been in obscurity for decades in the textbooks of computers. Since there have been so many gifts that computers have offered to humankind, how can they once again contribute such a precious one to philosophy, humanities, and social sciences!

This is the principle of “thinking = instruction + information”⁸. An “instruction” is a kind of basic operation in a computer, among dozens of core instructions in it. It is what the user of the computer “tells” the computer to perform as a minimal task, so it reflects a type of basic thinking activity that can be carried out in the mind of the user, the human being. These types are the same for all computers and for all computer users. In this way, is it not a basic thinking tool of the human brain as Kant suggests? Or does it not reflect the concrete situation of the innate thinking capacity of the human brain? Aren't different people able to communicate with each other because they share the same basic abilities of thinking? Clearly, the concept of instruction has been severely neglected. Instruction can be paired with external information to form a relatively complete set of concepts that can be used to provide the necessary and bottom structure for the theory of mind. An instruction operates on a quantity of no more than two pieces of information, which is like a machine processing certain raw materials. It constitutes the minimal unit of mental activity (“Meta-computation,” or “an operation”). The human brain can only perform such a unit of operation at a time, so computational operations must be strung together to form a stream of behaviors. This naturally introduces a temporal dimension to the activity of minds. The data resulting from computations must be stored “*alongside*” for intermittent use later. This naturally introduces a spatial dimension to the activity of minds. This is what economists call the “roundabout method of production”⁴. It works in cycles, both requiring

and generating stocks of knowledge. In this way, the concept of “knowledge” is formed, which is different from instructions and information. Knowledge exists as a relatively independent “third party” in the human brain, or in books, databases, etc.

This is the “Algorithmic Thinking Theory” (or the “Algorithmic Theory,” “Algorithm Framework Theory,” “Algorithmic Framework,” hereinafter referred to as “ATT”) that I propose. It can be shorthand to a formula: thinking = computation = (instruction + information) × speed × time. In natural language, when humans think, it means that they use the instructions (the capitalized first letter indicates that they are human’s rather than computer’s) inherent in their brains, universal to everyone, to process information from the outside world serially, selectively, and repetitively. Information can be reprocessed after processing, so it is called “repetitively.” Instructions can be equated with verbs in natural language that refer to mental actions, so this theory can be used relatively independently of computers in philosophy, humanities, and social sciences. Moreover, we can expand the scope of instructions to any verb that refers to a mental action (the “artificial instruction”), even if it cannot be simulated by a computer for the time being, since the mental action referred to by this verb can indeed be performed by the human brain; this is enough for us to treat it as an “instruction”—as long as we assume that the mental action referred to by it is carried out also in the form of “instruction + information,” or “verb + object,” relatively independently. Therefore, ATT is a theory of human thinking, although it borrows the form of computer principles; in the final analysis, it has nothing to do with computers. Among them, “algorithm” is a method or sequence of information processing that uses instructions. Apparently, it is the hardcore of intelligence, thus I use it to title this theory of thinking and use words such as “algorithmic” and “algorithmical” to refer to multiple meanings such as “of algorithm,” “of ATT,” or “under ATT,” and so forth.

The Algorithmic Principles

This theory is bound to be questioned by opponents of artificial intelligence (AI) or computationalism. Significant advances in AI show that computers are increasingly capable of performing tasks that are distinctly subjective, just like human brains. Presumably, these developments have sent shockwaves through opponents. I argue that, just as the concept of instruction has been neglected, computers can actually behave more like humans than they once appeared, but programmers usually prevent them from doing so. The similarity between a computer and a human brain lies not only in the fact that the computer can perform meaningful high-level operations that the human brain can do, but also in the fact that the computer experiences such “confusions” and failures as the human being. Hence, the “confusions” and failures experienced by computer and AI engineering are instead evidence that the human brain runs in much the same way as a computer. And the assumption of the above-mentioned Artificial Instruction can already make ATT largely free from the controversy about AI.

However, the effectiveness of ATT is especially manifested in the “subjective turn” of computations derived from it, or the “Mental Distortion” and “Mental Solidification”, so as to establish a direct and deductive logical relationship between those traditional chilly and mechanical computations and the so-called “*spiritual activities*” of human beings. Meta-computation *works* or *produces* in a sea of data, which means that information, data, and knowledge are all the *entities*, “*substances*”,

or “*existences*”, and computation is a kind of “*behavior*” that is similar, juxtaposed, and *interactive* with human body movements. Computer principles help us to clarify how these entities “exist”, how they relate to the material atoms and molecules, how they arise, move, change, disappear, and how they bind, separate, or interact with other entities, and so on. Therefore, the actors need to consider the costs and benefits of computations; namely, they need to apply economic analysis to the thinking activities.⁵ Although the deductive method can produce reliable computational results, its conditions are strict, the processes are often lengthy, and therefore not often economical, so that other less reliable but relatively simple and rapid methods such as induction, analogy, experimentation, lottery, association, and imagination can come in handy and compete with it.⁶ Decision-making in the spatio-temporal environment is often time-limited, which further turns the computational processes into a mixture of the above-mentioned methods, and the resulting knowledge is inevitably some “makeshifts” (e.g., attitudes, beliefs, values, etc.) with varying degrees of effectiveness. This is the “Mental Distortion” or the subjective turn of computations. The “purpose” itself is also somehow the result of mental distortions under the serial processing method. As a result, the stocks of knowledge become something arbitrary and rigid (i.e., the “solidification” of knowledge), but they can simply and quickly provide parameters for ad-hoc computations, or “current computations”. The concept of “knowledge” is now expanded to include all computational results, regardless of their quality. The stocks of knowledge are solidified and rigid because the computing power of any ad hoc or current computations is extremely limited in comparison with the huge stocks left over from history, and even if the stocks need to be reformed, it can only be done gradually. Consequently, most of the current computations can only be passively carried out by referencing existing knowledge stocks, even if they are more or less obsolete and imperfect.

The considerations of prudence and completeness force a thinker to summarize the entire world with limited computing power, and then *close the computations and draw conclusions*. Thus, it forms a specific version of knowledge about the world. Different individuals can concurrently hold their different versions of knowledge. The improvement of imperfect existing knowledge, or the use of new information to form new knowledge, can lead to innovations. Continuous innovations result in newer versions of knowledge that can replace earlier versions. This theory of bounded rationality can be used to prove that plurality, heterogeneity, mixedness, and “*softness*” of knowledge systems are normal phenomena. As a result, high-quality knowledge can coexist with low-quality knowledge. People develop high-quality knowledge, use it repeatedly for a long time, and develop new knowledge and revamp old knowledge. Then, there comes the mixture of convergences and divergences, equilibria and equilibria. On the other hand, an almost infinite number of combinations can be formed between instructions and massive amounts of information, which is called the “Combinatorial Explosion,” indicating the infinite potential for knowledge development. Therefore, the history of knowledge development is a process of intertwining the improvement of the quality of knowledge and *the expansion of its quantity*, which points to an infinite future.

The Philosophical Implications

After an introduction to ATT and its inferences (collectively referred to as “Algorithmic Principles”), the following is its philosophical applications. Since some of its philosophical implications are obvious, below are just a few additional points.

Computer science provides a metaphor for how thoughts can exist in a way that resembles tangibles or energetic, and thus can be identified as a type of entity on the basis that it is both distinct from and related to other objects, substances, or entities. This philosophical idea and a concrete theory of thinking both support and need each other. Thoughts, as the product of interactions between instructions and information, are the “independent third party” between them. Now, the growth of knowledge is just the growth of the entities of “knowledge” in the world, and our identification of the types of entities thus becomes complete, and there are no “non-real” “entity” or “movement” anymore outside the entities recognized by us. Both mental and physical activities are activities of these recognized entities, and the *question of truth becomes the question of the relationships between these different entities*. This leads us to further realize that philosophers have previously adopted a very special attitude towards thoughts; that is, thoughts cannot be placed as objects on an equal footing with physical objects. Thoughts are seen as something that come and go without traces, and are extremely easy to produce and change, which has given rise to the long-standing debates about the question of whether certain objects are “existent or not.”

In principle, this “independent third party” emerges as *anew thing* in the world, which is different from both the things that existed earlier and from the basic structures, resources, and capacities of the mind. The latter is innate, and the third party is acquired. This shall be the basic style of a correct transcendentalism or innateism, and the basic style of a correct unity of rationalism and empiricism. However, it is not enough to sustain even the shortest life when a person comes into the world only with a hollow mind, just like a normal adult can only survive in society with a certain amount of knowledge accumulated. This principle implies that an infant must come into the world with a certain minimum stock of knowledge. *This “innate knowledge” is instincts, desires, emotions, sentiments, impulses, and so on* They are knowledge, but they exist in a hardware and biological form. This “arrangement” is similar to that of a computer made before it leaves the factory and can be called “hard-software”⁷. This is one of the ATT applications in psychology.

An “independent third party” can include an individual’s cognitive knowledge of his or her own thinking system. The discrete nature of computations ensures that both the self-objectification of the individual and the mutual objectification of the individual can now be realized. Logics is a kind of knowledge based on human self-objectification, which can be acquired by human brains in the processes of their “self-examinations” or “rehearsals”. Hence, while not providing information about the outside world, logics is considered highly reliable (but still subject to change). In addition, since the pieces of knowledge possessed by an individual about the external world are the “independent third party”, they *may or may not* be consistent with the states of the external world, and the consistencies or inconsistencies may change along with the changes of knowledge. And, by comparing different pieces of knowledge, their differences in quality can be recognized again. *This plurality and mixedness should be inevitable and normal* It is not surprising that a part of knowledge corresponds to an external object, especially since it corresponds to it in its own peculiar way, just like a colorblind person calls a color the “true color” in comparison merely with other colors. Apparently, this doesn’t need a special explanation. The mistake of traditional metaphysics is to over-imagine and over-interpret this “correct knowledge”, mistakenly believing that there is some mysterious thing or mechanism behind it, and thus distinguishing it from other things. Therefore, a large number of “not-so-correct” thinking products (or “opinions”) are clearly separated from the “truth” (or “being”) and discriminated. This began with Parmenides. Since then, philosophy has one-sidedly embarked on the

path of focusing solely on truth and ignoring opinions for more than two thousand years.

Traditional philosophy implies that knowledge systems will eventually be refined and condensed into something simple, static. This perception does not correspond to the realities of knowledge development. It can now be *algorithmically* deduced that a higher quality body of knowledge is also a *larger* body of knowledge, although the development of knowledge about a particular object may converge at some point in time. This general expansive, explosive picture answers in a very concise form to the long-standing unanswered question, namely, the question of the future of knowledge systems (or the world). This provides the basis for a fundamental reversal in the direction of philosophy.

However, the result of a particular instruction processing particular piece(s) of information is assumed to be constant, and at this point knowledge is absolute and “predetermined”. All instructions process all information to produce an infinite database of “human knowledge thesaurus” whose details are not completely known to us. In this sense, we can still conjecture that all knowledge or “truth” constantly exists somewhere among (or “above”) people. In this “human knowledge thesaurus”, each person, each group, or each era occupies only a part of it. Therefore, “subjectivity” mainly refers to the differences between one part of the database and another. The amount of data and the limited computing power both create barriers among them and provide the possibility of their alignments through interpersonal communications and deeper computations.

When algorithmically looking at the history of philosophy, its developmental routes are particularly clear. After the separation of “being” and “opinion” in Parmenides, “being” developed into Plato’s “Forms” (or “Ideas”) and “God” in the Middle Ages, and then into modern “truth” and science. The great reversal occurred in Kant’s transcendental philosophy, a rudimentary form of ATT. Hegel’s attempt to establish a unified system of knowledge was deemed essentially a failure. Since then, “opinion” has continued to develop along the lines of irrational philosophy -- pragmatism -- hermeneutics -- phenomenology -- structuralism, and logics, which started in Greece, has developed into analytic philosophy, philosophy of language, computer science, cognitive sciences, and so forth. These clues (together with rationalism vs. empiricism) finally intersect and unite in Algorithmic Thinking Theory and Algorithmic Philosophy. The failure to discover or pay attention to the discreteness of innate thinking tools can be a key reason why various existing philosophies failed to come to these Algorithmical perspectives. Nonetheless, ATT can be used to prove that philosophy is indispensable in the infinitely developing knowledge system, and the solution to the existing philosophical questions will probably give way to the beginning of new philosophical issues in the future.

The Social Philosophy

Now turn to social philosophy.

By applying the above ontology of minds to human individuals as natural beings, it can “naturally” lead to society, the humanities, and the social sciences. The reason why the existing natural sciences could not be properly extended to the social sciences is that minds have not been able to become real beings in the way described above. Such individuals, who are both objective and subjective, think, make decisions, and act in the world, and then produce social phenomena

and social existences. As a kind of software for interpersonal communication, languages are attached to the thinking system according to the communicational principles provided by computer science, and discourses are another kind of entity produced by combining the contents of thought with specific physical media. This shall be the right way to define language, as well as the philosophy of language.

“Irrationality” is the product of mental distortions according to the above “Algorithmic logic”. In this way, there is a unity between the irrational and the rational. In other words, we use rational methods to dissolve irrationality.

From the principle of “solidification of knowledge” can be deduced rules and institutions which lay the fixed tracks on the road with many options, speeding up computations, but losing a certain quality and accuracy. This shall be a novel and indispensable perspective on institutions. Conflicts, coercions, and struggles must be inevitable phenomena in a society full of subjectivity, which leads to wastes, so it can be understandably profitable to establish social organizations through purchases, negotiations, etc. The subordinate individuals give up certain decision-making rights and obey the orders from the head person and share in the benefits from avoiding the wastes, which creates organizational power. Outcomes of the competitions between free people and organizations depend on the specific composition and functioning of the organization. A core reason for the government to provide public goods shall be the imperfection of market trading measures shaped with bounded rationality. Law is used as a formal kind of institution to regulate major conflicts of interest, and ethics and morality are used as some “informal institutions” to regulate the secondary, relatively “soft” interpersonal relationships. Ethics and morality should be re-interpreted from the perspective of “the solidity and imperfection of knowledge”. This can be a major reversal in the direction of moral doctrines.

However, since stocks of knowledge are only the basis for computational flows, and institutional infrastructures are only the basis for the functioning of society, society must be open to current computations and hence individual freedom. This is the basic logic of the combination of government and market. ATT precisely illustrates the freedom of minds and their limitations. Enormous individuals’ scattered, independent, and autonomous computations, while being somehow repetitive and wasteful, brew great deals of innovation. These tremendous computing capacities must be far superior in sum to those of an authority or center composed of a small number of people. The latter is endogenously lower than the former. This shall be the basic reason for the market economy and the free society. Subjectivity and the versioning of knowledge systems lead to the fact that different individuals can express opposing opinions on the same issue, so that voting or election is used as a “Social Algorithm” to generate public decisions. However, the difficulties of interpersonal communication lead again to the advantages of individual computations over group computations *in some aspects*, which is the source of the emergence of executive power or dictatorship. Centralization is somehow good at carrying out decision-making within a large social context, or imitating knowledge, which is why centralization has certain advantages in helping developing countries to catch up with developed countries. However, as per capita income levels move closer to those of developed countries, the advantages of centralization will be lost, and markets and democracy will regain their attractiveness. Nonetheless, institutional transformation can be difficult algorithmically, and the roundabout production method can be used to illustrate the difficulties. The failure of “shock therapy” in Russia also proved them.

In conclusion, Algorithmic Principles could be used to lay the foundation for a unified social science in almost all its

aspects, and also to make it consistent with the natural sciences. It shall be the first time historically in the fields of philosophy and social sciences that such a persistent logical consistency is established in explaining these many basic social phenomena such as the state, politics, economy, institution, organization, democracy, freedom, market, morality, religion, and culture. One of the mysteries of this consistency is the substantiation, discretization, and then objectification of thoughts. Thus, thoughts effectively acquire an ontological status. Thoughts should be the mainstay and essence of social phenomena. In the literature of extreme rationalism, thoughts are in a specially “weightless” and “non-existent” state. Metaphorically, ATT gives “weight” and “size” to thoughts, then thoughts “exist,” and hence thousands of social phenomena are generated.

The Philosophy of Science and Methodology

Finally, an outline of the philosophy of science and the methodology.

Distortions of thinking lead to thoughtful interpersonal differences as a primary and common Algorithmic phenomenon, and the “*Forced Closure*” of computing leads to the modularity, diversity, or plurality of knowledge. For example, in addition to cognitive knowledge, people will form a variety of engineering knowledge to solve practical problems, scattered common sense knowledge, witchcraft, and religion to answer ultimate questions of the world and their lifetimes, culture and art to entertain and express their feelings and emotions, and so on. These categories of knowledge were made with different methods, from different stages of mental activity, or in different areas; they vary in the degree of intimacy of their internal and interrelated relationships (“Soft Quantitative Analysis”); each has a specific and limited function, and differs in quality. Together, they make up the whole body of human knowledge.

The combination of limited computing power and the thinking economy ensures that knowledge development is divided to a certain extent. In this system of division of labor, it is easy for us to understand the nature, role, and function of science. Science is the cognitive knowledge that is of *relatively* high quality or reliability and is suitable for development and teaching by professional intellectuals. The knowledge of ordinary people is mainly for their own use, while scientific knowledge must be published and disseminated for use by society. The latter implies that science focuses on revealing the properties of objects such as universality, certainty, and constancy. But, like any other kinds of knowledge, the quality and quantity of scientific knowledge that exists in any era is limited and cannot be completely self-consistent. It must be based on common sense and *certain philosophical assumptions*. Its development is achieved through intensive investment, using a *conservative* strategy; that is, it does not go ahead if it does not meet a certain standard. As a result, a series of technical and detailed standards are established that distinguish science from other kinds of knowledge. However, the core truth is that science must be differentiated from common sense and other knowledge to be sold to ordinary people. Ordinary people can learn from science and then turn it into common sense; thus, in the final analysis, there will be no essential difference between science and other kinds of knowledge, but the intensive R&D investment activities that make the intertemporal and technical differences between it and them, and these differences are secured only by means of dynamics.

Since the methods used by scientists can also be used by ordinary people in principle, scientific research cannot have a completely unique method, but only biases some methods against others. Common actors have been studying the world as well. Scientists and common actors complement each other and compete and collaborate with each other; hence, scientists become *a particular category of actors*. This means the integration of ontology and epistemology. From such algorithmic conclusions, we can deduce the appropriate social science methodology, and at the same time, we can also know that the Kuhnian “paradigm” is nothing more than a collection of many relatively closely related elements in the scientific system, which inevitably contains subjectivity; and the paradigm shift, or the “scientific revolution”⁸, like the worldview transformation of ordinary people, or similar to the change of the social system, can only occur occasionally and intermittently on the basis of marginal accumulation⁹.

Conclusion

All of the above discussions are inseparable from Algorithmic Thinking Theory and Algorithmic Principles as the foundation. The reason why the theory and the principles are so useful is obviously that they fill in many elements that have been lacking in the existing knowledge system. The main parts of the existing knowledge system are still valuable and important; when these Algorithmical elements are added, it is as if a catalyst is injected into it, and after a series of active chemical reactions, it is merged into a new whole. This “*Algorithmic Approach*” aims to make use of computer principles while remaining independent of computer science, and then become a special tool for philosophy, humanities, and social sciences, and a basic method for theoretical deduction in these fields. Readers who do not understand the principles of computers should still be able to use it. Moreover, I believe that by elucidating many of the non-traditional mechanisms and characteristics of the human mind, the theory may also be useful for the study of computers and artificial intelligence.

Hopefully, the use of terms such as “computation”, “instruction”, and “algorithm” will not make philosophical and humanistic scholars uncomfortable. In fact, while expanding the rationality and scientificity of relevant fields, ATT has also turned the social sciences humanistic. This synthesis and interpenetration can lead to a unified view of the world and society from some unprecedentedly interesting perspectives, thereby prospectively arousing a great deal of practical research work. It has the potential to make philosophy, humanities, and social sciences all become distinctly productive and creative, and will open up the space for our imagination in the new century.

Footnotes

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² Bin Li, *The Algorithmic Philosophy: A Synthetic and Social Philosophy*. A forthcoming English book.

³ This principle can be found in most textbooks of computer science, which, however, I interpret quite differently from conventional narratives.

⁴ See Böhm-Bawerk, 1891, Chapter II, Book I.

⁵ The idea of the economy of thought can be traced back at least to William of Ockham and was developed by Ernst Mach (see Mach, 1960, pp. 577-595). The reader will find that ATT, by the concept of Mental Distortion, develops it significantly.

⁶ This was called “speed-reliability tradeoff” by Cherniak (Cherniak, 1986).

⁷ Therefore, a piece of hard-software is not acquired postnatally, but antenatally or innately.

⁸ See Kuhn, 1996.

⁹ See Lakatos, 1978.

¹⁰ Since the scope of this article is highly broad, as readers may have realized, please forgive me for listing just the minimum references here.

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