Artificial Special Intelligence

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1 Introduction

1.1 The reductionist idea of science

The reductionist idea of science is the idea that all sciences can be reduced to one of them (typically physics); hence that they are essentially the same. We have seen this idea in the programs and discourses of many famous scientists, coming from various organizations. Today, these are, almost literally, the words of some of the most popular figures in science, and in particular in the field of Artificial Intelligence (AI).

It is clear that if this idea is to preserve any rationality whatsoever it cannot be simply assumed (as some type of eternal property of reality). If this was the case, the idea would take the form of a tautology, a sentence that cannot be addressed rationally: "everything is physics", or equivalently, "everything is water", or equivalently, "everything is god", ... This reduction is to be operated, performed, or realised somehow, leading us from our current state of a plurality of sciences, a symptom of a confusion or misunderstanding, to a different state, to a determined and "physical world".

Therefore, it is clear that this idea of reduction itself cannot be strictly scientific, it has to be an idea of a theory of science (or an ontology, as philosophers say). The fact that these ideas are found in the literature illustrates the need for a theory of science, since one is de facto already being exercised in the field, either implicitly or explicitly, consciously or unconsciously. This is the first ambiguity that has to be pointed.

1.2 Sketch of a theory of science

It is not the goal of this text to present a complete, systematic theory of science. This task would be completely beyond the scope of a text of the character of this. In this context, it will be enough to present some basic principles that any rational theory of science has to assume. At any rate, trying to be explicit about a theory of science, as rough or concise as the effort may be, is better than remaining silent or obscuring the principles.

1.2.1 The inconmensurability principle

The term inconmensurability appears in the philosophical tradition, and more recently in philosophy of science, with different connotations and from different perspectives. Here, the inconmensurability refers, first of all, to an ontological level ("a fabric of reality"), in other words, a fundamental structure of matter and reality.

The principle asserts that there exist different types of matter, and that these differences are not merely accidental, superficial, "simply solvable", but rather, inconmensurable. Another way to think about it is in terms of abstract dimensions each of which is independent and unreachable from the others. These dimensions are the fundamental structure of reality.

The inconmensurability principle is opposed to the reductionist idea of science.

A more concrete example of the inconmensurability principle, only to be considered for illustration purposes, could be the conflicting theories of physics themselves (or the lack of complete unification of this field).

1.2.2 The plurality of sciences principle

From the inconmensurability principle one may naturally infer that to each type of matter there corresponds a type of science: physics deals with "physical matter", biology deals with "biological matter", computer science deals with "computational matter", ... Although this simple notion is possible, not contradictory, and provides a rough approach, it is not necessary and, indeed, too simple. It presents issues we have already hinted.

The plurality of sciences principle has to be understood above all as a negative principle against monism. Because science is the strongest form of normativity and the canon of rationality, and given the inconmensurability principle, a plurality of sciences has to be assumed[1]. Of course, there can be relationships between the different scientific disciplines, but the general methodological principle to characterize a science, and any type of knowledge, is discrimination, and so, plurality.

1.2.3 The techniques as the necessary conditions for the sciences

Here, by necessary conditions, material necessary conditions is meant. Essentially, the techniques are operations with the different types of matter. These operations provide the necessary conditions for individuation, and from that, for the construction of scientific disciplines.

1.2.4 The confusion or contigency principle

Different techniques and different sciences achieve different types and degrees of individuation and rationality. These techniques and sciences meet in the cosmos and this

[1] In fact, this negative character also applies to the inconmensurability principle. Since these are principles of a theory of science (and of a methodology of science) they need not provide positive answers (in the strictly scientific sense).

produces confusion. This confusion is nothing else than the accidental coincidence with respect to the corresponding different norms or measurements of the world. Confusion is therefore also an idea and it can be observed and comprehended, but not at a scientific level.

1.2.5 A connection of this theory with computer science

One of the characteristics of computer science and also of AI, which can be found in the foundational literature, is that it was conceived with the idea of remaining independent of the physical properties of the underlying hardware of the agents. This can be understood as an attempt to conceive an Artificial General Intelligence (AGI). Compared with the proposed principles, this has to be understood critically as a formalism. However, there is a possibly correct interpretation, under a certain notion of intelligence, which follows the idea of Turing and his imitation game. We will come back to this later.

2 Artificial Intelligence

A second popular view of AI is the instrumental view, that is, AI is a tool and therefore necessarily connected to humans. Then, the notion of intelligence relies on some sort of connection or relationship between the machine and the human: the machine makes the human more intelligent and at the same time the machine appears to behave intelligently; but the machine cannot be intelligent without the human. It is possible to consider the human as a strong constraint, a necessary condition in this relationship, while also attributing the notion of intelligence to the machine. Different arrangements may be conceivable; the machine executes most of the work while the human serves as an interface to the world, a messenger, an intention, etc. This complex appears to have more potential when it comes to approaching the notion of an AGI.

Nevertheless, no matter how important or substantial the work of the AI is, under the instrumental view the AI is still simply that, an instrument. It has to be stressed: under this view the machine cannot be intelligent by itself but only when it is connected to the human, while the human can be intelligent by itself.

Therefore, the instrumental view of AI is, at the core, critical of the very notion of computer science as a scientific discipline and some of its foundational concepts. For this reason, no matter how attractive the instrumental notion appears, I will have to reject this notion as too superficial and, most importantly, as contradicting the principles of the theory of science presented and, particularly, in what regards computer science.

3 Artificial Special Intelligence

To solve the contradictions described above I introduce a new concept: Artificial Special Intelligence (ASI). This concept names what is possibly the most evident achievement of computer science, but that has not received attention from the AI community (at least not in the right way or not enough to deserve a name in itself). The most obvious phenomena captured by this concept is the ever-increasing computational power, both in the form of replication and specialization. The concept of ASI is closely connected to the idea of a scientific field as an autonomous process (or institution) that goes beyond the subjectivity of the humans that take part in it. However, this going beyond need not be in the generalization direction since, from the point of view of any given technical process, we must presuppose that any given atom is infinitely complex.

It is obvious that the ideas of specialization and science are closely connected, a connection that is also present in the principles I have sketched above. Then I question, why cannot we think of this specialization as a kind of intelligence? This is particularly plausible given the place that science has in our society, the principles of the theory presented above, but also the way in which the different scientific displines have been historically presented to us. Pondering all of this I claim we are persuaded to accept: ASI is more intelligent than AGI.

3.1 The economical relationship between ASI and AGI

A question that arises immediately from the above is this: what is the relationship between ASI and AGI from an economical point of view? It is obvious that modern economic systems value specialization. But here the problem is that specialization from an economical point of view need not coincide with specialization from a "scientific" point of view. In other words, the notion of specialization (and of intelligence, under this paradigm) turns vague as soon as we start to move away from the inconmensurability principle, as is required by the very principles and methodology of economics.

4 A third view: Artificial Analogical Intelligence

A third view of AGI is Artificial Analogical Intelligence (AAI), another term I would like to introduce in the discussion. Analogical here refers not to a specific type of technology but to a type of reasoning: reasoning among inconmensurables or, in this context, reasoning among scientific disciplines. The instrumental view and the economical view may be understood as specific instances of this one, with the human or the economical institutions acting as "analogical agents". But other possibilities are conceivable.

It is possible to establish a correspondence between this view and the formalist view, originally defended by Turing, if we understand analogical reasoning as some formal scheme of reasoning. This is consistent with the idea of abstracting from the "implementation details" and it is arguably coherent with the imitation game (a literary game) as a test for intelligence. A material interpretation of this view suggests the assumption that a scientific theory of literature is possible (an assumption at least as controversial as such of a science of economics).

5 Notes

It is interesting, even if anecdotical, to observe that the reductionist view of AI contrasts with the European Union one (expressed in the recent regulations): a software product able to operate at a layer of abstraction above all specific industrial sectors. Ironically, the European Union seems less excited about the notion of AGI, more about "plain" AI, while our presentation of these concepts shows that their conception would in fact be more realistically aligned with it.

It is also interesting to note that the popular concepts of strong AI and weak AI would appear to be confused according to the above presentation (ASI is stronger than AGI). Maybe a new naming would solve the confusion: for the popular concept of strong AI I propose open AI.