POST-ALGORITHM: ART AND LIFE IN THE AGE OF AI

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Skills and capacity

Algorithms are prevalent in all aspects of our lives, be it in our institutions, bureaucracies, or even in our computers. They are also not new; artefacts suggest they have been dictating religious rituals and ceremonies since the start of civilisation. Arguably, algorithms have existed as a crucial component of human society since humans began living together, and are embedded in our customs, ethical codes, and laws.

But what is an algorithm? It is a procedure or a set of rules for problem solving. In mathematics and computer science, an algorithm is a finite sequence of well-defined, computer-implementable instructions. It comprises a series of components, and a set of certain rules that govern them. These components are settled in a framework called modularity.

Algorithms take in input, follow the procedures, and produce the results automatically, without disputes or controversies. Because of the modularity, algorithms can easily be standardised. Like blocks of lego, they can be used repeatedly, combined and layered. This allows the same formula to be used more than once, allowing algorithms to generate volumes of new information about the world.

A world created by such standardisation is what we call the algorithmic world.

Many good things happen in the algorithmic world. As algorithms bring order to chaos, they allow for resources to be deployed in proper ways so civilisations can form. Algorithms also dictate how we should behave in public—in fact, schools prepare us for such an algorithmic world by teaching us things

like how to keep time, wait in queues, and do assignments.

The algorithmic world has progressed and prospered in line with humanity's pursuit of efficiency, and some might even say that algorithms have developed in tandem with our pursuit of happiness. After all, with algorithms, we have been able to reduce hunger and extend our life expectancies. It has enabled many services in our lives to grow in quantity and fall in price—and while the economy grows fast, algorithms grow faster.

Problems in the algorithmic world

However, the algorithmic world has its dark sides as well. This opacity of algorithms is ever-increasing as we move from simple societies to the modern world where knowledge and expertise are specialised. In this concealed algorithmic world, life is not transparent. Obtaining the information about the system is difficult, if not impossible.

A major question is the "black box" problem: if we do not know which algorithms control us and how they work, how do we participate in the decision-making process?

While opacity is a serious challenge in itself, what is even more problematic is that it makes us passive. After all, if we do not understand the decisions made by the system, then we cannot reflect on them. We will not take responsibility for the outcome and this "thoughtlessness" can lead to "banality of evil" (Arendt 1963), meaning that that in the process of following rules we think are familiar, we may unwittingly inflict terrible things on someone else's lives or on our own.

While political leaders and specialists make algorithms for us, we have no way of knowing that what they make is what we want. After all, what guarantees that their objective concurs with ours? This has been the persistent problem of representative democracy and bureaucracy—in addition to the "black box" problem, there is also what some computer scientists call a "value alignment" problem, all of which diminishes the attractiveness of the algorithmic world.

The third problem with the algorithmic world is how it treats outliers. To understand, just think about your school days and how punk kids were treated by the authorities. No matter how much fun they had, those outliers were cast aside. Many of those misfits later become artists and entertainers, and in some cases even great scientists and entrepreneurs who changed the rules of the game. They rejected the prevailing algorithms, and the algorithms rejected them in return. The result was unpredictable—some ended up in jail while others became superstars.

In some ways, the algorithmic world of modernity is as Foucault says, a "prison with panopticon" (Foucault 1977). When we are imprisoned, we internalise the algorithms, and follow the rules voluntarily even in the absence of coercion.

How AI deepens the problems of the algorithmic world

The advent of Artificial Intelligence (AI), or machine learning to be precise, intensifies the problems of the algorithmic world. Opacity vastly increases with rising complexity of AI's decision-making structure. It is practically impossible to know, let alone to reflect on, how a certain outcome is made through algorithmic procedures.

Biases in data are inscrutable as well. Even though we know they exist, we have no idea how large and skewed they are, and we do not know how to correct them. Furthermore, inherent biases in algorithms themselves are virtually undetectable except by AI experts. The "black box" in machine learning algorithms has become so large that it makes us humans feel small and impotent. Ironically, this feeling of impotence makes us rely on the machine even more.

But this begets the question: How can we be sure that the objective of the algorithm aligns with our goal? Stuart Russell illustrates this dilemma with what he calls the King Midas Problem (Russell 2019). "Suppose you ask your AI robot to go and fetch you a cup of coffee quickly," he says. "Your robot will rush to the Starbucks next door and knock out all the people in the queue to get you that coffee." How can you specify all the possible scenarios that can happen in the real world when fetching a cup of coffee? Though the robot has deep learning algorithms installed, the mistakes it makes until it is properly trained could be costly. As a solution for this value alignment problem, Russell proposes "provably beneficial AI," which consults humans at each decision-making stage. This is an emerging concept among researchers.

The challenge comes when on one end of the spectrum there are somewhat obtuse humans who do not always know what they want, while on the other end, there is a super-efficient computer that is ready to execute any command thrown at it. This combination of the two is worrisome as it may result in the algorithm not just performing the wrong actions, but also at the speed of light and on a planetary scale. Moreover, like the commonly used ethical dilemma of the trolley problem, many problems in the real world do not have a single right answer or solution we can conveniently engineer.

The underlying rationale for modern algorithms is utility maximisation. This is a concept that originates from utilitarianism, In utilitarianism, the pros and cons are weighed for a cost-benefit analysis and the path chosen is the one that brings about the maximum wellbeing or happiness for everyone. In machine learning algorithms, however, utility maximisation is reduced to cost minimisation, or a minimisation of errors. Only half the story is told, because cost minimisation is necessary but not sufficient for utility maximisation. In other words, although it may improve efficiency, cost minimisation does not always lead us to maximum wellbeing or happiness.

The underlying principle of utility maximisation in algorithmic decision-making leads us to more fundamental questions like: How is utility defined and denoted? And whose utility we are maximising? The challenge is that utility maximisation does not give a detailed account on the objective itself. Also, the objective of cost minimisation in AI algorithms is regarded as exogenous and does not elucidate the validity of the goal itself. In this regard, utility maximisation is rightfully criticised as instrumentalism, which is not surprising since utilitarianism has been at the receiving end of criticism for its benign ethics of seeking maximum happiness since its inception in Jeremy Bentham's time.

Errors matter

The incredible efficiency of machine learning algorithm is forcing us into an increasingly standardised world. Traditional, institutional, and social norms are being turned into new statistical and computational norms. As Matteo Pasquinelli points out, "the ultimate limit of AI models is found in the inability to detect and to predict a unique anomaly, such as a metaphor in natural language. The main effect of machine learning on society as a whole is cultural and social normalisation." (Pasquinelli 2019, 1-17).

Decreasing diversity in the cultural sphere can be a serious concern simply because without diversity, culture cannot flourish. Recent studies show that recommendation services like Spotify decrease an individual user's range of consumption, while simultaneously increasing dissimilarity across individuals. This trend is called balkanisation of tastes. Balkanisation only expands because recommendations are optimised to drive consumption. In other words, efficiency from the viewpoint of commercial interests means that we are limited by our past data and by the average established by users with similar consumption profiles.

It would appear that little serendipity or surprise awaits us in the algorithmic world. But is that true? Computer engineers try to emulate serendipity and surprise by inserting random components or artificial errors into algorithms. The question is if this will feel the same as an organically derived, real error. It is also an open question because our tastes and aesthetics are also changing as we evolve alongside machine algorithms. This is obvious from how children nowadays have little qualms about carrying out animated conversations with Alexa, Siri, and other digital objects. In fact, they treat these digital beings as real as physical beings.

Ultimately, AI kills errors. It starts from cleaning the data, eliminating anomalies, outliers and odd errors, all in the name of ensuring efficiency. But what are errors after all? They come from you and me and our limited knowledge of the world. They represent the complexity of the world and of human beings. When we push the bounded rationality of mathematical decision-making models too far, they also show the limitations of rationality. It is because of these errors that we can see the folly of rationalising everything with

algorithms. Decades ago, this form of AI, called Symbolic AI, and the questions that came with it, eventually caused the AI winter, a period of reduced funding and interest in artificial intelligence research (Simon 1984).

Since then, AI has been reborn with neural networks and machine learning algorithms which substitute intelligence with pattern recognition. Unlike Symbolic AI, these new AI algorithms do not require rationalising, theory, or science in the traditional sense. It is a new breed of rationality based on statistical inference where information becomes logic. Accordingly, the nature, scale, and the implication of error is rarely discussed. Research is focused on tricks that minimise errors. As Pasquinelli noted in his criticism of machine learning algorithms: "A paradigm of rationality that fails at providing a methodology of error is bound to end up, presumably, to become a caricature for puppetry fairs, as it is the case with the flaunted idea of Artificial General Intelligence (AGI)." (Pasquinelli 2019, 1-17).

Art as antidote for algorithms

Artists by nature are anti-algorithm. Art resists programming both social and technological. By rethinking, reshaping and repurposing what is given, artists constantly pursue what lies outside the box. They are de facto anomalies of our society. The more out of the box they are, the more we praise them as being original and creative. We value artists precisely because they liberate us from programs and algorithms.

John Cage is an artist renown for his anti-algorithm programming. He shocked the audience with his piece *4'33"* (Joel Hochberg 2010). The performer, a pianist, appeared on stage impeccably dressed, bowed to the audience, and sat down to play. Then he stayed motionless for exactly 4'33". One could hear the noises made by the audience—they were coughing and shuffling, feeling uneasy and bewildered. Cage was following the protocol of a concert, or at least the attire and stage manners, but he flipped the program by presenting the noise, or errors, as the artistic content to be appreciated. In those few minutes, John Cage showed the essence of art as anti-algorithm.

Artists inspire us because they show us ways to overcome algorithms. While efficiency is the supreme goal of our society, art reminds us there are other important values as well, like autonomy and aesthetics, just to name a few. And indeed, goodness of heart, truthfulness, and beauty—three prime values we all yearn for, are unfortunately unattainable by algorithms. They require not formulas, but the human heart, mind, and body. Life in the 21st century calls for a revival of what it means to be human in the face of cascading algorithms. Art is a good place to start.

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