Digitizing Intelligence

By Avi Loeb on January 16, 2021

Could digital art, documented in *Non-Fungible Tokens* (NFTs), reproduce real art? In principle, a laser beam could scan the three-dimensional (3D) structure of the paint shaped by Pablo Picasso's brush strokes and convert his art to a digital form that can be reproduced exactly by a 3D printer. Once a computer algorithm is trained on a large set of Picasso's paintings, it might be able to complete some of his unfinished paintings, in the same way that an artificial intelligence (AI) algorithm completed recently Ludwig van Beethoven's unfinished Tenth Symphony.

If works of art can be digitized, then other trademarks of intelligence can be also be reproduced by our AI systems.

For me, the most pressing question these days is whether AI algorithms can distinguish an artificial extraterrestrial object from familiar objects in the sky, such as a comet, an asteroid, a meteor, or an atmospheric phenomenon? This is the goal of the newly established *Galileo Project* that I am privileged to lead.

The simplest method to address this task was defined by Arthur Conan Doyle in "*The Case-Book of Sherlock Holmes*", where he stated: "*When you have eliminated all which is impossible, then whatever remains, however improbable, must be the truth.*" Deduction by elimination is the best way for a caveman to conclude that a cell phone is not a shiny rock, based on the device's ability to record voices and images. Similarly, when analyzing new data from telescopes, the AI algorithms of the *Galileo Project* could separate unfamiliar objects from those that are natural - like birds and meteors, or human made – like drones and airplanes. This could be part of a learning experience because: "*Whatever remains, however improbable, must be the truth*."

An artificial object from an extraterrestrial origin can be distinguished from a terrestrial object, not just by resolving unusual bolts or labels imprinted on its hardware but also by noticing unusual behavior while physical markers remain unresolved. Behavioral anomalies include motion at unprecedented speeds or accelerations, not accessible to human-made or natural phenomena, as well as intelligent activity - seeking information or responding to circumstances in ways that cannot be mimicked by familiar objects. We use behavioral traits routinely in our daily life to recognize intelligent people even before engaging with them. The combination of unusual physical and behavioral characteristics could establish the case for extraterrestrial technological equipment beyond a reasonable doubt.

Once extraterrestrial equipment is identified, the main challenge shifts to figuring out its purpose. After all, knowing the intent of visitors to our home is of upmost importance in guiding us how to engage with them. An encounter with an extraterrestrial visitor could be easily misinterpreted, as in the *Trojan horse* story of Greek mythology, especially if the

guest's AI system is far more advanced than our natural intelligence. In addition, the extraterrestrial hardware may take advantage of the physical reality that goes beyond our current scientific understanding. This would be natural if the object was manufactured by a scientific culture whose scientific knowledge base was far more advanced than our century-old understanding of quantum mechanics and gravity.

We are confident that our understanding of the universe is incomplete, because we label two of its most abundant constituents as "dark matter" and "dark energy", for lack of a better knowledge of their nature. We only know that dark matter induces attractive gravity like the ordinary matter we find on Earth, whereas dark energy induces repulsive gravity - triggering the accelerated expansion of the Universe.

If an extraterrestrial technological civilization was able to harness these unknown but most abundant cosmic constituents to fuel the propulsion of its engineered vehicles, the *Galileo Project* telescopes would not detect the standard exhaust plumes that usually surround human-made crafts.

The known laws of physics and mathematics must apply to all technological civilizations that ever existed in the 13.8 billion years since the Big Bang. Nevertheless, there might still be propulsion and communication capabilities beyond our imagination, consistent with our current knowledge. In that case, an encounter with extraterrestrial equipment will educate us about nature itself and not just about the existence of other civilizations beyond ours. The new lesson about nature might be far more important because it will broaden our understanding of the universe at large. The eureka experience would be similar to the caveman learning about distant landscapes, far beyond those experienced, based on the images stored in the cell phone that was discovered.

Our AI systems might recognize new knowledge from superior intelligences even if we cannot reproduce their creations, just like most of us are unable to imitate Picasso or Beethoven. Here's hoping that our technological kids, namely the AI systems we develop, will do better than humans. In the bigger scheme of the universe, the sky is the limit.

ABOUT THE AUTHOR

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