

# Musical Intelligence for the Future

By Professor Andy Miah

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It may be no coincidence that Eduardo Miranda refers to his compositions as 'recombinant' processes, as this concept alludes to a way in which we might regard them as forms of biotechnological mutation, engineered to bring about new species categories. After all, Miranda's work leads to the existence of new forms of musical experience and new ways of thinking about composition and creativity.

As with any biological mutation, the role of the creator in these compositions is difficult to specify. While certain processes begin with clearly defined interventions, the creative work also takes on a life of its own, intervening and changing the course of the final creation. We may even think of artwork generally in a similar way, whereby the artist's influence on the final composition is understood as only one part of the series of processes that lead to the final work. When utilizing artificial intelligence to create art, this ambiguity is even more apparent.

Miranda's compositions may be the first to answer the complex question of whether machines could ever approximate the kind of intelligence required to create music. In so doing, his work extends a number of discussions that have taken place in recent years about the possibility of artificial intelligence, the role of science and art collaborations, and what it is to be human.

When discussions about artificial intelligence gained prominence back in the 1950s, scientists, most notably Alan Turing, developed elaborate tests to ascertain what would count as intelligence. Turing's classic test specifies that, if it is possible for a computer to fool a human being into believing that it is also human (through conversing on a computer screen), then we must conclude that the computer has the same degree of intelligence as a human.

Many have disputed his proposition. For instance, Searle considers that Turing's test is misleading and, instead, analogizes it to his now famous "Chinese room" interpretation. Here, Searle asks that we imagine a room with a person in it who receives Chinese symbols through a slot in a door. The person has a manual that allows him or her to match up the Chinese symbols with the English counterpart and thus, the person can output the translation. To anyone outside of the room, it would appear that the person has translated the Chinese words and thus understands their meaning. In actual fact, the person has demonstrated merely a capability for pattern matching and has no real understanding of the meaning of the Chinese symbols.

Thus, Searle argues that, even if the computer were able to fool another human into believing that it was talking to another person, this would not

indicate intelligence. Instead, it would show how a computer program is able to demonstrate a grasp of syntactic rules, thus appearing intelligent through a comprehensible conversation. However, Searle contends that it would lack any comprehension of the semantic quality of words, including those ascribed to the emotions, which are considered as constitutive of that which defines human intelligence.

The example reveals a disparity within research about artificial intelligence that is premised upon its artificiality standing against some, supposedly, natural intelligence. Furthermore, such natural intelligence tends to be directed towards that exhibited by a human being. Thus, it implies that if anything should be considered intelligent, then at least we must grant that humans are.

Since Searle, few tests of intelligence have examined the creative process or the creation of art, as a way of establishing whether machines are now intelligent in the same way as humans. Moreover, the role of AI in creating musical compositions is a very new contribution to the debate about what we should understand as intelligence. Yet, the key question remains the same: If only machines could create beautiful music, would we then be willing to credit them with the kind of intelligence that matters to humans and, if so, what would this mean?

We may accept that a number of forms of human intelligence could be replaced by the work of machines. Indeed, the industrial revolution was the beginning of this process. Over one hundred years later – and 200 years since the Luddite uprising against technology - it is clear that humans still have a role to play in their societies, but this role has changed. In developed countries, the work force has shifted away from manual to intellectual tasks. However, in the last twenty years, even these aspects of our contribution have become increasingly unnecessary, as technologies such as the Internet have created a meta-mind, capable of yielding all forms of knowledge.

Thus, Miranda's work addresses the last bastion of human relevance, the capacity to make art and for it to provide insight and meaning that conveys what matters to us about being human. In a world where the creation of music may no longer require participation from humans, then we may truly accept that our unique selling proposition has been compromised.

However, this would be too simple an interpretation of the work, and the age-old thesis that artificially intelligent machines would make humanity redundant needs considerable revision. These compositions provide such a reinterpretation, suggesting how creative collaboration between machines and humans may provide a new chapter in our thoughts about artificial life forms.

They also suggest how the role of the scientist may be changing, as the boundaries between scientist and artist are collapsing. Over the last 10 years, numerous artists have begun to work within science to explore ways in which biology might be utilized as an artistic medium. These works vary remarkably, from the transgenic fluorescent rabbit of Eduardo Kac, to the surgically sculptured, stem-cell-generated human ear by Stelarc.

Thus, Miranda's compositions must also be situated within a range of innovations taking place within the fields of art and science today, whereby the role of each form of expertise is becoming increasingly fuzzy. It also speaks of the broader history in experimental music, which encompasses such artists as John Cage, Steve Reich, Laurie Anderson, Kraftwerk, and Maywa Denki, each of whom may be seen as musicians and technicians.

In this respect, we must also note how developments within popular music, which – perhaps since the Beatles – have shifted towards the manufacturing of commercial music products, as if to suggest that artistic insight is made rather than discovered. Perhaps the pinnacle of this era was reached in 2005, with the Japanese girl band *AKB48*, consisting of around 50 members was created. This idol band consists of 3 teams of girls, who rotate live performances creating a band that will outlive the lifetime of its members by continually replacing performers with new, cloned singers and dancers.

Would we feel confident in claiming that the countless boy and girl bands that have emerged through such media systems as X Factor or American Idol demonstrate any greater creative value than the music created by artificially intelligent computers? I suspect not, but in the same way that contests between robots are not as interesting as contests between humans, computer generated music must find its own route into culture, as has been accomplished by other musical forms.

As Miranda's compositions demonstrate, none of these developments mean spending any less time learning to read music or play instruments, quite the contrary, they rely on an advanced knowledge of such practices. Instead, it means that reading music may be an art cultivated in parallel with learning computer programming, neuroscience and even some molecular science.

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