COURTESY THE ARTIST AND TABARI ARTSPACE, DUBAI, UNITED ARAB EMIRATES

Tiberius #02 *and* Tiberius #04, *collages by Hazem Harb, whose work was on view in March at Tabari Artspace, in Dubai, United Arab Emirates.*

and inferences that cascade from those connections. The Translate network's map does it easily because it is multidimensional, extending in more directions than the human mind can conceive. Thus the space in which machine learning creates its meaning is, to us, unseeable.

Our inability to visualize is also an inability to understand. In 1997, when Garry Kasparov, the world chess champion, was defeated by the supercomputer Deep Blue, he claimed that some of the computer's moves were so intelligent and creative that they must have been the result of human intervention. But we know quite well how Deep Blue made those moves: it was capable of analyzing 200 million board positions per second. Kasparov was not outthought; he was outgunned by a machine that could hold more potential outcomes in its mind.

By 2016, when Google's AlphaGo software defeated Lee Sedol, one of the highest-ranked go players in the world, something crucial had changed. In their second game, AlphaGo stunned Sedol and spectators by placing one of its stones on the far side of the board, seeming to abandon the battle in progress. Fan Hui, another professional go player watching the game, was initially mystified. He later commented, "It's not a human move. I've never seen a human play this move." He added: "So beautiful." Nobody in the history of the 2,500-year-old game had ever played in such a fashion. AlphaGo went on to win the game, and the series.

AlphaGo's engineers developed the software by feeding a neural network millions of moves by expert go players, then having it play itself millions of times, rapidly, learning new strategies that outstripped those of human players. Those strategies are, moreover, unknowable—we can see the moves AlphaGo makes, but not how it decides to make them.

The same process that Google Translate uses to connect and transform words can be applied to anything described mathematically, such as images. Given a set of photographs of smiling women, unsmiling women, and unsmiling men, a neural network can produce entirely new images of smiling men, as shown in a paper published in 2015 by Facebook researchers.

A similar process is already at work in your smartphone. In 2014, Robert Elliott Smith, an ar-