How to get robots to learn the way humans do

May 29 2018, by Bob Yirka

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Matthew Hutson, a freelance writer, has published a Feature article in the journal *Science* outlining progress in getting computers to learn and to think more like human beings. In his article, he suggests that a lot of problems will need to be solved before machines can learn to think the way people do. And at its root, he suggests, it will require figuring out

how to get computers to learn both by trial and error and through baked-in features that correspond to instinct.

As Hutson notes, deep learning network-based systems have accomplished extraordinary things, such as beating humans at very difficult games or learning to flip hamburgers. But they still lack the ability to apply what they have learned to new and different environments. A chess-playing robot able to beat the best human player in the world would still lose when asked to play a game of checkers with a child. They also lack common sense. As a simple example, Hutson cites asking a robot butler to retrieve a red cup from the cupboard—how should it respond if there are no red cups in the cupboard? Instead, the cabinet is stocked with cups of other colors and plates that are red. A human would most likely choose a cup of another color rather than a red plate that partially matches the request, because she would understand the intended use of the required object. But how do we get robots to do that?

To get robots to be more able to handle real-world, random scenarios will likely involve getting them to learn the way humans or other animals learn. This will likely will require going back to the original design—the human brain. He suggests researchers like Gary Marcus of New York University as key developers. Marcus is a developmental cognitive scientist involved in research aimed at studying how humans learn from birth onward. Researchers like Marcus, Hutson suggests, are searching for the means by which humans and other animals are endowed with instinctual behavior. Indeed, Marcus has come up with a list of human instincts that he believes will need to be baked into computers before they ever learn things like causality and assessing cost-benefit situations.

Hutson notes that some computer scientists are jumping on such new ideas and he lists companies like Vicarious, in California, and DeepMind in England, which are hard at work trying to implement them. He also

cites ongoing research efforts in places like MIT and the University of New South Wales, where teams are trying to learn how the human brain works and how machines can be made to function the same way.

More information: Matthew Hutson. Basic instincts, *Science* (2018). DOI: 10.1126/science.360.6391.845

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