

How researchers are teaching AI to learn like a child

June 06, 2018

It's a Saturday morning in February, and Chloe, a curious 3-year-old in a striped shirt and leggings, is exploring the possibilities of a new toy. Her father, Gary Marcus, a developmental cognitive scientist at New York University (NYU) in New York City, has brought home some strips of tape designed to adhere Lego bricks to surfaces. Chloe, well-versed in Lego, is intrigued. But she has always built upward. Could she use the tape to build sideways or upside down? Marcus suggests building out from the side of a table. Ten minutes later, Chloe starts sticking the tape to the wall. "We better do it before Mama comes back," Marcus says in a singsong voice. "She won't be happy." (Spoiler: The wall paint suffers.)

Implicit in Marcus's endeavor is an experiment. Could Chloe apply what she had learned about an activity to a new context? Within minutes, she has a Lego sculpture sticking out from the wall. "Papa, I did it!" she exclaims. In her adaptability, Chloe is demonstrating common sense, a kind of intelligence that, so far, computer scientists have struggled to reproduce. Marcus believes the field of artificial intelligence (AI) would do well to learn lessons from young thinkers like her.

Researchers in machine learning argue that computers trained on mountains of data can learn just about anything—including common sense—with few, if any, programmed rules. These experts "have a blind spot, in my opinion," Marcus says. "It's a sociological thing, a form of physics envy, where people think that simpler is better." He says computer scientists are ignoring decades of work in the cognitive sciences and developmental psychology showing that humans have innate abilities—programmed instincts that appear at birth or in early childhood—that help us think abstractly and flexibly, like Chloe. He believes AI researchers ought to include such instincts in their programs.