

Reading Response

The Promise of Artificial Intelligence - Reckoning and Judgment Chapters 5-7, 13

This reading response will center on chapters 5-7 and a short conclusion of Cantwell Smith's book on *The Promise of Artificial Intelligence - Reckoning and Judgment*. The author begins with chapter 5, an introduction to contemporary machine learning (ML) and its improvements over GOFAI's failures. The reading states that GOFAI had four failures:

1. Neurological
2. Perceptual
3. Ontological
4. Epistemological

The reading argues that contemporary ML have improved on the neurological and perceptual failures of GOFAI with minimal improvement on the ontological and epistemological.

Contemporary ML have achieved this with techniques (neural networks) that are topologically similar to how the brain is organized. The rest of chapter 5 understands contemporary ML with four facts:

1. Correlations
2. Learning
3. Big Data
4. Computational power.

Rather than putting heavy emphasis on correlated variables, contemporary ML centered on mapping inputs to outputs. It accomplished this through *training* on large amounts of data to mimic "learning" using phenomenal amounts of computational power to run multiple iterations.

However, despite all these new advancements in ML, the author argues and concludes in chapter 13 that ML has still not figured out what it really means to think.

Chapter 6 and 7 focuses on assessing to what extent contemporary ML has improved on the four failures of GOFAI and epistemological challenges. Neurologically, contemporary ML to some extent, does mimic the human brain. However, no one knows whether this is the best route to general intelligence or the only one, making it impossible to assess if contemporary ML has the best possible neurological capabilities for general intelligence. Perceptually, the reading argues that contemporary ML seems closer to the mark. The author uses the impressive example of facial recognition as an argument for perception, however states that it is still far from perfect. In terms of ontological and epistemological failures, a contemporary ML model only draws indirect conclusions without knowing what it is talking about which is still consistent with the failure of GOFAI.

A critical point

One critical point I would like to develop more about the reading is the epistemological challenge of contemporary ML. The reading makes the argument that despite the promise contemporary ML shows, it does not demonstrate that it understands what it is “learning.” This is a very strong argument, machines can excel at their task but not truly understand their task or the purpose of their task.

This argument is extremely interesting and important to the future of ML and the popular debate on if it will ever be able to achieve general intelligence. An “intelligent“ artificial model can tell a student the perfect translation of an English word to a French word. A tutor with a dictionary who does not understand a single word of French is also able to tell the student the perfect translation of an English word to a French word. The tutor does not understand a single

word of French but performs the *same* actions as the “intelligent” model, implying that the “intelligent” model is not so intelligent and does not really understand that it is translating French to English words. The author makes very strong arguments that contemporary ML, despite all its promises, faces many epistemological challenges. It is not comparable to human-level intelligence and judgment which have been refined throughout the last thousand years.