

CSC416 Foundations of Artificial Intelligence

Beyond AI Study/Discussion Guide

Chapter Title: Autogeny

Top Ten Salient Sentence Blocks

1. “There are 206 bones in the human body. They are simply and certainly structural elements. We can make structural elements, and indeed of better material than bone: aircraft-grade aluminum or titanium alloys, carbon fiber composites, and so on. We can build significantly better hinges than the human joints, thank you.” (p. 134)
2. “We now have a robot that, under remote control, is capable of standing in for a human in activities ranging from casual conversation and office work to golf and home repair. Such a robot would be, as current-day AI programs are, an extremely useful thing to have.” (p. 134)
3. “If you build a small robot, it will not grow up to be a big one.” (p. 135)
4. “The heart is not just a pump, it is a pump that can grow from a small pump to a large pump while operating continuously the whole time.” (p. 135)
5. “But he [Turing] did propose a ‘more expeditious’ method: program an imitation of a child mind and then educate it to adulthood.” (p. 137)
6. “A different way to characterize the AI glass ceiling is to notice that the things AI systems can do well are the things that humans have learned to do, and thus the ones that we know how to do.” (p. 138)
7. “So far, the robots are up to about the level of perhaps the lower vertebrates. The most celebrated one is probably Rodney Brooks’s GENGHIS, a six-legged crawler that learned to crawl.” (p. 139)
8. “The Navier-Stokes equations for fluid flow, for example, had been around since 1822, but scientists still refused to believe that machines could fly until they saw it done. Once they did, they explained handily using the equations: ‘Oh, of course, we knew this all along.’” (p. 140)
9. “A robot with hands as good as a human’s would have an alternative path to autogeny: it could build subsystems for itself in a workshop, just as we imagine building such a robot in the first place.” (p. 142)
10. “If you read a book every day over the entire course of your life, you’d pull in about twenty-five times as much information as is present in the raw genome. This tends to confirm Turing’s estimate that the child machine could be significantly simpler than the developed mind.” (p. 144)