

COSC 387: Artificial Intelligence

Points for Discussion

December 8th Class

1. In chapter 8 of Hopcroft and Ullman’s “Introduction to automata theory, languages, and computation,” they provide several examples of undecidable problems; that is, problems for which no algorithmic solution exists. And they *prove* that these problems are undecidable. In this class, we have studied proof procedures for propositional and first-order logic, so we may ask if we could construct a proof procedure to determine whether a given problem is undecidable. But, of course, if this were so, then we would have a decidable procedure (i.e., the proof procedure) for determining whether problems are undecidable, which is, in theory, impossible, by definition of an undecidable problem. Nevertheless, the proofs for such problems are in Hopcroft and Ullman’s book in black and white. So what implications does this have for strong AI and generally intelligent machines?
2. Physics, genetics, and AI are the three disciplines best poised to destroy our world. What if, in the search for an illusive elementary particle, physicists start a chain reaction that reorganizes all matter in the universe? What if, in the search for higher yielding plants, genetic engineers create an organism that is a human-made equivalent of the *Ebola* virus? And what if, in the search for generally intelligent automata, AI researchers create a machine that perceives humans as threats rather than masters? Assuming that the strong AI project is possible, what ethical responsibilities do researchers in AI have?
3. The brain is the existence proof that intelligence is possible—at least as humans perceive intelligence. We will eventually have a theory of the brain, which, in all probability, will be electro-chemical in nature. What prevents us from simulating these same electro-chemical processes using a computer, thus producing an intelligent machine?