
Assignment 3

Moravec's Paradox

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Moravec's paradox is the observation by artificial intelligence and robotics researchers that, contrary to traditional assumptions, reasoning requires very little computation, but sensorimotor skills require enormous computational resources. It means that activities like abstract thinking and reasoning or skills classified as “hard” — engineering, maths or art are way easier to handle by machine than sensory or motor based unconscious activities. It's much easier to implement specialized computers to mimic adult human experts (professional chess or Go players, artists — painters or musicians) than building a machine with skills of 1-year old children with abilities to learn how to move around, recognize faces and voice or pay attention to interesting things. Easy problems are hard and require enormous computation resources, hard problems are easy and require very little computation.

Researchers look for the explanation in theory of evolution — our unconscious skills were developed and optimized during the natural selection process, over millions of years of evolution. And the “newer” skill is (like abstract thinking which appeared “only” hundreds thousands of years ago), the less time nature had to adjust our brains to handle it.

It's not easy to interpret Moravec's paradox. Some tell that it describes the future where machines will take jobs which require specialistic skills, making people serving an army of robotic chiefs and analysts. Others argue that paradox guarantees that AI will always need an assistance of people. Or, perhaps more correctly, people will use AI to improve those skills which aren't as highly developed by nature.

For sure Moravec's paradox proves one thing — the fact that we developed computer to beat human in Go or Chess doesn't mean that General Artificial Intelligence is just around the corner. Yes, we are one step closer. But as long as AGI means for us “full copy of human intelligence”, over time it will be only harder. The main lesson of thirty-five years of AI research is that the hard problems are easy and the easy problems are hard. The mental abilities of a four-year-old that we take for granted – recognizing a face, lifting a pencil, walking across a room, answering a question – in fact solve some of the hardest engineering problems ever conceived... As the new generation of intelligent devices appears, it will be the stock analysts and petrochemical engineers and parole board members who are in danger of being replaced by machines. The gardeners, receptionists, and cooks are secure in their jobs for decades to come.