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Week 10

I like the three readings since they take strong computational flavor. "A common coding between conceived and generated actions" [the Andrew reading, abstract] is a great idea to make computation/machine learning much easier, and in my opinion, coincides with the essence of modern statistical learning theory.

In simple words, when we try to learn a system with n variables, each of which takes 2 values, we generally need to try all 2^n combinations, which is the notorious "curse of dimensionality" scenario. But fortunately, the n variables might restrict each other. For example, they might distribute on a plain. In this case, having 3 examples in minimum suffices.

The same applies to the situation when a system (i.e. robot) has both perceptions and actions. It is generally very hard for systems to communicate the "knowledge" they learned with each other. But if the system is a Markov decision process with linear value functions (or action functions), and the set of features is compatible across systems, then learning is as simple as solving a linear system.

Of course, we can dump the memory of one robot and load the dump to another robot. But in the case of copy the knowledge of one person A into another person B, we need to cope with billions of neuron cells and combining the knowledge of A and B is not a trivial task. In comparison, solving linear systems might be much easier.

Review of "What imitation tells us about social cognition: a rapprochement between developmental psychology and cognitive neuroscience"

My first thought upon reading this paper is Basulou, too, which is the same as Stephanie. Basolou also mentioned that "it is only in the past 15 years that neurophysiologic evidence started to accumulate" (2(b) paragraph 1). His topic is that language/action/perception of the same scenario triggers similar EEG/ECG patterns and that verbal cue makes compatible actions faster.

Another thought is about self-consciousness and common ground. 1. When an animal is facing a mirror, will it realize that it is himself in the mirror? Will it realize it is the same species? Will it try to find the animal behind the mirror? I read that many species of monkeys do not know that the animal in the mirror is itself. 2. I believe that different animals do have common ground based on their similarities. For one example, when a cat gets sick, a dog living in the same house feels sad. For another example, when a human or a dog looks at another human or another dog from behind, they **do** be able to realize it, and this capability is innate.