

Problem 1: Article Summary:

The paper analyzes GPS to simulate human thought for problem solving. GPS maximally merges the concepts of machines copying humans and machines solving problems that humans solve. It begins by illustrating the history of theoretical mind models. They then performed an experiment in which an engineering student solving a problem. The steps, and thought processes conveyed in text were converted into protocol for a generic solver.

GPS essentially repeatedly performs 1 of 3 tasks:

1.Transform A to B

- If doable

2.Reduce difference D between A and B

- This is the difference between finishing a goal and what is present

3.Apply operator Q to A

- Conditions for operator must be met first

GPS sets up subgoals to reach major goals. There is also a step to see if a goal can feasibly be reached. They then analyze the conversation and problem solving of the test subject. In this, they find many similarities between GPS and the human interaction, they did however find a few key differences.

It is interesting to note that the subject perceived his inward thoughts as being separate from the external thoughts which GPS could not handle. Second, the subject narrows the search space to the specific problem. Third, hind sight is not present in GPS, but was displayed by the test subject.

The ability to utilize degrees of freedom seems lost to GPS. The author concludes essentially that these items will need to be addressed and that one subject in one experiment may be insufficient to derive these idiosyncrasies.

This is incredibly cool! It however is not enough for true intelligence. In addition to the authors observed differences, I'd also add that operations must be automatically learned through cause and effect observations. Also, there must exist a reward structure to place some measure of importance on some goals over other goals. These are two things that I think most people would agree humans do readily. I don't think GPS as it is illustrated in this paper will ever be enough even with the computing power of the human brain or multiple human brains otherwise.