

ASSIGNMENT: Democracy and Genetic Algorithms

INTRODUCTION

A fierce enemy of democracy, Socrates, the ancient Athenian philosopher has formulated a formidable attack on democracy as a system of government. As described by Plato, and loosely translated, Socrates asks:

“When you get sick do you go around the neighborhood asking for advice?”

“No”, they answer him, “you go to a special doctor”.

“How about when you must cross a difficult passage by sea, do you go around the market- place asking for advice on how to do it?”

“No, you go to a good captain who will do the job right.”

“Then,” asks Socrates after a few similar questions (with similar answers), “when we need advice about our country, on whose fate our own safety and happiness totally depend, why should we go around asking the opinion of every person, however unwise they may be? Shouldn’t we go to specialists in the art of politics and government?”

We leave aside issues such as how these specialists in the art of politics will be found. One would suggest we could train them the same way we train doctors; for example in – God forbid! – Harvard’s School of Government. First, let’s consider Protagoras’ answer to Socrates in the form of a myth involving the Gods of Olympus when they created mankind:

“Hermes asked Zeus how he should impart justice, reverence and political judgment among men: Should he distribute them as the various other skills are distributed; that is to say, to a favored few only -- for example, one skilled individual has talent in medicine or any other art, while the many are unskilled? ‘Shall this be the manner in which I am to distribute justice and reverence among men, or shall I give them to all?’ ‘To all,’ said Zeus; ‘I should like them all to have a share; for cities cannot exist if a few only share in these virtues.’

And this is the reason, Socrates, why the Athenians ... when they meet to deliberate about political virtue, which proceeds only by way of justice and wisdom, they are patient enough of any man who speaks of them.”

This is a myth, of course, (in fact, Protagoras first asked permission – and got it - to use a myth when he replied); Socrates could have ridiculed the answer as a mere myth – as he often did. He does not, though, because he sees its meaning quite well: For Protagoras and the friends of democracy, it is a belief that politics work better with democracy, considering that everyone contributes a part in finding a complex truth.

SCIENTIFIC RESEARCH: SOME SIMILARITIES TO POLITICS?

Consider also the following quotation:

“The investigation of truth is in one way hard and in another way easy. An indication of this is found in the fact that no one is able to attain the truth entirely, while on the other hand no one fails entirely, but everyone says something true about the nature of things, and by the union of all a considerable amount is amassed.” Aristotle, Metaphysics a. 1. 993a30-993b4.

This is the quote covering the entire façade of the building of the National Academy of Sciences, in Washington, DC.

ASSIGNMENT

Knowing about genetic algorithms and realizing how complex society’s problems are, let’s try to construct a more concrete defense for democracy. The purpose is to defend the notion that democracy works -- we should not get into issues of social justice, equality, etc, which are very important, but do not address the main criticism of Socrates.

It is reasonable to state that most problems faced by a country are very complex, certainly outsmarting in most cases all of the people. Explain how you envision the process of creating solutions through open exchange of ideas. In particular think how “gene-crossing” and “mutations” can be implemented in the political process. For ideas, consider at least some of the following questions – but always as they relate to the concepts of the genetic algorithms:

- What is a fundamental difference between a medical doctor administering advice to a patient, and conducting (original) medical research – think of Aristotle’s statement above. Can you extend this to politics?
- How can we avoid getting stuck on “local maxima”, and, instead, attain “global maxima”? How can we make sure, for example, that our solution will contain “far out” elements, that may be essential to reach non-obvious parametric spaces? Do we need to include people with extreme ideas in our discussion, for example?
- Within the same narrow viewpoint, what is the best way for idea-exchanging in politics?
- Genetic algorithms allow a wide variety of choices when considering how to select parents to “mate”. One must always balance the need to converge (by giving preference to the highest-rated “parents”), with the need to cover a wide parametric range (which requires to also allow low-rated “parents” to mate, as well as to mutate “genes”). Explain how this manifests itself in the political process.
- What is the role of political parties within this view of democracy? Do they enforce open idea exchange (“gene crossing”, “mutation”) or prevent it? Likewise, what is the role of the mass media?
- How do we judge representative democracy (congress/parliament) as practiced today, versus the direct democracy practiced by Athenians (decisions on all topics by all people)?

The subject is complex so you can choose to treat a very specific item, or address the overall theme.

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