LECTURE 8

ARTIFICIAL INTELLIGENCE - III

The first of the two class discussion is on the topic,

Can Machines Think?

and I again review why it is important to come to your own evaluation of what machines can and cannot do in your future. I pass out the following list of observations:

1. Just because computers have not yet been programmed to think does not mean that they cannot think; it may mean that programmers are stupid!

2. Just because you want to believe that machines can think does not mean that they can; it may only be wishful thinking!

3. Art Samuel's checker program "learned" from experience so machines can apparently learn from experience.

4. The new proof in the isosceles triangle theorem showed "originality" - perhaps as much as you have ever done!

5. Try to imagine the shortest, or close to the shortest, program that you believe could think. No sub piece could think by definition.

6. Remember "logical" and "psychological" novelty.

7. Whatever your opinion is, what evidence would you accept that you are wrong?

8. Thinking may be a matter of degree and not a yes/no thing.

9. Consider that thinking may be the way something is done rather than what is done that determines whether it occurs or not. AI has traditionally stuck to the "what is done" and seldom considered the "how it is done".

The class discussion begins with my observation that which ever position they adopt I will take the other side, and that I do not care what they believe so long as they have good reasons and can explain them clearly. That is my task, to make the students think on this awkward topic, and not to give them any answers.

Year after year the discussion is generally quite hostile to machines, though it is getting less so every year. They often

start with remarks such as, "I would not want to have my life depend on a machine." to which I reply, "You are opposed to using pacemakers to keep people alive?" Modern pilots cannot control their airplanes but must depend on machines to stabilize them. In the emergency ward of modern hospitals you are automatically connected to a computer which monitors your vital signs and under many circumstances will call a nurse long before any human could note and do anything. The plain fact is that your life is often controlled by machines and sometimes they are essential to your life - you just don't like to be reminded of it.

"I don't want machines to control my life." - you do not want stop and go lights at intersections! See above for some other answers. Often humans can cooperate with a machine far better than with other humans!

"Machines can never do things that humans can do". I observe that in return machines can do things that no human can do. And in any case, how sure are you for any clearly prespecified thing that machines (programs) apparently cannot now do and in time still could not do it better than humans can? (Perhaps "clearly specified" means that you can write a program!) And in any case how relevant are these supposed differences to your career?

The students are generally sure that they are more than a machine, but usually can give no real argument as to why there is a difference, unless they appeal to their religion, and with foreign students of very different faiths in the class room they are reluctant to do so - though obviously most (though not all) religions share the belief that man is different, in one way or another, from the rest of life on Earth.

Another level of objections to the use of computers is in the area of experts. The students are sure that the machine can never compete, ignoring all the advantages the machines have (see end of Lecture 1). These are: economics, speed, accuracy, reliability, rapidity of control, freedom from boredom, bandwidth in and out, ease of retraining, hostile environments, and personnel problems. They always seem to cling to their supposed superiority rather than try to find places where machines can improve matters! It is difficult to get the students to look at machines as a good thing to use whenever they will work; they keep their feelings that people are somehow superior in some area - and of course there are such areas, but at present they are seldom where the students first think they are. It is the combination of man-machine that is important, and not the supposed conflict that arises from their all too human egos.

The second class discussion is on the topic:

Future applications of computers to their area of expertise.

All too often they report on past and present applications, which is good, but not on the topic whose purpose is to sensitize them to future possibilities that they might exploit. It is hard to

get them to aggressively think about how things in their own area might be done differently. I have some times wondered whether I might be better off if I asked them to apply computers to other areas of application than their own narrow speciality; perhaps they would be less inhibited there!

Since the purpose, as stated above, is to get the students to think more carefully on the awkward topics of machines "thinking" and their vision of their personal future, you the reader should take your own opinions and try first to express them clearly, and then examine them with counter arguments, back and forth, until you are fairly clear as to what you believe and why you believe it. It is none of the teacher's business in this matter what you believe, but it is the teacher's business to get you to think and articulate your position clearly. For readers of the book I suggest that instead of reading the next pages you stop and discuss with yourself, or possibly friends, these nasty problems; the surer you are of one side the more you should probably argue the other side!