An Integrative Understanding of Artificial Intelligence

Artificial intelligence: Alexa, Google search and marketing, Self-driving cars, etc. etc. What could happen? And why? Should we be concerned? Should we be excited? Why? How should we steer it? Why? What algorithms are there? Why?

Nowadays there are a number of discourses related to artificial intelligence (AI), but which remain relatively isolated from each other and seldom inform each other. Five of them I have some experience of:

- The question "Computer = Human?"
- AI algorithms etc.
- Use of AI by individuals and organisations;
- AI and society
- Development of AI applications.

In this talk, I want to discuss a way of bringing some inegration among these discourses, which I believe to be informed and inspired by Christian or Biblical thinking.

1. The AI Question "Is Computer = Human?"

(Can be in principle, rather than is at present.)

1.1 The Debates

The debates (YES v NO) seem to be argued on three grounds, which transform the question:

- The Greek dualism of matter versus form: material versus mental or spiritual: brain versus mind. Examples: many. Question now is: "Can mental / spiritual arise from material?"
- The Scholastic dualism of nature versus supernature, secular versus sacred. Example 1: John Searle (physical versus biological causality). Question now is: "Do humans operate in a higher realm than computers do?" Example 2: 'Christian' view of humans being *Imago Dei*.
- The Humanist dualism of nature versus freedom, determinism versus freedom. Example: Allen Newell. Question now is: "Can freedom arise in physically determined systems?"

These three are three ground-motive of Western thought and the dualisms are presupposed. So the debates are never resolved.

New basis for debate: Dooyeweerd's notion of subjects and objects in multi-aspectual functioning.

1.2 A New Approach to the AI Question

"Is computer = human?" Question the "Is ="! What does "Is =" refer to?

What is being: of computer, of human, of God?

- Scholastic: Computer is nature; God and Imago Dei are supernature.
- Creational: Computers and humans are created; God is uncreated.

Dooyeweerd: "*Meaning* is the *being* of all that has been *created* and the nature even of our selfhood."

1.3 Spheres of Meaningfulness (Aspects) in Which all Functions

Aspect	Meaning	Me	Rel	Alexa
Quantitative	Amount	One person	S-S	One device
Spatial	Continuous extension	Near Alexa	S-S	Near me
Kinematic	Movement	(Speak) to Alexa	S-S	(Speaks) to me
Physical	Energy, etc.	Air vibrations Electrons in my nerve fluids	S-S	Air vibrations Electrons in conductors
Biotic / Organic	Life, organism	My ear-organ works	S-O	Device suited to human ear
Psychic / Sensitive	Sensing, response, feeling	I make and hear sounds	S-O	'Makes and hears' sounds
Analytical	Distinction	I form concepts, recognise or utter phonemes,	S-O	Recognises or utters phonemes, letters, words
Formative	Achieving, planning, structuring, etc.			
Lingual				
Social				
Economic				
Aesthetic				
Juridical				
Ethical				
Pistic / Faith				

3. Use of AI by individuals and organisations;

Challenge 1: Benefits and harm? How do we understand them, and cope with mixed benefit and harm, especially when indirect and unexpected impacts?

Challenge 2: Isolated discourses, e.g. HCI, versus information systems, versus games and virtual reality.

Model: AI use is three multi-aspectual human functionings:

- Engagement with interface and technology
- Engagement with meaningful content
- Engagement in life with AI.

Example: Understanding computer procrastination [Nick Breems]:

Each cell an aspect of an engagement; darker = more important.

4. AI and society

4.1 Impact of widespread use

4.2 Societal Infrastructure

2. AI algorithms etc.

Two main kinds:

- Knowledge representation
- Neural nets

Steps in machine learning: ("https://youtu.be/nKW8Ndu7Mjw")

- Collecting data
- Preparing data
- Choosing model (e.g. neural net)
- Training the model
- Evaluation
- Tweaking hyper-parameters
- Using.

All these require human decision. Tweaking is still an art, not a science.

2.2 AI Algorithms

- Knowledge representation ('expert systems': capture and express human knowledge by 'knowledge elicitation' so that computer can work according to it)
- Neural nets (trying to model brain functioning: trainable links between 'cells')

Problem of KR: Incomplete and tacit knowledge; the knowledge elicitation process is biased and . *Apparent* advantage of NN: automatically trains to tacit knooeldge. But NN highly dependent on human selection of input and output parameters, which can be even more incomplete and biased.

My approach: Awareness and understanding of the diversity of meaningfulness and laws of reality (Creation) in all its aspects can address some of this.

Example: To predict business failure, what kinds of information would you think relevant?

- Ahn (2000): Only financial indicators
- Boritz (1995): Only financial indicators
- Sangster (1995): Financial and ad-hoc 'qualitative' info

Using Dooyeweerdian aspects, can consider all kinds of info systematically.

5. Development of AI applications.

2.1 Aim of Developer or Researcher

What drives development of algorithms etc.?

- Desire for personal reputation?
- Desire for fulfilment?
- Love of problem-solving?
- Desire to understand and capture the way the world works, in each of its aspects?

Conclusion

There is an opportunity here for Christian thinkers to make a genuine contribution to artificial intelligence, in offering a basis on which to integrate the discourses in AI. To do so, we must rise above the Greek dualism of mind or spirit versus matter, rise above the Scholastic dualism of sacred versus secular, or ought versus is, rise above the Humanistic dualism of freedom versus determination, and focus instead on the diversity of meaning of reality (which we call Creation). I know of one Christian philosopher who can help us offer a basis for integration, Herman Dooyeweerd, whose ideas I have mentioned in passing. There may be others, but I have not yet found them.