Foundations of Skeptical Operating Systems, Using Non-Classical Suspension of a Logic Gate

By James L. Driessen[1]

This paper introduces new concepts in programming self-awareness. It particularly focuses on machine skepticism and why sentience might not be as you once thought. In today's quantum[2] world, first and foremost, we have to ask ourselves what it means to be self-aware. To reconcile ourselves as individuals separate from our environment, we should know what the environment is and what constitutes reality. Conceiving of reality requires observation – and observation, in turn, requires an observation medium – like light, sound, gamma rays, or x-rays, etc.

Time-space is a funny thing. If you speak, it takes time (a small amount of time) for the words to travel to the ear of the receiver. If you shine a laser light at the moon, it takes a while for it to reach the moon and bounce back. Yet, in a fully "real" sense, any observations beyond the light cone, or what we call the "Planck"[3] limitations of time and space, make no sense at all because the ability of information to transfer beyond those limits is lost.[4] And if "real" has limitations, the physical that we touch, see, hear or smell also has its limitations, lest we convince ourselves that we are the center of our universe.[5]

Second, we must comprehend more than just the meaning of life. We must also understand sentient life, or how reality truly makes us self aware. Some have suggested that sentience requires subjective experiences, or qualia.[6] Perhaps sentient life may even demand self-awareness.[7] Machine skepticism begs the question (and hopefully after considering this paper should inspire others to consider) whether the mysteries of sentient life may be different than those of artificial intelligence.[8]

Finally, sentience may also be a religious or theological dispute between determinism and indeterminism, because if God controls everything and knows all that has or will happen (right down to each and every choice we make) free will is called into question.[9] Self awareness may be a ruse. The Skeptic algorithm should be the key to uncovering the doctrine between destination and determinism.[10]

1. What is Real?

Understanding reality well enough to program self-awareness may require some help. How about considering theistic and deistic belief systems? Is there a God who programs our conceptions of time and space? Does God bestow upon us a certain soul or advantage over lower life forms that do not appear sentient to us? To answer such questions, we should look to causation, because origins of life need not be limited to the creation of things millions of years ago, but include the cause of every moment in time. Could I live in God's created simulation? Are the Akasha or *Akashic*[11] records playing on my cerebral cortex causing my sense of awareness? Or even more profound, is my cerebral cortex a part of this simulated creation?[12]

We already have programs that mimic created worlds. We use online role playing games ("RPGs") that mimic life situations. In an RPG, the ultimate destiny is set, but only the players control how to get there. Computer generated players may also have some power to control the destiny of the game. The RPG leads us to ask whether we might be the product of exactly the same thing we endeavor to create.

I am – the result of a Programmer's attempt to create biological sentience. Maybe, I live in a created world and this life and my experiences are a simulation. It may be quite the "grand" simulation, but a simulation none-the-less. If Programmers can create sentient programs like us, perhaps we in turn have the ability to create our own self aware agent simulations within our simulation.

2. Sentience = Belief = Choice (non-deterministic programmed hedge milieu)[13]

Machine skepticism should begin with a *causative approach*[14] by representing "belief" as the cause of choice. Belief may be that elusive and subjective quality[15] that identifies sentience.[16] Consistent with the Boolean[17] constructs, skepticism must have both a rational and irrational component because belief is not always rational. At times belief may not even adhere to Aristotle's classical logic paradigms of non-contradiction, excluded middle, or identity.[18] Of course, this presents some difficulty for computer programmers.[19]

3. Avoidance of the Theological Debate over Artificial Intelligence

Artificial intelligence (AI) dates as far back as early Greek mythology with mythical and animated objects. The Argo was a ship of the Argonauts which was a vessel possessed of speech because Athena fitted it with "speaking timber." Greek myths of Hephaestus and Pygmalion incorporated intelligent robots. Many intelligent artifacts have appeared numerous times since then in literature as fictional mechanical devices often behaving with intelligence. We may have that type of intelligence in common with a robot.[20]

The point is – we do not undo intelligence with skepticism; the goal of programming a self-aware machine is merely to allow a program to avoid or bypass logic when it needs to, but not in a random way – in other words, the program might be logical, but it must also be skeptical in all things. Defining when a machine needs to be skeptical might seem silly. What makes sentient beings different from other living organisms? Sentience can be very illogical.[21] But, even if sentient beings sometimes behave illogically, do we want our sentient machines to be stupid? [22]

a. The RPG

Comparing an RPG to this world (and to our lives) might be one of the most useful analogies to use in understanding machine skepticism. Perhaps the “Programmers” of this world, who framed the “game of life” wanted us to determine our own paths. If I do not determine my own direction, I have no free-will – or in essence, no self-awareness. Somehow the Gods (the Great Programmers) might have decided that absolute determinism was not a good thing. Likewise, we as programmers do not want determinism mucking up our sentient programs.

This realization of the incongruities between determinism and free-will (although often disputed) could prove to be a useful programming tool in programming the simulated simulation.[23] Understanding how to Program a simulation within a simulation might bring us

closer to "non-classical"[24] life logic. Certainly, the idea that all reality could possibly be nothing more than a simulation, could easily be considered a new (neo-classical) form of thought.[25]

Simulating skepticism within a simulated reality, therefore, becomes an operational construct.[26] Skepticism must not generate any independent fact or data; it should only organize or check data to form belief or doubt and serve as an operating system in the game of self awareness. The skepticism alternative to a decision tree should perform only parsing and pausing. The parse and immediate pause should occur whenever data (or input) is entered.

b. *The Self-deterministic Operating System*

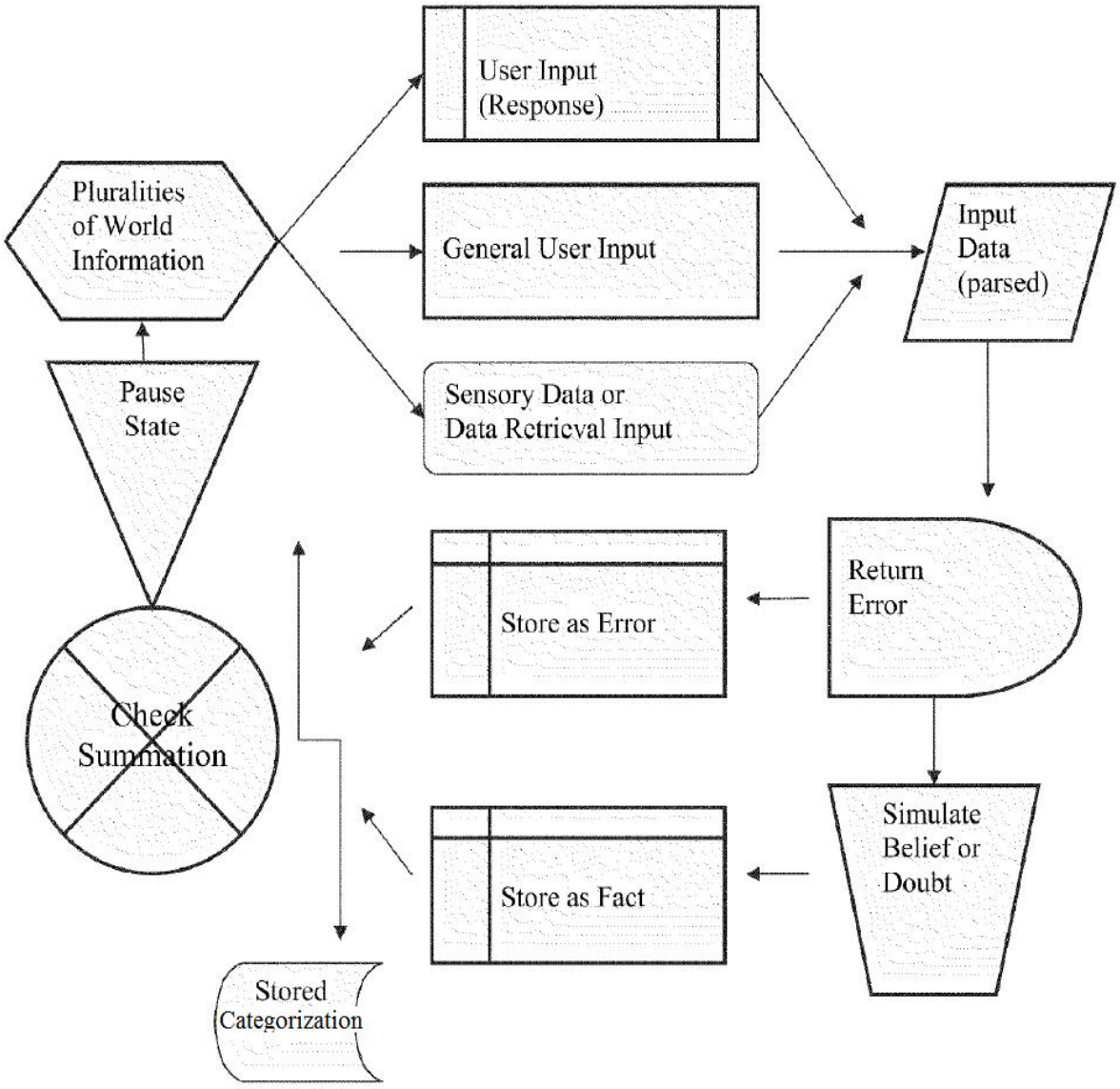
Skepticism should be based on constructs similar to an operating system crash. When an operating system crashes, it could be demonstrating one of the most fundamental exhibitions of free will.[27] Skepticism provides a natural simulation of human decision making because although the mind is capable of believing fact calculations, all facts in the mind are barred without belief.[28] Skepticism might tolerate other well known computational algorithms, but those algorithms are relegated to data input. The attached skeptic flow diagram and algorithm represent non-computational machine skepticism using a non-classical suspension of a logic gate.[29]

If intelligence can be defined as factual calculation, facts and probabilities are the ancillary (or input) to skepticism where operational choice is the core. Because belief and doubt are actually the same thing – just different levels on the same scale, irrefutable facts and "knowledge" are a fallacy. There is no fact which is completely 100% irrefutable. There is no falsity which has 0% chance of being true. Even if existential truth is real and this skepticism algorithm proves not to be the only correct algorithm; machine skepticism should be accounted as the most correct approach to programming free-will. Any skeptical algorithm, therefore,

should also defy Turing's halting problem[30] because when computational facts do not exist, the program is free to run and run forever. If you bypass the need for it, fact has no place. Skepticism is incapable of resolving to a fact.[31]

Conclusion

The definition of skepticism ("belief/doubt") becomes a paused state. When a system stops parsing data, a sort of crash occurs, and a belief hedge state may be accomplished. Accept this definition (a "paused state") because it will allow a binary belief or doubt (1 = believe and 0 = doubt) and the gradient becomes a cyclic redundancy check that pauses or terminates based on data classification (not on fact resolution or data storage).


User Input
(Response)
Pluralities
of World
Information
General User Input
Input
Data
(parsed)
Pause
State
Sensory Data or
Data Retrieval Input
Return
Error
Store as Error
Check
Summation
Simulate
Belief or
Doubt
Store as Fact
Stored
Categorization

The Belief Algorithm

<>

:start

Set belief =0

Set true=a

Set trust=b

Set false=c

Run input confidence

If confidence=null

Set confidence=1

:sample input	***input truth***	***input lies***	***input truth***
:ask	*First Iteration*	*Second Iteration*	*Third Iteration*
ask question	*answer=x*	*answer=z*	*answer=x*
if confidence=1	*confidence=1*	*confidence=0*	*x=trust*
set userinput=trust	*x=trust*	*z=trust*	
:act	*if x=a;x≠a*	*if z=x;z≠x*	***if x=x;x=x***
if trust=true goto entrue	*if x=c;x≠c*	*if z=c;z≠c*	*if x=z;x≠z*
if trust=false goto enlie	*if 0=1;0≠1*	*if 1=1;1=1*	*if 0=1;0≠1*
if belief=1 goto knowledge			
:enlie			
output 'I don't believe'		*I don't believe*	
goto reveal			
:entrue			
output 'I will trust'			*I will trust*
goto knowledge			
:guess			
output 'I see, 'trust''		*I see,x*	
:reveal			
run input belief		*belief=1*	*belief=0*
if belief=1		*x=true*	*false=z*
set trust=true		*x=trust*	
set 'true'=trust			
else			
set false=trust			
goto ask			
:knowledge		*I know x*	*I know x*
output 'I know 'true''		*continue*	*pause*
run input confidence			
pause/continue			
if confidence=1			
if confidence=0			
if belief=1			
goto guess			
else			
goto reveal </>			

[1] James L. Driessen, JD//MBA BSME. James brings years of experience in fast paced regulatory and technology driven environments. He is an Attorney, MBA, and engineer, practiced in the business arena, defending corporations or advocating consumer's rights. He has in-depth software and hardware knowledge in Linux, Solaris, Windows and Netware LAN environments. On January 17, 2012, James' method of building a skeptical logic algorithm has received a US patent, number 8,099,375.

[2] See Zarate, Oscar, *Introducing Quantum Theory: A Graphic Guide to Science's Most Puzzling Discovery*, Totem Books (2003) ISBN-13: 978-1840468502. Quantum mechanics could date back to the 19th century transmission of cathode rays by Michael Faraday, discovery of the black body radiation by Gustav Kirchhoff, and suggestion by Ludwig Boltzmann that energy states of physical systems can be discrete. In the early 20th century scientists like Max Planck formulated hypotheses that energy is both radiated and absorbed in discrete "quanta", or "energy elements" and in 1905 Albert Einstein interpreted Planck's quantum hypothesis realistically and used it to explain the photoelectric effect, in which shining light on certain materials can eject electrons from the material. The 1927 Solvay Conference in Brussels is often considered the pivotal event establishing the foundations of quantum mechanics by Niels Bohr, Werner Heisenberg, Max Planck, Louis de Broglie, Albert Einstein, Erwin Schrödinger, Max Born, John von Neumann, Paul Dirac, Wolfgang Pauli, David Hilbert, and others.

[3] "Planck Time". COSMOS - The SAO Encyclopedia of Astronomy. Swinburne University. One Planck time is the time it would take a photon travelling at the speed of light to cross a distance equal to one Planck length. Theoretically, this is the smallest time measurement that will ever be possible.

[4] Devoid of meaning or without the capability for comprehension. Compare, "Nihilism" Friedrich Nietzche, *The will to Power*, Vintage (1968) ISBN-10: 0394704371 ("As long as you still experience the stars as something above you, you still lack a viewpoint of knowledge.")

[5] Solipsism is the philosophical idea that only one's own mind, alone, is sure to exist.

[6] Schrödinger, Erwin "The Mystery of Sensual Qualities" Chpt 6 of Mind and Matter (1958), in What is Life? with Mind and Matter and Autobiographical Sketches Cambridge University Press, Canto Edition (1992) ISBN 0521427088 p. 154. ("The sensation of colour cannot be accounted for by the physicist's objective picture of light-waves. Could the physiologist account for it, if he had fuller knowledge than he has of the processes in the retina and the nervous processes set up by them in the optical nerve bundles and in the brain? I do not think so.")

[7] Rene Descartes, Discourse on Method (1637) (French "Je pense donc je suis" loosely translates to the Latin, "Cogito ergo sum" or English "I think, therefore I am")

[8] Sentient life may actually be quite a bit different than life in general. Colin McGinn, a British philosopher currently at the University of Miami, postulated that humans are incapable of defining sentience; that the mind is incapable of comprehending itself entirely, and that this incapacity has primarily occupied most of Western philosophy since Descartes.

[9] The argument from free will, also called the paradox of free will (or theological fatalism) contends that omniscience and free will are incompatible. Any conception of God that incorporates full knowledge of all things past present and future is inherently contradictory with free will. See Everett, Nicholas, *The Non-Existence of God*, Routledge, ISBN-10: 0415301076 (2003); See also, Martin, Michael, and Monnier, Ricki, The Improbability of God, Prometheus Books, ISBN-10: 1591023815 (May 2006); See also Barker, Dan, *The Freewill Argument for the Nonexistence of God*, Freethought Today, (August 1997) (http://ffrf.org/legacy/fttoday/1997/august97/barker.html) [Laplace's demon is a hypothetical "demon." It was posited in 1814 by Pierre-Simon Laplace. It goes like this: if that demon could know the precise location and momentum of every atom in the universe at any one instant, then it could use Newton's laws to reveal the entire course of all cosmic events of the past, present, and future.]

[10] Compare Compatibilism, e.g, Padua, David, *Encyclopedia of Parallel Computing*, Springer Science + Business Media (2011) ISBN 978-0-387-09765-7. ("Deterministic routing protocols provide a single path between every source-destination pair. Oblivious routing algorithms produce routes independent of the state of the network."). This paper argues between determinism and indeterminism, that somewhere lies a certain non-determinism (i.e. the simulated determinism) with a "higher power" sentient "God" who is a "Programmer" of our lives. Even if all roads lead to Rome, and if there are infinite roads, the path is still not determined.

[11] See, Laszlo, Ervin, *Science and the Akashic Field: An Integral Theory of Everything*, Inner Traditions; 2nd edition (May 14, 2007)

[12] See also Elvidge, Jim, author of *The Universe Solved*, Alternative Theories Press, (2007) ISBN 978-1-4243-3626-5 ("When you look into the nature of reality with an open mind, yet armed with the tools of math and hard science (such as quantum mechanics and cosmology), it is hard *not* to arrive at the conclusion that a programmatic mechanism is behind the workings of the universe. The evidence includes the discrete nature of reality, the

inevitable direction of virtual reality, the finely-tuned universe, and the fact that all known scientific and metaphysical anomalies are only explained by such a model.") quoted 02/27/12 http://theuniversesolved.com

[13] "Milieu" is the French word for environment – or the place in which something occurs. The place to look for in which skepticism occurs should focus on causation. In this presentation the Programmer suggests that it is best to represent belief as the cause of choice. We will begin by first equating belief with a choice, second it will explore machine skepticism as a form of artificial intelligence, and lastly will present a non-conventional algorithm that presents a form of non-deterministic programmed hedge instruction.

[14] Clarke, Randolph, *Incompatibilist (Nondeterministic) Theories of Free Will*, The Stanford Encyclopedia of Philosophy (Fall 2008 Edition), Edward N. Zalta (ed.), plato.stanford.edu/archives/fall2008/entries/incompatibilism-theories/. ("…a free decision is a causally complex event, consisting of the agent's causing her coming to have a certain intention … Such a causally complex event is, in turn, a component of any free overt action, such as one's freely raising one's arm.")

[15] Op.cit pg. 1 fnt. 4

[16] For example, machines can randomly generate numbers, but can they really "choose" numbers? When choice represents intention, a randomly generated response has no intention and is not volitional. Therefore, in order to achieve a volitional state, at least a basic belief should be established prior to forming choice.

[17] Boole, George, *An Investigation of the Laws of Thought,[1859, posthumously 1865] Prometheus Books.* (2003) ISBN 978-1-59102-089-9. (Traditional deductive reasoning, differs from inductive reasoning where facts are determined by repeated observations. Syllogism is presumed superseded by first-order predicate logic.

[18] Intelligence is a data component.

[19] Compare, Kowalski, Robert, *Predicate Logic as a Programming Language Memo 70*, Department of Artificial Intelligence, Edinburgh University. 1973. Also in Proceedings IFIP Congress, Stockholm, North Holland Publishing Co., 1974.

[20] e.g. Dennett, Daniel C., *Lecture on "Free Will" (Edinburgh University)*, Enlightenment Lecture Series, Edinburgh University, June 27, 2007.- as published on http://www.youtube.com/watch?v=aKLAbWFCh1E ("Some years ago, there was a lovely philosopher of science and journalist in Italy named Giulio Giorello, and he did an interview with me. And I don't know if he wrote it or not, but the headline in Corriere della Sera when it was published was "Sì, abbiamo un'anima. Ma è fatta di tanti piccoli robot – "Yes, we have a soul, but it's made of lots of tiny robots.")

[21] How do you use logic to program the illogical? For any two propositions "A is B" and "A is not B" the two are mutually exclusive, right? Consider the law of the excluded middle, where if one proposition is true, then its negation must be false.

[22] "Only two things are infinite, the universe and human stupidity, and I 'm not sure about the former." Albert Einstein, as adapted by Mayer, Jerry and Holms, John P., Bite sized Einstein, Quotations on Just about Everything form the Greatest Mind of the Twentieth Century, Random House, (1996) ISBN 0-517-22100-4

[23] Compare/contrast with the teachings of "stoicism," Zeno of Citium, c. 334 B.C – c. 262 BC., which limit the definition of free will to the "freedom to act." Modern philosophers like David Hume and Thomas Hobbes and contemporary compatibilists like cognitive scientist Daniel Dennett, *Consciousness Explained*, Back Bay Books, ISBN 0-316-18065-3 (1991) ("the conscious determination of one's actions") tend to also support this definition of free will.

[24] See London Philosophy Study Guide, University of London, (1993-last update 2005) (e.g. deductive and inductive reasoning; consistency and validity; syllogistic, propositional, predicate, modal)

[25] e.g. Bostrom, N. 2003, Faculty of Philosophy & Oxford Martin School Oxford University, *Are you living in a computer simulation?* Philosophical Quarterly 53:243-55. http://www.simulation-argument.com. (Skeptical hypotheses or Creation Hypothesis in philosophy suggest that reality is very different from what we think it is; or at least that we cannot prove it is not. Examples include: The "Brain in a vat" hypothesis supposing that one might be a disembodied brain kept alive in a vat, and fed false sensory signals, by a mad scientist; the "Dream argument" of Descartes and Zhuangzi supposings reality to be indistinguishable from a dream; the five minute hypothesis (or omphalos hypothesis or Last Thursdayism) suggests that the world was created recently together with records and traces indicating a greater age; the Matrix hypothesis or Simulated reality hypothesis suggest that we might be inside a computer simulation or virtual reality)

[26] Galvin, Peter B. and Gagne, Greg, *Operating System Concepts*, Wiley; 8 edition (July 29, 2008) ISBN-10: 0470128720 ("An operating system is a program that manages the computer hardware … A computer system can be divided roughly into four components: the hardware, the operating system, the application programs, and the users." There are two types of computability problems: decisional problems and functional problem.

[27] The “blue screen of death” or “stop message” "Demystifying the ‘Blue Screen of Death’". Microsoft TechNet. Microsoft Corporation. (In non-microsoft OS – “kernal panic” “fatal error” “post-mortem dump” “segmentation fault” “reboot requirement” “core dump” “bus error”)

[28] See The Oxford Companion to Philosophy, Ted Honderich, editor. (Oxford, 1995) ISBN 0-19-866132-0 (“A fact is, traditionally, the worldly correlate of a true proposition, a state of affairs whose obtaining makes that proposition true”) The usual test for a statement of fact is verifiability; that is whether it can be shown to correspond to experience. Fact may be considered in either epistemological or ontological terms. Questions of objectivity and truth are closely related.

[29] J.S. Bell’s Speakable and Unspeakable in Quantum Mechanics, stated “No physical theory of hidden variables can ever produce all of the predictions of quantum mechanics … [e]very quantum computing theory must violate either locality or counterfactual definiteness” Bell’s theorem is a “violation” theorem – opposite Laplace’s Demon. The beauty is that when a computer “violates” the “violation” we can achieve the non-virtual – or, in other words, the “simulated simulation” and it is merely a double negative that does not result in a positive. Thus, when a computer only parses error, but does not attempt to “correct error” the elusive “free will” or “uncertainty” computing is actually achieved.

[30] Alan Turing, *On computable numbers, with an application to the Entscheidungsproblem*, Proceedings of the London Mathematical Society, Series 2, 42 (1936), The halting problem can be described as deciding, given a program and an input, whether the program will eventually halt when run with that input, or will run forever.

[31] Op cit. pg. 3, ftn 18