Re: Penrose vs the Robot

Source: http://sci.tech−archive.net/Archive/sci.logic/2005−11/msg00661.html

- *From*: "Stephen Harris" <cyberguard1048−usenet@xxxxxxxxx>
- *Date*: Fri, 25 Nov 2005 17:54:59 GMT

"Rupert" <rupertmccallum@xxxxxxxxx> wrote in message
news:1132884982.182337.101260@xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
>
>> So, yes, it is like the liar paradox, except that it isn't a paradox.
>>
>
> The contradiction only appears at the level of Penrose's belief system,
> so it's not as startling. However, when Penrose reasons about this
> sentence, he almost certainly will get himself into contradictions. I
> think that's a good enough reason to call the sentence paradoxical.
>> −−
>> Daryl McCullough
>> Ithaca, NY
>

Recall that Penrose is making a claim about AI, which must use
a formal language (program) which is restricted from recognizing
all truths in a given formal system.

Penrose is claiming that he as a representative human, can divine
unassailable truths, which is of course equivalent to the claim that
he can perceive all mathematical truths.

The Penrose argument is true if you grant this premise because
the argument is circular. The problem is that it's not at all plausible
that any human belief system encompasses the truth or scope of
reality. However, because humans can't do it, and computers can't
do it, does not make them equivalent. If Penrose humans actually
thinks that some human mathematicians can discriminate all of any
category, unboundedly finite+, then that thinking is best not described
as paradoxical. This idea again returns to the inability to translate
abstractions into physical reality with a one−to−one correspondence.
The situation seems closer to the Sorites Paradox, in any event.
Distilling natural languages into a formal system produces a <subset.

Humans intuit truth/belief for a mathematical idea using the same
brain mechanism they use to play chess which is not the same way
computers do it (brute force) in complex positions; although both

methods may output the same move. How to generalize from the finite to the infinite does not seem to be a listable or computable property. This quote from "The Scientist" refers to John Myhill.

"Most logical systems have the property of being listable but not computable: all their theorems can be listed but there is no automatic procedure for inspecting a statement and deciding whether or not it is a theorem.

If the mathematical world had no Godel theorem, then every property of any system that contained arithmetic would be listable. We could write a definite program to carry out every activity. Without the restrictions of Turing and Church on computability, every property of the world would be computable.

Not every feature of the world is either listable or computable. For example, the property of being a true statement is neither listable nor computable. One can approximate the truth to greater and greater accuracy by introducing more and more rules of reasoning and adding further axiomatic assumptions, but it can never be captured by any finite set of rules. These attributes that have neither the property of listability nor that of computability−−the "prospective" features of the world−−are those that we cannot recognize or generate by a series or sequence of logical steps. They witness to the need for ingenuity and novelty; for they cannot be encompassed by any finite collection of rules or laws. Beauty, simplicity, truth; these are all properties that are prospective."

SH: Also see:
http://groups.google.com/group/sci.logic/msg/e47fa27c85ecc2a0?hl=en

www.math.wisc.edu/~alfeld/computnotes.pdf

"So a productive set is one which allows us to, given a c.e. subset, find an element in the set but outside the c.e. subset. A creative set is "effectively noncomputable". Namely if we think that C is computable then C^ should W\/ x for some x, but as C^ is productive and Wx is a proper subset of C^ we can find an element in C −− Wx so Wx can not be C. The "effectively" comes from that we know a counterexample, namely \\/(x), for any candidate x.

Any productive set has a one to one total computable productive function p. A set is creative if it's complement is productive."

>From MathWorld/Wolfram
"Productive sets are not recursively enumerable.
A recursively enumerable set A is creative if its complement is productive.
Creative sets are not recursive."

"A creative set is "effectively noncomputable".

"These attributes that have neither the property of listability

nor that of computability−−the "prospective" features of the world−−are those that we cannot recognize or generate by a series or sequence of logical steps. They witness to the need for ingenuity and novelty; for they cannot be encompassed by any finite collection of rules or laws."

"The property of creativeness coincides with completeness. Namely, set A is creative iff if it is many−one complete."

SH: Penrose is claiming/stipulating that a human mathematician can recognize a member of an "effectively noncomputable" set, that a computer obviously cannot, so therefore an AI which is a program written in a formal language which must be computable, cannot be the equivalent of a human mathematician reasoner. He is also claiming that there is a complete mapping of a mathematical result (Godel Inc.) unto physical reality, so that Godel Inc. can be used to justify a consequence impacting physical reality, existence or non−existence of a program using a formal system to completely emulate human thought potential. What is paradoxical in a way is that Godel Inc. used to propel his argument does not support such a complete mapping or description of the membership of its reality.

Therefore if the rules of physical reality are actually formalistic no such mapping as Penrose attempts is consistent/complete.

So Penrose is assuming when using his premise that there is no in principle mathematical truth unavailable to the mathematician. If physical reality works that way, then it is not isomorphic to a physical reality which in principle proscribes some human mathematical discovery or recognition of truth. Which is another way of saying his argument is circular.

If one assumes that the human mathematician does not have complete mastery of his/her province, then observing that a formalized program also does not, does not permit one to make conclusions about their properties in other areas.

Like snow is white and paper is white doesn't make them both wet or both foldable. A black dog and black car don't both bark just because you can put them into a larger category: capable of making noise.

Penrose's argument boils down to one about using an adjective, a description of a property, and attempting to generalize that to what a brain is (a non−computable mechanism he says) and what a computer is (a computable mechanism) = nouns, as if his arguments encompasses how two things behave decide what they are. A human can sing well but not play basketball well, does not mean that both aren't human underneath. As I see it, refuting

Penroses's argument refutes Computationalism, that
the observed output determines whether two things are
equivalent, not what is under the hood that produces
comparable (or not) behavior is what matters. This comes
up a good deal more in Searle's Chinese Room Argument.

http://www−formal.stanford.edu/jmc/towards/node14.html

"A recursive ordinal is a recursive ordering of the integers
that is a well−ordering in the sense that any subset of the
integers has a least member in the sense of the ordering.
Thus, we have a contest in trying to name the largest
recursive ordinal. Here we seem to be stuck, because the
limit of the recursive ordinals is not recursive."

If wishes were horses then beggars would ride,
Stephen

.

- ***References***:
  - ♦ ***Penrose vs the Robot***
    - ◊ *From:* Daryl McCullough
  - ♦ ***Re: Penrose vs the Robot***
    - ◊ *From:* Rupert
  - ♦ ***Re: Penrose vs the Robot***
    - ◊ *From:* Daryl McCullough
  - ♦ ***Re: Penrose vs the Robot***
    - ◊ *From:* Rupert

- Prev by Date: ***Re: Help with a problem***
- Next by Date: ***UCLA Logic Colloquium, Dec 2***
- Previous by thread: ***Re: Penrose vs the Robot***
- Next by thread: ***Re: Penrose vs the Robot***
- Index(es):
  - ♦ ***Date***
  - ♦ ***Thread***