

Variegated Common Sense Versus the Science of Universal Intelligence, When the Aliens Arrive

(extended abstract)

Selmer Bringsjord

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Selmer.Bringsjord@gmail.com

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Aliens have arrived on Earth. Two of them, of exceedingly strange appearance (floating, glowing orbs of bright light; nothing more) have emerged from a glistening, spherical spaceship whose only marking is "CTC3" and, hovering about six feet above the ground, speak this aloud to the UN Secretary General and five scientific advisors standing with him in New York City, in crisp English:

"We come in peace to quickly solve your biggest problems (silly wars and use of silly power sources being two of them), and then loop back home before going to yet another primitive planet in need of assistance. We are on a very tight schedule so as to hit three black holes in correct sequence. As an indicator of our coming handiwork, here" — a small book is handed over, along with a datastick — "is the cure for all forms of what you refer to as 'cancer.' The material also includes the number that is the Σ function applied to input 7, with an accompanying proof of correctness in the system your computational logicians know as 'Athena.' Now, so that we can serve you rapidly, please immediately grant us access to every corner of your world, including its cyber dimension. Our renovation should take at most one of your hours, after which we'll be on our way. We await your rapid response, within one hour max. At the expiration of that period, if you decline, we shall depart immediately, leaving you to your own (primitive) devices. We are of course aware that you have hand-picked the quintet standing with you, so in the interests of efficiency and cleanliness, the one hour of deliberation should be confined to you and them, here, on the spot, in this very room, which is large enough for some side-meetings as needed. Of course, use of your little Internet during deliberation is permissible. The countdown starts ... now."

The science of universal intelligence (SUI) is a field that has arisen in the 21st century out of AI and — especially — AGI. It is concerned with theories providing a rigorous definition of and measurement scheme for intelligence in agents short of, at, and beyond the human level. These agents can be natural or artificial, or a mixture thereof. One such theory, from Marcus Hutter (2005) and Shane Legg (&

Hutter) (2007), is their theory *universal intelligence*; it's a purely numerical/statistical affair based on machine learning (and harkens back to AI founder and "56er" Ray Solomonoff). Formal logics and *a fortiori* reasoning based upon formal logics are here eschewed. Hutter & Legg signed a contract last week to advise the UN regarding an approaching alien spaceship, and its pre-arrival message, sent a week ago, which was: "We are in a bit of a hurry on our present loop and will not have time for sustained discussion of the proposal we shall issue upon arrival. Please have a group of at most six humans to greet us and rapidly render a verdict soon after our arrival and the issuing of our proposal. Obviously one of the six should be your UN Secretary General." Two of the six humans now standing before the pair of aliens are of course Hutter and Legg (H&L); they are assumed to be in intellectual lockstep.

Now to the remaining three advisors on scene. All three are in the camp I label "common-sensism." Two of these thinkers are Ron Brachman and Hector Levesque (B&L); they, like H&L, are in intellectual lockstep. B&L can trace their lineage back to the logic-oriented 56ers, including John McCarthy (who sustained this orientation throughout his career), Herbert Simon, and Allen Newell. B&L authored the recent monograph *Machines Like Us* (2022), in which can be found a theory of common-sense reasoning at the human level, right down to some determinate positions on the technical notion of this reasoning, especially in the final chapter of their book, entitled "The Logic of Common Sense." I call that logic **LCS**. Whatever advice B&L give the Secretary General on behalf of humanity must by hypothesis conform to **LCS**. As we shall see, this logic is quite precise, interesting, and reflects the empirically discovered (in cognitive science) inability of the vast majority of humans to reason well — but **LCS** is also inexpressive, and inferentially humble.

The last advisor is me. I stand alone physically, but not intellectually: my colleague is the late Roderick Chisholm. [Of course, my being here in NYC is rather self-congratulatory; but after all, I conceived and wrote the present parable, and will, for weal or woe, bring it to mature closure, in the exercise of my literary liberty. Liberties taken extend to my interpretation of Chisholmian work, but I'm in part guided in that regard by Taliaferro (1988).]

Chisholm is one of, if not the, greatest male analytic philosophers of the prior century, and is suitably labeled the "common sense" philosopher by more than a few. Common sense for Chisholm is a declarative-and-inferential (a tandem that includes as a fragment extensional second-order multi-sorted logic), and non-numerical affair; machine learning and related formalisms are worthless. A Chisholm scholar, assume, had also signed a contract last week to advise the UN regarding the approaching aliens, after being supplied with the pre-arrival message. Of course, that scholar is, yes, yours truly. I have taken the liberty of adapting Chisholm's view so as to include its reach across the resources of 21st-

century computational logics and logicist AI. The Chisholm-Bringsjord theory of intelligence is called *universal common-sense intelligence* (UCSI), and draws in certain ways from *universal cognitive intelligence* (Bringsjord et al. 2023), which in turn draws from the measurement scheme Λ , introduced by Bringsjord & Govindarajulu (2020).

The UN Secretary would very much like within 45 minutes a recommendation from H&L, B&L, and B&C. He will review, and then issue a verdict to the aliens.

I show that (i) H&L, when assumed to be drawing from their theory UI, will be well nigh useless to the Secretary, and humanity (ditto for any and all advice based on deep learning+reinforcement learning in the form of "foundation models"); (ii) B&L, under the same only-your-own-theory constraint, will fare much better but ultimately fail to sufficiently help — yet are certainly on the right track, just hampered by a very "low-brow" conception of what common-sense in *Homo sapiens sapiens* is; and (iii) C&B will be able to make considerable headway, and issue a reasoned recommendation, by drawing directly on their account of UCSI. (The B in C&B by the way has something going for him outside of academic research: He knows all the original *Twilight Zone* & *Star Trek* episodes.)

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