Inflating the simulation argument

by Sven Nilsen 2016

The simulation argument from Nick Bostrom 2003 states that:

1. "The fraction of human-level civilizations that reach a posthuman stage (that is, one capable of running high-fidelity ancestor simulations) is very close to zero", or
2. "The fraction of posthuman civilizations that are interested in running ancestor-simulations is very close to zero", or
3. "The fraction of all people with our kind of experiences that are living in a simulation is very close to one"

This trilemma is based on the assumption that at some point in time, the fraction of new human-level civilizations is close to zero or existing inside a simulation, which is not necessarily true.

If cosmic inflation is true, there is a high probability that the inflation process never stopped expanding space and creates new matter, resulting in a large fraction of new human-level civilizations, an ever growing exponential process. At any given point in time, the fraction of human-level civilizations that reach a posthuman stage is very low compared to the fraction of new human-level civilizations, which sounds like 1) but means strictly a different thing:

1. "For each human-level civilization there could be a probability close to one that it reaches a posthuman stage", and
2. "The time it takes to go from a human-level civilization to a posthuman stage might take several hundred years on average", and
3. "During the time it takes to reach posthuman stage, the fraction of new human-level civilizations created by cosmic inflation and then billions of years of evolution, but not yet reached posthuman stage, would be growing exponentially, at least doubling every 10^{-33} seconds and thereby making the fraction of posthuman civilizations at every moment of time very close to zero"

The fraction of new human-level civilizations at least doubles every 10^{-33} seconds, because that is the time it took for cosmic inflation to create the observable universe. If cosmic inflation continues outside the observable universe, a similar starting condition will result in a volume comparable to the observable universe every 10^{-33} seconds. It is likely that a large volume has a similar starting condition, so assuming that it doubles is a very conservative assumption.

Since the density of human-level civilizations remains constant under similar physical laws to our universe, the amount of human-level civilizations grows with the volume of the universe. Even after billions of years of evolution, the pace that cosmic inflation grows the volume of the total universe could remain exponential. However large number of human-level civilizations there could be, it would soon become a tiny fraction of the total human-level civilizations a few seconds later.

The exponential rate of computing capacity for any human-level civilization will likely never outrun the exponential rate of cosmic inflation. Therefore, despite a high probability of reaching a posthuman stage, and a high probability of running ancestor simulations, the fraction of all people with our kind of experiences that are living in a simulation is very close to zero.

Nick, your simulation argument is unsound.