How To Live In A Simulation*

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How To Live In A Simulation[*]

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If you might be living in a simulation then all else equal you should care less about others, live more for today, make your world look more likely to become rich, expect to and try more to participate in pivotal events, be more entertaining and praiseworthy, and keep the famous people around you happier and more interested in you.

People love to pretend, and to watch others pretending. From story–telling to plays to movies to virtual reality, we keep getting better at making people feel like they are watching imagined places and events. We also keep getting better at role–playing, i.e., creating environments where several people can see what happens when they all pretend they are different people in another time and place. Eventually such role–playing simulations may get so good that people will often forget that it is just a simulation.

This brings us to the intriguing premise of many recent movies, including *The Matrix, 13th Floor, Truman Show*, and *Dark City*: what if people in the future create role–playing simulations where the people in it do not know that it is a simulation? This premise naturally leads to a premise even more thought–provoking: future people might create simulations of a world much like our world. If so, how sure can each of us now be that we are not now living in such a role–playing simulation?

A related scenario is the *holodeck* of the television show *Star Trek Next Generation*. The holodeck offers computer–generated environments that allow real people to role–play not only with each other, but also with sophisticated computer–simulated people. Today, computer–simulated humans contain only a pale shadow of the complexity and sophistication of real humans. But eventually, if we continue to make better simulations at lower cost, at least some of our simulated humans may be as sophisticated as real humans. In a holodeck, a simulated person might not realize that they were simulated. So the question arises: how sure can we each be that we are not a simulated person in a future holodeck simulation?

Obviously we cannot now be sure that we are not living in a simulation. The more likely our descendants are to be rich, long–lasting, and interested in simulating us, the more simulations of people like us we should expect there to be on average, relative to real people like us. And so the more we expect our descendants to be rich like this, the more we should expect that we are in fact living in a simulation [Bostom 2001].

Now if we, like those characters in recent movies, discovered specific clues in the world around us suggesting that we do in fact live in a simulation, we would of course consider those clues carefully to see what they say about how we should live our lives. But in the absence of such specific clues, many observers have assumed that no implications follow from the mere possibility that we might live in a simulation.

This is not quite right, however. In general, your decisions should be based on a weighted average over the different possible worlds you might live in. If you assign a non–zero subjective probability to the possibility that your descendants will create sophisticated simulations which include people (real or simulated) like us, ignorant of their status, then you should assign a non–zero subjective probability to the possibility that you now live in such a simulation. So to the extent that there are consequences of your actions which are different in a simulated world, and you care about these consequences, a non–zero probability of simulation should influence your decisions. The higher the probability you live in a simulation, the more influence that possibility should have on your decision.

Let us therefore consider in more detail how your decisions should be influenced by realizing that you might live in a simulation. To do this we will need to say what we mean by "should", and we will need some way to estimate what sorts of simulations we might live in, if we live in a simulation.

In this paper we will take "should" to simply mean satisfying the usual sort of human preferences. These include wanting to live longer and avoid pain, wanting this to be true of other people, wanting to be thought well of, and wanting to have influence. To guess at the kinds of historical simulations our descendants may create, we will primarily reason by analogy from the kinds of simulations people now like to create, and their reasons for creating them. The future mixture of simulation types and reasons will of course diverge from today's mixture in ways that we do not anticipate. But this approach at least gives us a rough guide to action.

We expect our descendants to run historical simulations for several different kinds of reasons. First, some historical simulations will be run for academic or intellectual interest, in order to learn more about what actually happened in the past, or about how history would have changed if conditions had changed. Other historical simulations, however, perhaps the vast majority, will be created for their story–telling and entertainment value. For example, someone might ask their "holodeck" to let them play a famous movie actor at a party at the turn of the millennium.

If every simulation is an exact faithful reproduction of all of human history, including the indefinite future, the only decision implications are for those who care about influencing "real" history, or care about being thought of well by "real" people. People who care about these things should realize that such influence is harder than it seems. After all, if this is a simulation, the only way to influence the real world is to somehow influence whoever is observing this simulation.

Simulating events in full detail can be enormously costly, however. Therefore most computer simulations today vary the detail at which they simulate various events. For example, a vibrating airplane wing is usually simulated in finer detail at places where it bends more, or where air currents near it change more. In general, the level of detail appropriate for any one place depends on how much more expensive it is to produce such detail, and on how influential larger errors are in producing errors in the final results of interest. Since it is harder to vary the simulation detail in role–playing simulations containing real people, these simulations tend to have some boundaries in space and time at which the simulation ends.

The possibility that we living in a limited simulation with varying detail offers many more implications for how we should live our lives. Consider, for example, a computer simulation of a party at the turn of the millennium created to allow a particular future guest to participate. This simulation might be planned to last only one night, and at the start be limited to the people in the party building, and perhaps a few people visible from that building. If the future guest decided to leave the party and wander the city, the simulated people at the party might be erased, to be replaced by simulated people that populate the street where the partygoer walks.

If you knew that you were a simulated person in this party simulation, and you wanted to live as long as possible, you might want to discourage anyone from leaving the party. If the simulation might end early were the future guest to become bored, you might also want to make sure everyone had a good time. And your motivation to save for retirement, or to help the poor in Ethiopia, might be muted by realizing that in your simulation, you will never retire and there is no Ethiopia.

Of course you know nothing as specific as that you are in a millennial party simulation for the benefit of the short guy in the red hair. But to the extent that, on average, the implications of the other possible simulations tend to push your decisions in the same direction, you can draw decision implications from the possibility that you live in a simulation.

For example, if not many simulations last through all of human history, then the chance that your world will end soon is higher than it would be if you were not living in a simulation. So all else equal you should care less about the future of yourself and of humanity, and live more for today. This remains true even if you are highly uncertain of exactly how long the typical simulation lasts.

Also, in general the behavior of many people far from the simulated people of interest might be randomly generated based on statistics from previous simulations, or come from "cached" records of previous simulated

people. Some "people" in a crowd simulation might even be run by very simple programs that have them wiggle and mumble "peas and carrots" like extras supposedly did once in movie crowd scenes. Assuming you don't care as much about these fake simulated people, then all–else equal you shouldn't care as much about how your actions affect the rest of the world.

If simulations tend to be ended when enough people in them become confident enough that they live in a simulation, then if you want to live long, you might want to prevent too many others learning that they live in a simulation. However, assuming the actual history of our descendants included many people who said it was likely that they were living in a simulation, then it should be all right if a similar number of people in a simulated world say this. It might even be a problem if too few people said this.

More generally, if our descendants tend to be more likely to simulate a world the more similar that world is to the actual world of their recorded history, then if you want your world to continue, all else equal, you want it to look more like what their history recorded. And since their history eventually resulted in very rich and powerful descendants, all else equal you want the world you live in to look like that will happen.

If our descendants tend to be more interested in simulating "pivotal" people and events from their history, then you should raise your estimate of the chances that the events and people around you will be considered pivotal to your descendants. You should also try to encourage this to happen, as it will make the simulators less likely to drop you from their simulation, or to end that simulation. If you can identify an especially interesting event around you, you might also try to prevent it from ending, as the simulation might end soon after the event does.

If our descendants prefer their simulations to be entertaining, all else equal, then you should want you and the events around you to be entertaining as well, all else equal. "All the world's a stage, and the people merely players." Of course what is regarded as entertaining does vary somewhat across time and cultures, and our distant descendants' tastes will likely vary from ours as well. So one should emphasize widely shared features of entertaining stories. Be funny, outrageous, violent, sexy, strange, pathetic, heroic, ... in a word "dramatic." Being a martyr might even be a good thing for you, if that makes your story so compelling that other descendants will also want to simulation you.

If our descendants sometimes play parts in their simulations, if they are more likely to play more famous people, and if they tend to end simulations when they are not enjoying themselves, then you should take care to keep famous people happy, or at least interested. And if they are more likely to keep in their simulation the people they find more interesting, then you should try to stay personally interesting to the famous people around you.

If our descendants like to play a moral God with their simulations, punishing and rewarding people in the simulation based on how they lived their lives, you might do well to live what they will consider praiseworthy lives. Of course you'll have to figure out the common features of morality in descendants who are willing to play God. (It would seem inconsistent of them to greatly emphasize humility, for example. Inconsistency and morality are hardly strangers though.)

In sum, if your descendants might make simulations of lives like yours, then you might be living in a simulation. And while you probably cannot learn much detail about the specific reasons for and nature of the simulation you live in, you can draw general conclusions by making analogies to the types and reasons of simulations today. If you might be living in a simulation then all else equal it seems that you should care less about others, live more for today, make your world look likely to become eventually rich, expect to and try to participate in pivotal events, be entertaining and praiseworthy, and keep the famous people around you happy and interested in you.

Reference

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Nick Bostrom, "Are You Living In A Simulation?" http://www.simulation−argument.com, March 2001.

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