

The Principle of Anthropic Universality

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The Principle of Anthropic Universality is a criteria that proofs in anthropic logic must satisfy to hold universally. It says that time-slices are quantified over, similar to propositions in propositional logic, for which all values the proof must return `true` in order to hold.

Generally, it is very hard to prove things in anthropic logic for reality, since the size of the universe and the number of observers similar to oneself are unknown and perhaps not completely definable.

The weakest assumption one can make about anthropic logic, is that if something is true for all times, and there exists at least one time, then it is true for any time.

If you examine the assumption above, one can see it is a special case of a more general tautology:

$$\forall p \{ \forall x : (\exists \emptyset) \wedge S \{ p(x) \} \Rightarrow \forall x : S \{ p(x) \} \}$$

This is a statement in second-order logic, which says that for all predicates, if it holds for all members of a non-empty set `S`, then the predicate holds for any member of the set `S`.

In anthropic logic, we wish to say true things for the moment we live, or for some future or past moment. One must assume that the moment we are talking about, is part of all observer moments in the universe. Otherwise, there would be no reason to believe that statements about all observers moments in the universe could be translated into statements about the moment.

For example, if most observers find themselves living on a planet for any time-slice, then it is likely that we are finding ourselves living on a planet.

On the other hand, if most observers find themselves living on a planet for most time-slices, but not always, then it might not be likely that we are finding ourselves living on a planet. It would be likely if the time-slice was selected randomly, but it does not hold universally. At some time, most observers are unlikely to find themselves living on a planet.

This principle distinguishes proofs that holds universally in anthropic logic from weaker proofs, such as selecting a random time-slice.