

## Re: My claim on Omega's defn

**Source:** <http://sci.tech-archive.net/Archive/sci.math/2005-01/8882.html>

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**From:** |-/erc (H\_at\_r.c)

**Date:** 01/31/05

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> >

> >>|-/erc wrote:

> >>

> >>>Omega = sum( p halts) 1 / (2 ^ size(p))

> >>>

> >>> [big snip]

> >>>

> >>>Even with infinitesimally small total probability of halting, Omega will not converge and will equal oo.

> >>

> >>

> >>You seem to be missing the point that the domain of the universal

> >>self-delimiting TM U is taken to be prefix-free --- ie, the encoding of

> >>halting TMs is such that if x is the encoding of some halting TM, then

> >>no proper prefix of x is a encoding. Basically, any branch of the

> >>infinite-binary tree will contain at most one such encoding, and so to

> >>simply say that there are 2^n encoding with n bits is just being

> >>ignorant. It follows via Kraft's inequality that Chaitin's Omega will

> >>be bounded.

> >

> >

> > So all Omega means is there exists 1 program of that size that halts.

>

> No, what it does mean is that the set of encodings of programs is sparse

> (quite possibly meagre) is the space of all finite binary strings. It

> is a perhaps unnatural condition, but its what was done to ensure that

> the "Omega series" converges.

>

> > What a load of crap, I could design an arbitrary UTM where Omega = 1.

> >

> > It skips 100% of programs without any reason.

>

> Then this number really doesn't mean anything. We could all come up

> with our own numerical constants, but unless there's a reason for them,

> no-one will care. It's the natural interpretation that Chaitin was able

> to get that makes it extremely worthwhile.

>

sci.math: Re: My claim on Omega's defn

the number of programs per size must