

## Re: Characterizing complexity

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**Date:** 07/30/04

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"Guy Hoelzer" <[hoelzer@unr.edu](mailto:hoelzer@unr.edu)> wrote in message news:cebkl1a\$10tu\$1@darwin.ediacara.org...

> in article ceb6ck\$s4t\$1@darwin.ediacara.org, Infinity Squared at

> infinitysquared@gmail.com wrote on 7/29/04 8:50 AM:

>

>> I note that another viewpoint has appeared in the recent

>> biological literature.

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>> This is work by Allan Orr, where he has treated the number of

>> phenotypic characters that describe an organism as a measure

>> of its intrinsic complexity.

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>> This work follows on from RA Fisher's "geometrical" model,

>> where he computed the proportion of beneficial mutations

>> of organisms with a number of phenotypic characters.

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>> A question that remains open is how many independent characters

>> are needed to describe an organism.

>>

> I disagree with this last sentence. What we choose to call "characters",

> like "traits", are hopelessly entangled with our views and interpretations.

> Parsing the bits of an organism in an information theoretic sense, as

> suggested here, is relatively objective, but such methods are also only

> loosely tied to the functional subdivision of the organism. This approach

> also ignores the essential functional hierarchy of parts that constitute the

> organism. I am not arguing that there is nothing to gain from taking this

> approach at this early stage of trying to get a quantitative handle on

> something like organismal complexity, but we should recognize its

> substantial flaws and limitations and keep an eye on where all this should

> eventually lead. Ultimately, we must aim to quantify the complexity of the

> organisms functional design. The rest is just a meaningless distraction

> (IMHO).

Hmmm. You seem to be suggesting that it is important to

distinguish functional complexity from structural complexity.

And claiming that it is the functional complexity measure that is

the significant one.

That may be, but it suggests a conjecture: Any apparent structural complexity which does not support functional complexity, can be found (on detailed study) to not really be very complex after all, in Kolmogorov's sense. Such pointless apparent structural complexity probably has a very simple causal explanation. As an example, I might point to human fingerprints or to the leopard's spots.

It suggests a second conjecture as well: Functional complexity resists compression. Functional complexity never has a simple causal explanation (at least in terms of efficient causality).

I don't know whether these conjectures are true, but they seem plausible to me.