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**From:** jeffrey E. <jeevacation@gmail.com>  
**Sent:** Monday, March 6, 2017 10:55 PM  
**To:** Joscha Bach  
**Subject:** Re:

it was a class of virus , is more like a mknd than t=e creativity of a neuron

On Mon, Mar 6, 2017 at 6:52 PM, Joscha Bach <[REDACTED]> <[REDACTED]> > wrote:

Octopi have a reputatio= for extreme creativity, i.e. they can observe things in their environment= simulate them mentally in several ways, come up with a solution and then =nact it.

Virus intelligence is an emergent thing, over many viru=es. The individual virus either succeeds or fails. A virus is like a thoug=t, not like a mind.

Am Mar 6, 2017 um 5:50 PM schrieb jeffrey E. <jeevacation@gmail.com  
<mailto:je=vacation@gmail.com> >:

=br class="m\_222983472287534534Apple-interchange-newline">  
watch the octopus, find its prey, is it creative=? is it intelligent? are virus creatvie? ◆=A0 finding  
new methods to infect the host. . hackers ◆=A0

On =on, Mar 6, 2017 at 6:47 PM, Joscha Bach <[REDACTED]>= wrote:

It seems that much of what we call intelligence could be de=cribed as detecting causal structure in a domain. Causality means that you=have a model that tells you how change of a condition will influence the d=stribution of outcomes. Of course, crabs do that too, to an extent.

<=iv>

When I was in Munich, a patent lawyer challenged me to come u= with a definition of creativity from a machine learning perspective. He h=s to judge the originality of inventions, and something that a domain expe=t can come up with "naturally" does not count as an invent=on, even if it has never been done before.

Learning sys=ems tend to move along gradients, and the "natural solution◆=9D of the domain expert can be seen as an extrapolation of the solution sp=ce along the known gradients, until an optimum is found. Creativity seems =o involve crossing discontinuities in the problem space, i.e. do more than=follow the gradients. It is not magic, of course; you can use evolutionary=methods/Monte Carlo etc., but you find that many domain experts are capabl= without being creative.

Can we measure the=ability of different animals for creativity?

=div>

Am Mar 6, 2017 um 3:23 PM schrieb jeffrey E. <jeevacation@gmail.com>  
<mailto:jeevacation@gmail.com> >:

i see it as a complex system agents are building many things. dependent on the local condition. some take off as useful in other parts of the system, monkeys using tools? I think the term intelligence is too vague. . a crab using a lure to catch its prey. =C2 is a bio inspired prosthetic. it arguably evolved. but cant be sure.

On Mon, Mar 6, 2017 at 3:44 PM, Joscha Bach <[REDACTED]>  
<[REDACTED]> > wrote:

So you don't think that practical intelligence is the ability to build arbitrary prosthetics?

I agree that humans share an important similarity with cells, i.e. they have mechanisms that suppress individual competition when it conflicts too much with group selection. Without such mechanisms, group selection fails, because within each group, defectors have a local advantage.

The simplest mechanism to enforce cooperation is reputation, but it works only when others are looking, and manage to keep tallies. To do better than that, evolution has to breed a virtual next level regulator into the individual, which may be your missing "top down for humans". A system of norms and taboos, for instance a religion or ideology that people pick up from their environment.

Individuals can decide, but in social contexts, the utility of decisions is given by how well we understand the constraints under which we operate.

Am Mar 6, 2017 um 10:50 AM schrieb jeffrey E. <[REDACTED]>  
Exactly! Sensors like that are often one of these solutions that get you 80% of the way with 20% of the effort. Except that minds that take 15 years to train are dramatically more expensive than almost no species can afford them (but they end up getting you to the moon, which no prosthesis can).

Am Mar 6, 2017 um 7:08 AM schrieb jeffrey E. <jeevacation@gmail.com> >:  
they may have physical prosthetics like cat whiskers. =C2 to enable it to gauge width of hole.

On Sun, Mar 5, 2017 at 8:03 PM, Joscha Bach <[REDACTED]>  
<mailto:joscha.bach@gmail.com> > wrote: <[REDACTED]>

Most animals don't have a self model, probably because they don't have complex enough brains or long enough raining phases (childhoods) to do meta-regulation.

> On Mar 5, 2017, at 16:48, jeffrey E. <jeevacation@gmail.com>  
 <mailto:jeevacation@gmail.com> > wrote:  
 >  
 > Law of large numbers is all that is needed  
 > On Sun, Mar 5, 2017 at 5:46 PM Joscha Bach <[REDACTED]>  
 <mailto:joscha.bach@gmail.com> > wrote:  
 >  
 > I am not sure how to relate that to game theory; you may be able to get that  
 without evolutionary competition. However, game theory is probably the way to explain how we evolve submission to  
 norms beyond indirect reciprocity.  
 >  
 >  
 > > On Mar 5, 2017, at 12:12, jeffrey E. <jeevacation@gmail.com>  
 <mailto:jeevacation@gmail.com> > wrote:  
 > >  
 > > i wonder in game theory what advantage it gives. .  
 > > On Sun, Mar 5, 2017 at 12:11 PM, Joscha Bach <[REDACTED]>  
 wrote:  
 > > absolutely. so are truth and meaning  
 > >  
 > > Am 05.03.2017 um 11:52 schrieb jeffrey E. <jeevacation@gmail.com>  
 <mailto:jeevacation@gmail.com> >:  
 > >  
 > > i is a mental construct that gives an evolutionary advantage , .  
 > >  
 > > On Sun, Mar 5, 2017 at 11:29 AM, Joscha Bach <[REDACTED]>=  
 wrote:  
 > > > I believe that I think, but am "I" the agent of thinking?  
 > > >  
 > > >  
 > > >  
 > > >  
 > > >  
 > > >  
 > > > On Mar 5, 2017, at 08:34, jeffrey E. <jeevacation@gmail.com> wrote:  
 > > > >  
 > > > I suggest the expression really should be "I think, therefore I believe I  
 am "  
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