

**From:** Joscha Bach <[REDACTED]>  
**To:** Reid Hoffman <[REDACTED]>  
**Cc:** Jeffrey Epstein <jeevacation@gmail.com>, Joi Ito <[REDACTED]>  
**Subject:** Re: darpa generated , some insights  
**Date:** Sat, 30 Apr 2016 18:35:26 +0000

---

A great many of these are predicated on the idea that brain and universe are mathematical. Math, in my view, is simply the domain of formal languages. Most of mathematics is not computable, i.e. the grand computer that runs the universe, however it works, cannot execute them.

Computation always works, i.e. computes something by transitioning from one state to the next. Computation can be probabilistic, and it does not need to align with the temporal order of the computed system (only with the causal one).

To a mathematician, functions have a value once they are sufficiently constrained. In computing, there is no value before it has actually been computed.

Computation can create arbitrary finite sequences of finitely resolved observables and should suffice for making universes and minds. The universe does not solve differential equations. Much of current physics is mathematical though, and not computable. I suspect that resolving physics or neural dynamics requires to make them computable, that is, use different languages.

Computer science mostly does this, but current deep learning treats intelligence roughly as a perceptual problem. Alpha Go 'perceives' the best move, where humans use a combination of perception, construction/inference and integration/reflection. As a consequence, machine learning needs to use vastly more training data. (Not the only reason, of course.)

Am 30.04.2016 um 06:56 schrieb Reid Hoffman <[REDACTED]>

these were from a while ago -- any startling results or progress that we easily know about?

sent from the mobile xperiment

---

**From:** [jeevacation@gmail.com](mailto:jeevacation@gmail.com)

**Sent:** April 30, 2016 9:20 AM

**To:** [REDACTED]

**Subject:** darpa generated , some insights

---

<http://www.math.utk.edu/~vasili/refs/darpa07.MathChallenges.html>

--

please note

The information contained in this communication is confidential, may be attorney-client privileged, may constitute inside information, and is intended only for the use of the addressee. It is the property of JEE

Unauthorized use, disclosure or copying of this communication or any part thereof is strictly prohibited and may be unlawful. If you have received this communication in error, please notify us immediately by return e-mail or by e-mail to [jeevacation@gmail.com](mailto:jeevacation@gmail.com), and

destroy this communication and all copies thereof,  
including all attachments. copyright -all rights reserved