

# Why You Will One Day Have a Chip in Your Brain

Kernel's Bryan Johnson says if humanity wants to survive AI, it's got to step up its neural game—with a silicon makeover.



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**Implanting a microchip inside the brain** to augment its mental powers has long been a science fiction trope. Now, the brain computer interface is suddenly the hot new thing in tech. This spring, Elon Musk started a new company, Neuralink, to do it. Facebook, at its F8 developer's conference, showed a video of an ALS patient typing with her brain. But earlier to the game was Bryan Johnson, an entrepreneur who in 2013 made a bundle by selling his company, Braintree, to Paypal for \$800

million. Last year, he used \$100 million of that to start Kernel, a company that is exploring how to build and implant chips into the skulls of those with some form of neurological disease and dysfunction, to reprogram their neural networks to restore some of their lost abilities.

Steven Levy is Editor in Chief at Backchannel.

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But helping to restore a damaged brain is only an entry point for Kernel. Johnson, a 39-year-old from Utah, is looking forward—with almost unseemly enthusiasm—to the day that healthy people can get neural augmentation. He has emerged as one of the most eloquent evangelists of reinventing the human brain. Needless to say, this effort raises lots of questions—the very questions I raised to him in a conversation recently. (It's been edited for clarity and brevity.) Will his answers make you sign up for a brain computer interface? (Warning: it's kind of invasive, but Johnson hopes that we might figure out how to do it without major noggin demolition.) Read it and make your own decision—albeit with your obsolete, unmodified brain.

### **Steven Levy: Why do you want to put in a chip in the brain?**

**Bryan Johnson:** The next frontier of human aspiration is inside our brains. We currently understand the world through our sensory mechanisms, and we will find thousands or millions of Everests as we unlock our brains.

### **We've run out of Everests, and now we have to make them up?**

I look at the current set of things that I could potentially do, and I would like more options.

### **These are things you would like to do but you feel constrained because your brain isn't powerful enough?**

Yes, I feel incredibly constrained in my current configuration. In my ability to process information, to remember it, to consume it, to think about it. Even my imagination—in my ability to contemplate things I'm unfamiliar with. I can only imagine things I'm familiar with.

**Couldn't some of these concerns be addressed by humans working in concert with machine intelligence, without having to change our own brains?**

Let me ask you this: What does the human race look like in 50 years or 100 years from now? What does it mean to be a human?

**I don't know the answer. Maybe my brain's too small.**

Humans currently reign supreme on planet Earth, because we are the most powerful form of intelligence. So therefore, we decide who we eat, who we have as pets, who we allow to go extinct, who is saved, who is neutered, who can reproduce. We are currently developing a new form of intelligence in the form of AI that is increasingly capable, whether it's conscious or not. For humans to be relevant in a matter of decades there is no choice other than to unlock our brains and intervene in our cognitive evolution. If you try to imagine a world where we are happy 30, 40, 50 years from now, there is no version of that future where we have not been able to figure out how to read and write our neural code.

**Right now, we haven't figured that out. What makes you feel that, even within a few decades, we will gain the understanding to do this?**

What did we know prior to trying to sequence the genome? What did we know prior to trying to go on the moon?

**Probably more than we know now about the brain.**

But do we *know* that?

**Seriously, what convinces you that we can “unlock” the brain and make ourselves superhumanly smart?**

I don't have any degree of confidence in our success. That's the most intellectually honest [answer] I could give. Society says that the brain is incredibly complex. But we haven't previously had the tools to properly probe it, so we don't know. We might make breakthroughs of fundamental understanding within 5, 10 years.

**You've said that one thing that might be beneficial for humanity would be to alter our brains to do more positive things. Like not going to war—would our brains be restructured to reduce hostility?**

All of those become options. I want that to become an option.

**Changing our brains to alter our feelings sounds dystopian to me. Haven't you seen *Black Mirror*?**

I have. This is the emotional experience we always have with emerging technology. When most people encounter this, they have the same visceral response: “That's scary. I feel uncomfortable. I like myself just the way I am.” As people warm up to the idea, they marinate in it and contemplate the other factors at play. Why do we think that what we have is so sacred? Why do we think that we are the holy standard at this point in time and that to change the configuration needs some massive justification? Isn't humanity a constant effort to change ourselves, through things like meditation? Are we not just inherently dissatisfied with ourselves?

**Those are changes from within. What I think might be scary about what you propose is that it won't only be individuals saying, “I'm re-programming my brain,” but that things might be imposed on them.**

I agree that once something's inside the brain it's different than, say, a cell phone. But all of these things are gradients of the same evolution we've always had. It's the same arguments that we've always had about emerging tech. The answer to all of

them is, I would love to live in a pleasant world. A world in which I can be safe, I can flourish creatively, I feel purpose and meaning.

**But if some people raise their abilities by brain augmentation, wouldn't people who don't change be at a disadvantage? They might not be able to compete in education, in jobs, and even in cocktail conversation. So it really wouldn't be a choice, would it?**

Well, how do you feel about some people getting a private education and other people being stuck in inner city schools?

**I don't feel great about it.**

So it's already happening. People somehow think that a cognitive improvement is something new to the scene. It's not. We just simply have different forms. A private education is a form of enhancement. Humans always do whatever they can to maximize their well being. If we simply add technology to the brain, it's a continuation of what humans have always done. Now, my hope is that we can build technology that would be accessible for billions. But the point is, this is not a new problem.

**You feel this is inevitable?**

Unquestionably.

**So when is your best guess of when you might have a computer chip in your head?**

It depends on the type of technology and it depends on whether nation-states would allow an elective process, instead of me having to have the burden of some type of dysfunction or disease. So, if I have a healthy brain, when could I get this? I would say within 9-10 years.

**Do you think in 100 years the books that have been written up to our time won't be read by people because they'll be too elementary?**

100 percent.

**All the great masters will look like stick figures.**

I don't think so. Future people will piece that story together to look back on this evolutionary track. Which humans did what? Which humans contributed what to our present day pleasantness and what are the things we've done well for this species?

**But it seems to me that you're really talking about a pivot in human activity, from a biological evolutionary pace into something which skyrockets it into a supercharged artificial evolution path that changes what "human" is.**

Exactly. We are now in the era of self-directed evolution. Genetically, biologically, neurologically, and physically. I'm just waiting for a nation-state to raise its hand and say, "We are the home for human potential. Bring your technologies and let's do it."

**Are there any nation-states thinking about that now?**

I've had a couple of conversations in confidence, and I would say there's more interest than a lot of people realize. When it comes to a nation-state's competitiveness, [I think] that once this starts breaking it's going to break fast.