

June 25, 2019
651 Dennison Ave
Columbus, OH 43215

Knowledgeworks

Dear Madam or Sir,

I am a senior level cognitive scientist with 30 years of research experience, have several books related to human knowledge and education, and would like to be considered for the position of "Director, Impact."

One large line of research over the past 15 years I call "harnessing", and argues that many of the capabilities we consider central to our being aren't part of our biological human, "human 1.0", heritage at all. Instead, culture over time has evolved to engineer itself to be well matched for the ancient human brain, and "harness" it to do new tasks it was never "meant" to.

For example, in 2006 I [provided evidence](#) that letter shapes across human writing systems are shaped like natural object junctions (i.e., the contour intersections found in natural scenes), thereby harnessing our ancient visual object recognition system for the new task of reading. We have the new power of literacy not because we evolved by natural selection to read -- of course we didn't because writing is much *much* too recent -- but because cultural evolution shaped writing to look like nature and thereby harness our object recognition system and re-use it for a new capability.

In my third book, HARNESSED (2011), I provide evidence that spoken language too is not something we evolved to do. Instead, cultural evolution has shaped speech to sound like something we're already innately brilliant at processing, namely the sounds of physical events amongst solid objects. This book was well received (e.g., "I'd be amazed if everything he says is right; but at this point I'd be even more surprised if his main ideas, which crack open riddles that have annoyed me for years, aren't on the right track." Frank Wilczek Recipient, Nobel Prize in Physics, 2004), and printed in multiple languages.

Writing and speech are not, then, part of our Human 1.0 repertoire, but are instead part of our Human 2.0 repertoire, thanks to the power of cultural evolution to shape itself for us. The astronomical difference between our current human 2.0 selves and our nearest ape relatives is by virtue of these technologies culture has plugged into our brain.

And there's no reason to believe culture has eased off in its harnessing of us. On the contrary, there's every reason to believe it is dynamically "designing" new harnessing technologies at a faster clip than ever before. To understand the future of knowledge we have to grasp the

principles that brought us from 1.0 to 2.0, and that are currently bringing us to 2.1, 2.2, etc.. My fourth book, HUMAN 3.0 (a hybrid fiction and non-fiction book), in fact takes up the longer-term future more explicitly, describing how these principles will change what it is to be human.

In addition to journal articles and the two books mentioned above (HARNESSED and HUMAN 2.0), I was asked to curate my own exhibition at MONA museum in Hobart, Tasmania, on these “harnessed” topics but in the context of the origin of art; the other curators were Steven Pinker, Geoffrey Miller, and Bryan Boyd, leading to a joint book, ON THE ORIGIN OF ART (2016). Some earlier hints at harnessing -- before I had fully developed it -- can be found in my earlier book VISION rEVOLUTION (“...one of the best works of theoretical vision science since Gibson,” Dan Simons, author of *The Invisible Gorilla*) which covers a variety of my perception-related discoveries, like why we have color vision, why we see illusions, and why our eyes face forward.

Academically, I am a polymath, with a strong cross-disciplinary background in theory, math, computation and philosophy, and used that rigorous training to focus on what I deemed to be the deepest problems in the cognitive and brain sciences. I have taught physics, astronomy, math, computer science, neuroscience, psychology, and philosophy at university over my many years, and have research (outside of the harnessing line discussed above) cutting across nearly as many fields. I have been a research and/or professor at George Mason University, University College Cork Ireland, Duke University, Caltech and Rensselaer Polytechnic Institute, and then started my own research and incubator lab in 2010. I have 20 years of experience leading teams of researchers.

I can communicate well, both in writing as evidenced by six books and many lay articles in magazines, and orally with a history of more than a hundred keynotes and talks, TEDs, and television appearances such as on Brain Games. I am invited worldwide for keynotes talking about my research, such as companies (e.g., Microsoft, Samsung), conferences, art museums, ad agencies, consumer product placement conferences, and so on.

In addition to being an academic, researcher and author, I also have experience founding and running a business. In 2012 I founded a startup called VINO OPTICS (<http://vino.vi>), an optical device company with technology that enhances perception of health and veins, sold to medical and tactical personnel. The technology comes out of my research on the origins of color vision and is designed to leverage our natural human color perceptual capability, and enhance it to see oxygenation variations under the skin better. No battery or electricity required.

On personalized education, my own research per se doesn't touch upon the issue. But my own personal experience as an academic tells me how important it is. I have read tens of thousands of papers over the course of my research, and most of them I could never have gotten through were I not *personally* invested in my own interests for doing so. Namely, I had my own theory I

was pursuing, and needed to read all those (mostly boring!) papers in order to understand the existing theories, the prior evidence, and the major players. Without that personalized motivation, even as a professional scientist I couldn't have learned all I learned! Personalization can just mean, Finding your own inspiring motivation. And that can make all the difference. That one might deem just another variety of... *harnessing*.

I believe I have the seniority, research interests, big-picture outlook, energy, leadership, and experience with public engagement needed for this exciting position.

Sincerely,

Mark

Dr. Mark Changizi

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<http://changizi.com/resume>