

May 26, 2019
651 Dennison Ave
Columbus, OH 43215

Dear Madam or Sir,

I moved to Columbus about five years ago, live in Short North, am interested in a full time job here in the city, and am specifically interested in the Senior Theoretical/Computational Biologist (67058) position. (I have also applied for the Principal Theoretical/Computational Biologist position (66833).)

I am a theoretical biologist / neurobiologist. My undergrad was in physics/math, and PhD in applied math and theoretical computer science. My start as a theorist was working in the lab of Christopher Cherniak in theoretical neurobiology (1993-1997), where we studied the large scale optimization of nervous systems using computationally intensive techniques.

My first job out of grad school was as a professor in the Department of Computer Science at University College Cork, Ireland, and after that I switched gears to become a theoretical biologist / neurobiologist, beginning in computational neuroscience at Schafer Corp, and then as a postdoc in neurobiology at Duke. I then won a prestigious Sloan-Swartz Fellowship for Theoretical Neurobiology at Caltech, and after four years there went to RPI as an assistant professor in Cognitive Science. I then started my own medical device start-up, VINO OPTICS, based on my research discoveries on the origins of color vision.

My research within theoretical biology includes...

- ["X-ray vision" and the evolution of forward-facing eyes](#), *J Theor Biol.* 2003.
- [Relationship between number of muscles, behavioral repertoire size, and encephalization in mammals](#). *J. Theor. Biol.* 2008.
- [Universal scaling laws for hierarchical complexity in languages, organisms, behaviors and other combinatorial systems](#). *J. Theor. Biol.* 2001.
- [Scaling of differentiation in networks: Nervous systems, organisms, ant colonies, ecosystems, businesses, universities, cities, electronic circuits, and Legos](#). *J. Theor. Biol.* 2002.
- [Four correlates of complex behavioral networks: differentiation, behavior, connectivity, and compartmentalization: Carving networks at their joints](#). *Complexity.* 2005.
- [Character complexity and redundancy in writing systems over human history](#). *Proc. R. Soc. B* 2005.
- [The structures of letters and symbols throughout human history are selected to match those found in objects in natural scenes](#). *American Naturalist.* 2006
- [Harnessing vision for computation](#). *Perception.* 2008.
- [Economically organized hierarchies in Wordnet and the OED](#). *Cognitive Systems Research.* 2008.

- [Common scaling laws for city highway systems and the mammalian neocortex.](#) *Complexity*. 2009.
- [The optimal human ventral stream from estimates of the complexity of visual objects.](#) *Biol. Cybern.* 2006
- [Principles underlying neocortical scaling.](#) *Biol. Cybern.* 2001.
- [Large-scale optimization of neural arbors.](#) *Phys Rev E*. 1999.
- [Are wet-induced wrinkled fingers primate rain treads?](#) *Brain, Behav & Evol.* 2011.

As you can see, I have a variety of research directions within theoretical biology, as well as a variety of research directions well beyond it. (More of my papers can be found at... <https://www.changizi.com/research.html>) Note that I do not have expertise on the genomic side. However, I have a strong background in computer science, algorithms, theory, and math, and have been agile over my career at coming up with novel techniques for approaching novel problems in biology.

I also have considerable experience writing, with five previous books about my research, and a sixth one on the way, and many dozens of articles on my research in magazines such as WIRED, Discover Magazine, and The Telegraph. I am also an able speaker, with more than a hundred keynotes, several TED talks, and a variety of appearances on TV such as Brain Games.

I believe I'd bring complimentary talents to the group.

Sincerely,

Mark
Dr. Mark Changizi
Columbus OH, USA
mchangizi@gmail.com
<http://changizi.com/resume>