

THE NEURAL NETWORK

LEARNING ABOUT OUR COMMUNITY

**LEAH BUECHLEY**

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WHAT WAS YOUR PATH TO CU BOULDER?

I wouldn't recommend my path, it was pretty random in a sense. I have an undergraduate degree in physics, and so I didn't have a background in computer science, but I had always loved mathematics.

This was at a point in my life when I was working in New York in the arts—it seemed like my life had gone back and forth between math and the arts. Well, I was really poor and just working jobs that didn't really feel like they were going anywhere. So I thought, OK, this has been fun, but I'll have a career in science or mathematics. I thought about going to grad school for physics, but I thought: "I'm not really a physicist—so, what else is appealing?"

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¹<http://leahbuechley.com/>

²<http://www.cs.colorado.edu/events/defenses/2007-2008/buechley.html>

³<https://www.rural-digital.com/>

Computer science struck me, potentially, as a way to be really creative and constructive with math, that seemed like its core essence. It also was really a philosophical draw for me as much as anything else. I had some CS experience programming in high school, but nothing really deep in my undergrad. Now, I grew up in New Mexico, and I knew I wanted to go to schools in the west, so I applied in the region. It was pretty lucky (and random) that I ended up in Boulder. Again, I would recommend that people be more thoughtful about graduate school than I was, I just happened to be really lucky.

HOW DID YOU COME TO WORK WITH MICHAEL EISENBERG?

I ended up taking several of his classes; that was the first connection. His classes were really appealing, in part because of the topics he was teaching. One of the first courses I took from him was computational geometry, and that ended up being a really amazing, wonderful class. I don't know if either of you have taken classes with Mike, but he's just an amazing teacher. So I got to know him through taking his classes, and ended up just loving him.

There weren't really opportunities to do research in his lab for the first couple of years, when I was getting my master's. Well, he ended up getting a big grant right when I done with my second year (I had just finished my coursework). He asked me to join his research group officially as an RA. The timing of his research funding and when I was available to start my own research lined up really well.

ARE YOU DOING RESEARCH NOW?

Yeah, although it's in a different context. (I think of what I do now as research.) I feel like I spend most of my time developing new ways of working with materials and technologies. I have spent less time doing educational research—that's just to say I haven't figured out a way to structure such research in my role as an independent designer/engineer. How it happens is a little less straight forward. It's hard for me to approach a school and ask to do research studies with the students, as a random person and not as an academic.

I still have a variety of opportunities to teach; and I always approach teaching experiences (as much as I can) as research experiences. That is, I'm learning and deploying the newest materials I've developed, then documenting and trying to make sense of how they're working in context.

I have a small design and engineering firm. I continue to work a bit on LilyPad, and I'm developing new technologies and approaches to combine technology, craft, education and art. I do a fair amount of teaching and consulting for educational institutions. I also have been giving talks in different contexts—and these end up mixed with consulting.

HOW WOULD YOU EXPLAIN YOUR RESEARCH TO A TEN-YEAR-OLD?

Maybe “Exploring ways to combine technology and art and craft to make things that are beautiful and interesting and fun”?

WHAT ABOUT WHEN YOU WERE WORKING IN COMPUTATIONAL GEOMETRY?

I'd have said something similar actually. Right now what I'm doing is related to computational geometry, but in the context of design; to make beautiful objects, and explore how one can use computational geometry in this way. I think we can choose to emphasize or de-emphasize that not only is computational geometry fun and playful and beautiful, but also that there's a tremendous amount of intellectual richness there, e.g., traditions in mathematics and computation that are really complex and deep and hard in many cases. But those can be connected in the spirit of play and exploration and beauty. That is, one can emphasize that those aspects of design and computational geometry are not at odds.

WHAT'S RECENT WORK YOU'RE EXCITED ABOUT?

What immediately comes to mind, in computational design, there's some beautiful work happening in ceramics, particularly computationally generated and fabricated ceramics. There's a couple in Berkeley, Virginia San Fratello and Ronald Rael⁴, who's been doing some awesome work in 3D printed ceramics—really gorgeous. As they make the objects they've also been working to develop the technology for fabrication, e.g.,

new kinds of 3D printers to make the fabrication possible. They also research materials, a lovely interesting example was one of their projects where they travelled all over the Western US collecting soil samples, then 3D printing ombré pots where the color gradient is generated by soils from different regions.

Nervous system⁵ is a company that was started maybe 5–10 years ago by some MIT grads. They consistently do amazing gorgeous stuff; they make jewelry, 3D printed clothing, they've been experimenting with ceramics (spectacular!). They're anchored in computation, mathematics, and biology. Their work derives from simulations of biological forms and structures.

And to mention just one more person, a fashion designer, Iris Van Herpen⁶. She's brilliant and amazing—working the intersections of, in her case, fashion and computation and fabrication. She's really one of the first people in the fashion context to make 3D printed dresses and clothes. A part of her work that I really enjoyed is that she beautifully blends technology with traditions of fashion couturiers, materials that've been finely crafted by hand, but that also might be 3D printed or laser cut. Anyways, I could talk at length about her work. In project, she 3D printed these soft curved shapes and stitched them onto garments; I really appreciate that sort of mixing and integration.

I think a different sort of person would aspire to be Iris Van Herpen, than, for example, Jon von Neumann.

WHAT ARE YOU MOST PROUD OF?

That's a tricky one too. Can I say my kid? I guess that's kind of ducking the question. I think professionally I feel wonder and pride that, in modest and meaningful ways, my work has impacted people.

WHAT WOULD YOU RECOMMEND PEOPLE DO WITH 3–5 MINUTES OF THEIR TIME AFTER THEY READ THIS?

Let's see. I feel tugged in different directions here. First, go and play. Spend 5 minutes playing and doing something absurd and delightful and strange on purpose. And second, go read about the Equality of Opportunity Project⁷. It's just a beautiful project, led by a group of economists at Stanford, charting inequality around the US. Particularly interesting to me is their work dealing with inequality in education; I think they grapple with the problems our society faces in a clear eyed way. I wonder, as a society, how do we get better? Go wrestle with inequality and those hard problems.

⁴<https://emergingobjects.com>

⁵<https://n-e-r-v-o-u-s.com>

⁶<http://irisvanherpen.com/>

⁷<http://equality-of-opportunity.org/>