



Season 2, Episode 1

Future of Work (part 1):

Communication Conundrum

SPEAKERS

Sarah Webb, Jerry Wang, Elaine Raybourn

Sarah Webb 00:00

I'm your host Sarah Webb, and welcome to season two of Science in Parallel, a podcast about people and projects in computational science. Over the next four episodes we'll focus on how the COVID-19 pandemic altered computational science work and how this sudden disruptive public health crisis marks a turning point toward a new work future. You'll hear from several computational scientists in different workplaces and career stages about the sudden transition to virtual work, how they coped and recent steps toward the new normal.

Sarah Webb 00:34

The pandemic shuffled our work lives in communication patterns and affected individual workers in different ways. But it also proved that virtual work could be productive and successful. And those lessons offer an opportunity: We can build workplaces that function better and are more inclusive.

Sarah Webb 00:57

In the early days of the COVID-19 pandemic, the challenge of moving work home didn't hit all computational scientists equally, or in the same ways. Here's Jerry Wang from Carnegie Mellon University.

Jerry Wang 01:11

A lot of people would imagine that computational science research, it's one of the easiest things to virtualize. To some extent it is, but only if you're kind of mature and you've already hit your stride and you've been around the block a couple of times, when you're first starting out. One of the most helpful things in the world is really just somebody sitting down with you end, tapping away on the same keyboard, and that's something that went away in a hurry in March of 2020.

Sarah Webb 01:36

Jerry had just started as an assistant professor of civil and environmental engineering in fall 2019. The following spring, he suddenly was lugging 50-pound workstations down hallways and delivering them to his students around Pittsburgh so that they could work from home.

Sarah Webb 01:51

Even distributed teams with years of experience collaborating virtually had to adapt to the changes of fully remote work. For example, Department of Energy's Exascale Computing Project had operated since 2016 as a large, distributed team. It includes 100 individual research teams and approximately 1000 researchers across all 17 DOE laboratories. I spoke with Elaine Raybourn, a research scientist at Sandia National Laboratories. Elaine works in the Applied Information Sciences Center and is also a principal investigator on one of the many components of the ECP: Sandia's interoperable design of extreme scale application software team that focuses on team of teams, productivity and software sustainability.

Elaine Raybourn 02:40

As a team, we function pretty much as a virtual organization. Certainly, we have a hierarchy, but we have a lot of autonomy as team members to interact with each other and to team for our role, which was basically to create a capable exascale system. What we did a lot of before the pandemic, quite honestly, was travel. A lot of our key decisions and information sharing, not unlike a lot of other organizations, happened in colocated meetings. And so we did have meetings where there could be a lot of innovation, a lot of creativity. And so it was these types of environments that were really key for us. But we also have strong leadership. We knew why we were doing what we were doing, and certainly we all had a mission that we were trying to accomplish. And so we had great collaboration tools. That's how we were thinking of our work. We weren't necessarily thinking about remote work as a challenge. It was the way that we did our work in conjunction with the colocated, face-to-face meetings.

Sarah Webb 03:49

And even before the pandemic, this largely virtual organization was still tweaking their communication and collaboration tools, Elaine says.

Elaine Raybourn 03:57

A lot of organizations have their own collaboration tools. And I think that was one of the most difficult hurdles. And we probably still experienced this to some degree. So it's a matter of, you know, which technology do we use? We're communicating with asynchronous tools and synchronous tools. Everybody's got a different configuration on their computer. So information technology was certainly one of the challenges that we dealt with. Another, of course, is cybersecurity and making sure that we can have secure remote collaboration. Managing distributed teams is always going to be challenging, and there's a lot of literature on that even before the pandemic. And also I think being a virtual worker for a long time before the pandemic, I think that another challenge that we had, but maybe we didn't discuss as much was how to really help those folks who are working remotely really feel included in the key decisions that are made mostly in colocated spaces. And so that's why I think there was so much travel was because we wanted to include everyone.

Sarah Webb 05:08

But suddenly, in March 2020, that option to travel and meet face to face was gone. And Elaine was in a unique position to reflect on this sudden change and analyze what happened and how people and organizations coped with it, because she's a social scientist who focuses on intercultural communication and human computer interaction.

Elaine Raybourn 05:28

So it's really a combination of communication, culture and technology. For most of my career, I've researched technologies for teams, such as intelligent community systems and context aware systems for distributed teams, also modernizing training with computer game technology, otherwise known as serious games. And then most recently, I've employed transmedia learning, which is connected experiences across devices and platforms. And so what really connects my experience with the whole working remotely topic is my interest in virtuality. And so when I was a little girl, I always wanted to be in two places at once. And I was always told that you can't do that, Elaine. I never accepted it. So I always asked: well, why not? And so here I am, you know, many years later in my career, researching, basically virtuality and blending virtual and real spaces, and trying to understand better how we can extend or blur these experiences across time and place.

Sarah Webb 06:29

So using the Exascale Computing Project, as an example, I asked Elaine what happened in March 2020 when an organization that already was highly distributed and virtual suddenly couldn't travel to meet and collaborate.

Elaine Raybourn 06:43

I think immediately what happened was shock. What's really interesting is that before the pandemic, I don't believe that really we thought of ourselves as working remotely when we were traveling, or when we were working from home occasionally, or if we happen to be at a conference, and we would occasionally check in with organizations that we just, we just saw that as part of the way that we did our business, or that was part of being productive. Then I think there was a perception that we could continue to do the work the way we had always done it. But I think that what happened is, once we realize that the change that we were undergoing was imposed, and it was unplanned. And once we started to see that we were using degraded communication channels, and that our communication channels, electronic communication channel was overused, I think we really started to pivot. And we really started to realize, okay, now we're going to have to learn new skills. And not only that, but we're also going to have to really think about unlearning old habits, and old ways of thinking about things, and especially thinking about what our expectations are for productivity. And this was where I think this was a very big sea change for most of us. Even for those of us who had been working remotely for decades, it was suddenly different. And what was different about it was that we were all going through it together at the same time. And that really had a huge impact on the workforce. Because for the first time, many people who had never considered themselves as working remotely, when they were on travel, suddenly they could see themselves in that position. And they were in some respects in different shoes. And they were undergoing that change, and they were feeling what it's like. And that has become an opportunity for us to just really reflect on what we can learn from this,

Sarah Webb 06:44

I felt this shift that Elaine is talking about too. I have worked remotely for more than 15 years. I'm now working in the same room with the same desk and chair as I was in 2019. But work feels different since March 2020. Elaine had years of experience working in a variety of settings, fully colocated environments, ones where she was primarily face-to-face with some colleagues while interacting across

time zones with others, and ones where she was one of many people interacting from remote locations. And she dove deeper into what those work scenarios now look like.

Elaine Raybourn 09:35

So first of all, one configuration that we're mostly all aware of is the configuration of individuals who are colocated in physical spaces. And when you think about that, a lot of our organizations are set up that way. But even if you have one building, and you have different team members that are on different floors of the building, maybe they're colocated with other people. That still is a remote work setting. If they have to interact, they are not colocated. So they've got to go to a local meeting area. And now I would argue that potentially a lot of those people are remoting in using conference technology to meetings that are held virtually.

Elaine Raybourn 10:21

And then another type of configuration or more of a scenario is where you have a colocated environment. But yet you have these satellites of remote employees or members of the workforce. And then you may also have distributed groups that are also interacting together. That is a really complicated environment because there you have not only colocated folks, but you've got different groups that are distributed. And then you may even have satellite individuals that are working alone.

Elaine Raybourn 10:53

And then the next environment we're familiar with now, especially if we don't have to go into the laboratories, is this environment where each of us might be working from a remote setting. We're connecting; we're all individual on the same playing field. But we are individually connecting to a virtual environment. And that's actually, if you think about it, the environment that is the easiest and where we find a lot of research indicates that these environments are actually the most equitable. The reason why is because we are all using the same technology. And we are connecting primarily, hopefully, with the same types of access, although that is questionable, some networking could be better than others. And for the most part, that's the most equitable scenario, working remotely.

Sarah Webb 11:46

Suddenly, many of us were in this last group. And we were all communicating electronically through channels that Elaine described as degraded. Many people experienced what we now call "Zoom fatigue," but I asked her to talk about what degraded communication means for virtual workers.

Elaine Raybourn 12:03

And a communication channel can become degraded for many different reasons. One might be that there are just so many people using it, that the connection is unreliable, or you find that technologies that you've used, are not scaling well. And so it was really an opportunity for us to see [pause]. I focus on "see," but actually, I wonder if the word I should be choosing is to viscerally "feel." And we went through something that has caused physical and emotional responses in us. You don't have as much agency over your own communication as you had before.

Elaine Raybourn 12:41

So think about it: Before most of us had a very robust life in the sense that if you were online, you chose to be online. You used it because you either wanted to or it was helping you get something done. You also had your face-to-face communication channel. And it was that nice, healthy combination and balance that was great. And it also was a locus of control. It was we who decided when we would use these tools, but then when we were hit with the pandemic, suddenly it wasn't a choice anymore. That was the only way you could communicate. And by the way, everybody else was communicating that same way, too. Unless you've thought about it or used those tools before, I would imagine a lot of people may have felt lost in some sense, because it wasn't giving back the feeling. You know, when you communicate face to face, over 70% of our communication is nonverbal. And we get a lot from that interaction. And suddenly that was gone, and so that's also what was making it a degraded situation.

Elaine Raybourn 13:00

And quite frankly, the influx of information was just hard for our brains to process. So it's just too much information in the same channel all at once. And we're using it for work now and for entertainment and for communicating with our family. All of you who may have heard people talk about Zoom fatigue and staring into the video cameras, it's really a phenomenon that we need to think about. On some levels. That is what was happening very commonly across the board was that loss of control. Basically, we didn't really know what to do when you think about it. The ways that we'd acted in the past, embodied communication really, that is face-to-face, relying on that embodiment is has sort of made us very lazy communicators. And when it's taken away, you realize, wow, I need to learn something new or that expectation I had that assumption I had going into this conversation I can no longer rely on that. Because now I have all this cognitive dissonance. What am I going to do?

Sarah Webb 14:53

That communication conundrum force people to adapt. We had to grapple with it in some way. With the Exascale Computing Project this situation led to a panel series called Strategies for Working Remotely that Elaine has led and moderated since 2020.

Elaine Raybourn 15:09

The way we started actually was as an experiment, honestly. The first session was in April of 2020. And at that time I we were in this moment of cognitive dissonance. And we knew that everybody was having these feelings. And in our informal conversations, we were referring to it.

Sarah Webb: 15:33

The ECP's Software Technology Director, Mike Heroux, deputy director, Lois McInnis, and the training and productivity lead, Ashley Barker, organized a panel, so that people could learn about remote work strategies from others with many years of experience. Elaine was a speaker on that first panel.

Elaine Raybourn 15:53

And after that panel, I approached Mike and Lois and Ashley and mentioned to them all the things that I was noticing. In ECP we had a very good infrastructure for formal communication. And we had also very good training and learning experiences like formal webinars. And what I noticed was that what we were missing was an informal communication outlet. So the gap was really as a community: How do we incentivize this dialogue across organizations across institutions to really bring together ECP in a way

that the face-to-face meetings used to do for us? So face-to-face meetings were not just a way to share key information or make key decisions. It was also a way to communicate informally, to network, to bond, to work on those relationships.

Elaine Raybourn 16:55

That really was missing when we first started the pandemic. And so that's why we wanted to think about: How can we fill this gap? And so I went to Mike and Lois and Ashley and said, look, you know, I really think that what we really need here, especially because part of our charter as the IDEAS team. And IDEAS stands for interoperable design of extreme scale application software. Part of our charter was to work on team productivity. What better way to help the teams be more productive than to provide an outlet where we could have informal dialogue, where they could share stories where we could hear from individual scientists talking about how they got the science done but talking about this tacit information that normally doesn't get shared.

Sarah Webb 17:46

They've held 13 panels so far that are all available online, you can find a link to them in the show notes. Elaine told me more about how they developed the topics and panels over time.

Elaine Raybourn 17:58

We knew what goal we had. We knew we wanted to build this community. What I've been doing is employing, believe it or not, the simulation experience design methodology to develop the panels themselves. I use that actually when I'm thinking about how to facilitate the panel. But then in thinking about the topics, the approach that I've taken, I've tried very hard to be organic. And what's been important to me is that the panels be very timely, and that they really provide information that's useful at the right moment. I spend a lot of time doing a lot of research and a lot of looking at trends and trying to understand when there may be something that's going to come down the pike that will be a question that we're all trying to solve. And so then that's how the topic forms pretty organically that way.

Elaine Raybourn 18:52

And then with panelists we just leverage our networks, looking for panelists who we know would be amenable with this setting. Because since it's a live event, we're looking for panelists who have things they'd like to share, and who would be open to that particular environment. And so we've had many different topics, starting mostly with looking at individual resiliency skills. So that might be learning about how to set up your workspace or parenting under these conditions and caretaking. And then we moved on to teaming and mentorship and onboarding students and early career folks. And then from there, we've evolved to looking at organizational change and some of the hybrid approaches.

Elaine Raybourn 19:43

And the topic of creativity has also come up because creativity innovation are so important to so many organizations and that's been a real concern that we would not be able to maintain the level of innovation and creativity that we need to as national labs. So we basically talk about all the topics that are really currently on the minds of all of our scientists. And honestly, our panel, since it's open, really does draw a lot of people outside of the Exascale Computing Project to learn how we're dealing with it,

how different laboratories are dealing with different aspects of what it's like to work remotely during the pandemic.

Sarah Webb 20:23

So from this process of creating these panels, and, and facilitating this series, were there any surprises for you, or anything that you didn't expect to come out of these panels that sort of popped up and you found interesting?

Elaine Raybourn 20:40

The topic that always comes up is the topic of the whiteboard. It's really funny. But so many scientists are just obsessed about the whiteboard. And it came up so often that I finally wrote a paper about it. My theory is that it's not the whiteboard, actually, that scientists really miss. It's the experience that we have at the whiteboard. That's what we really miss. One of the key surprises or lessons that have come out of this is that everyone is so concerned about not being able to be creative right now. And I think it calls into question the role of technology-mediated experiences and creativity. And how can we through technology maintain the level of creativity that we need? How can we become more creative? How should technologies be a force multiplier for our creativity? Of course, they should.

Elaine Raybourn 21:39

And so having worked on this, I think about it a lot. And, and that's why it's really important for us to, to start to think about the future of these hybrid workspaces with the advent of machine learning and artificial intelligence and more robotics. You know, what are the new ways that we are going to be experiencing telepresence? What will it mean to be immersive? What will it mean to collaborate? How can we really have a sense of presence that really rivals face-to-face? I think these are going to be some interesting topics that we will be discussing in the future, and we're not going to ignore the experiences that we've had. We will really bring that to the fore.

Sarah Webb 22:25

And that's where we'll wrap up part one. Please come back for part two to hear more from Elaine Raybourn, Jerry Wang and other computational scientists about how the pandemic brought both challenges and opportunities in their work lives. For more about our guests, the Exascale Computing Project and the Strategies for Working Remotely panel series, please check out the links in our show notes at scienceinparallel.org. Science in Parallel is produced by the Krell Institute and is a media outreach project of the Department of Energy Computational Science Graduate Fellowship program. Krell manages this program for the U.S. Department of Energy. This episode was produced by Sarah Webb and edited by Sarah and Tess Hanson.