



Women in Software and Cybersecurity

featuring Dr. April Galyardt as Interviewed by Suzanne Miller

Suzanne Miller: Welcome to the SEI Podcast Series, a production of Carnegie Mellon University Software Engineering Institute. The SEI is a federally funded research and development center operated by Carnegie Mellon and sponsored by the U.S. Department of Defense. A copy of today's podcast will be on the SEI website at sei.cmu.edu/podcasts.

My name is [Suzanne Miller](#). I am a principal researcher here at the SEI in the Agile-in-Government initiative. Today, I am very pleased to have with me [April Galyardt](#), who is going to be speaking with me about her experience as a woman in software and cybersecurity. So, I want to welcome you and thank you for sharing this time and sharing some of yourself with us. We always love learning about the people behind the technology, so this is a really fun thing for me to do. So, tell people what's cool about what you do. What is it that makes you go, *I can't believe that I'm actually doing this*?

April Galyardt: One of the coolest things about being a statistician is that your skills are valuable everywhere and anywhere. I have gotten to work with people in robotics, and neuroscience, and education, and cybersecurity, and I have learned an incredible amount from all of those collaborations.

Suzanne: So, your education is math and statistics, and was that always a passion for you? Were you the doing-math-problems-in-my-head kind of kid, or did something trigger that later on in life?

April: I was always kind of good at math, but I liked puzzles. So, like playing ridiculous amounts of [Tetris](#) and all of those kinds of games.

Suzanne: Did you grow up with [Sudoku](#)?

April: No, that's a little later.

Suzanne: OK, what about [Rubik's Cube](#)?

April: A fair amount of that.



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Suzanne: OK, alright. We are getting the picture here.

April: Right. [Legos](#), lots and lots of Legos.

Suzanne: Ah, Legos, yes.

April: I was always kind of good at math, but it was more a broad interest.

Suzanne: What took you from traditional math into statistics, because that is a whole different breed of math, it's not the...

April: It's very different.

Suzanne: It's not the formal proof kind of math. It's applied.

April: I have two degrees in mathematics and two degrees in statistics, and the kind of math I did was the very formal proof, abstract, absolutely nothing to do with reality anywhere ever.

Suzanne: But fun.

April: But fun. But puzzles. There was a program here at Carnegie Mellon, when I came back and was looking at my PhD. It was a program for interdisciplinary education research. That was what I was interested in: training and education and how people learn. I was really good at math. Statistics was the avenue for...

Suzanne: For getting into that.

April: For getting into that. It was funny because the first six months being in statistics, I often described it as arriving in modern Italy speaking only ancient Latin. There is connections, but there is a little bit of catching up to do.

Suzanne: Yes. I get that. The people that I know in the statistics field, they really do think that, *Yes, there's commonality underneath*, but they think differently about the same kinds of problems as a theoretician would think.

April: Yes. One of my mentors, he has described the difference between mathematics and statistics as, mathematicians start from, *Well if I assume this, what follows?* And statisticians start from, *Okay, this is what I need to do...what do I have to assume in order to do something?* It's similar but different.

Suzanne: It is 2019, we're both women working in software and cyber today. How is it different today than it was when you started?



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April: My experiences have largely been positive working with guys, and I know that there are many women who have had negative experiences. I have not had any. One of the things that I have seen that is different, when I talk to older women, that is when things start to come out. When I say I'm going to do something, they're like *Oh, I don't know, maybe*, and I'm like, *Yes, I'm gonna do it*. I think that is a measure of how much more relaxed [I am] in that I don't have to worry quite as much as even women 5, 10 years older had to worry.

Suzanne: When you go into different projects, how do you get the information that you need? This is one of the things that a lot of us talk about. One of the things that puts people off of working in software and cybersecurity, is there is so much information that we have to process and filter and deal with. That is one of my questions, how do you deal with that? Because we all have different strategies for it, so how do you deal with all that information overload?

April: It is often not the cybersecurity information overload, it's the DoD-acronym overload. You are working on a project with the Army, and they have got their set of acronyms. Then the next project is with the Navy, and they have their set of acronyms.

Often the way that works for me is that I know that I am an expert in statistics, and I am very good. Because I have that expertise in that area, it makes it easier for me when it is something else, [to say] *I don't know that*. Everybody has the knowledge that they rely on. So, when I am working on an Army project, there is somebody else on that project who knows the Army, all the jargon, and I can rely on them and not have to...I get to know what I know.

Suzanne: Another way of putting that is you have confidence in the knowledge base that is yours, but you are willing to be a beginner. You are willing to actually...yes, some people aren't willing to admit ignorance, right?

April: I have to be.

Suzanne: And so you are willing to do that. I find that to be very useful. It's humbling sometimes when you realize what you don't know.

April: Sometimes it is.

Suzanne: But to try and fake your way through doesn't help you or anybody else.

April: No, it really just goes poorly when you try to fake things.

Suzanne: When you were coming up in this area, did you find any particular roadblocks or detours that you had to take? I mean, you started in more theoretical and went to the statistics. How did that evolve? How did that affect your journey?



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April: It has actually evolved very organically. I started teaching math when I was 18 years old, so I have been teaching math and statistics for a very long time. When I joined the SEI, I didn't really think I was going to be teaching anymore, but one of our big initiatives right now is that there's a huge need for people in government and in the DoD, and across all of these areas, to know what machine learning can and can't do. If you're a colonel in the Army and you have to use machine learning in a particular project, what do you need to know in order to manage your machine-learning team? So now I'm kind of teaching again.

Suzanne: I assume that's something that you're enjoying.

April: Most of the time, yes.

Suzanne: Because most of us that teach, if you're away from it too long, you kind of miss it. So, the next generation. Not the same as we are. You know, the digital-native, digital-immigrant thing. They grew up with all of this technology around them. What do you recommend to people that are thinking about a career in cyber, in software, in statistics? What is advice that you would give them, knowing what you know about the generation that is coming on?

April: When you first started I was thinking of my seven-year-old daughter. When you finished, I was like, *Oh, we are talking to the kids in high school right now...*

Suzanne: You can talk to either one!

April: There are very different answers.

Suzanne: Or talk to both. Tell me about your thoughts on both.

April: For the kids in high school who are really thinking about what career to start now—and this is almost independent of whatever you're thinking—even if you are thinking about going into English, learn a programming language. Because the way that algorithms work and the way that we are interacting with these things, the way the Facebook algorithms decide what kinds of information that we get on a day-to-day basis, these impact our lives, and the more you understand that, even if you never program again, which I highly doubt, understanding how these things work will be incredibly beneficial.

Learn a programming language. Even if you are a musician, learn a programming language. The cool things that are happening with music and technology, that intersection is where the cool stuff is. That is the first piece of advice. The second piece is you are always going to have to learn new things, because everything is evolving so rapidly. I don't think this is a piece of new information. Be prepared. Lifelong learning is a thing.

Suzanne: Yes. One of the other people I interviewed said be curious, and I held on to that.



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April: That's a great answer!

Suzanne: Retain your curiosity. That will generate the motivation to learn. So yes, I definitely agree with that. Anything else that you want to tell us about that you think, especially girls coming up that you would want them to know about working in this area? What is cool about it, don't worry about this it's going away anyway, anything that you would want to say to them.

April: I know the environments can differ widely from company to company and place to place, and even just team to team. You will run across people who you just can't work with. Maybe it is not really you're a jerk or they are a jerk. It is just communication difficulties. That happens and that is kind of normal, and be prepared. When that happens, there is always something better waiting. You can always move forward.

Suzanne: You are allowed to move.

April: Right, you're allowed to move. You are allowed to change. You shouldn't stay when that happens.

Suzanne: I want to thank you for joining us today and for talking about your life in software, cybersecurity, and statistics, because that's the thing that brings you to us, and so I'm glad of that. It's been a lot of fun to talk, I don't get to talk to many statisticians, I have actually one really close friend who is, but I don't have that many in my circle. So this is really fun for me. But I thank you for sharing your insights and for helping us get the word out that this is a cool place to work, and this is a cool thing to do.

For our viewers, this podcast is available on the [SEI website](#), as I said at the beginning. It's also available through [SoundCloud](#), [iHeart Radio](#), just about anything that you would use to get your podcast, we now distribute it with. That is a good thing.

April is the author of [blog posts](#) and other things that you will find on other places on our SEI website. If you search under her last name, [G-A-L-Y-A-R-D-T](#), you will find her publications, and I hope you will go and read some of the things that she has written. Thank you today for joining us.