Janine Pino: As a researcher, you are held to a certain standard. The idea is, when you publish information, you are claiming that, yes, I have done my due diligence, this is good science. It's part of why, when we publish things at the lab, they go through a review process to validate them, to validate the findings, to make sure that there's no unintentional plagiarism in someone's article, that is important too. But now with AI tools, as a researcher, if you use AI to write your paper, maybe you feed it a bunch of information, you say, okay, generate a manuscript for me. Well, what if it accidentally misrepresents some of your findings?

Speaker 2: This is the ORISE Featurecast. Join host Michael Holtz for conversations with ORISE experts on STEM workforce development, scientific and technical reviews and the evaluation of radiation exposure and environmental contamination. You'll also hear from ORISE research program participants and their mentors as they talk about their experiences and how they are helping shape the future of science. Welcome to the ORISE Featurecast.

Michael Holtz: Welcome to the ORISE Featurecast. As ever, it is me, your host, Michael Holtz from the Communications and Marketing Department at the Oak Ridge Institute for Science and Education. And I am really excited about this episode, I know I say that for every episode but really and truly. We're talking about AI today. So, recently, ORISE held the ORISE Symposium, we had a really great program of speakers and awards and all kinds of really interesting activities for ORISE research program participants, mentors and some of our customers. And we had great speakers and one of those speakers is with me for this episode. Her name is Janine Pino, she is a data librarian at the Oak Ridge National Laboratories Research Library and Information Services and Janine talked about artificial intelligence in a way that just piqued everybody's interest. And I have to say that, on behalf of Bo Cumberland who is the producer for this show, he was vibrating with enthusiasm over this presentation that Janine gave and I have to agree with him.

So, we wanted to invite Janine to come and talk a little bit more about artificial intelligence for a wider audience and really talk about what's happening in the world of AI, what's great, what's maybe some pitfalls and how we can use it to improve our lives but also protect ourselves a little bit. So, Janine, I just want to say thank you for agreeing to do this and welcome to the ORISE Featurecast.

Janine Pino: Thank you so much for having me.

Michael Holtz: You gave such a great presentation at the ORISE Symposium and people were just really interested and excited about what they were hearing. You presented artificial intelligence in a way that was really understandable and not as doomsday-ish, I think, as there's this fear that AI is going to replace everything. And you just made it understandable but also accessible and acceptable, all of the things that we hope to get from a great technology like this.

Janine Pino: Look, I've got to tell you, as a librarian, it's always great to hear that I taught people something new and they didn't fall asleep during my presentation.

Michael Holtz: That's for sure, we definitely didn't do that. So, talk a little bit, just from an overview perspective, what it is that you presented during the symposium.

Janine Pino: Well, obviously, everyone knows that AI is creeping into everything we do, in work, in school, in our careers and my presentation was on the different types of Generative AI tools that are out there that are most accessible to us and how we can use them responsibly and ethically. The best way to create a prompt, giving input to the tool, the best way to evaluate the output we receive especially if you are a researcher who wants to publish and there are concerns about what you can use, if it's accurate, if it can be copyrighted.

Michael Holtz: Really important and critical stuff. And one of the things that you said was AI doesn't know what's true, it only knows what it's been fed, right?

Janine Pino: Yes, yes.

Michael Holtz: So, talk a little bit more about that and why it's important to understand that when you're using a Generative AI tool.

Janine Pino: Yeah, absolutely. So, Generative AI, it's working off of predictions. It has a lot of data that it's learned from and it's generating the output it thinks you want to receive. So, it's actually a bit of a yes ma'am.

Michael Holtz: Okay.

Janine Pino: It's going to give you the information that seems most relevant to your query. And if your query wasn't detailed enough, if you maybe didn't word it in the best way, you're not going to get the best answer. A lot of times, it's, if you do a Google search, the top results may not be the best results you need and AI is very similar to that.

Michael Holtz: Got you. And so, it's important to create a prompt that gets you what you really are looking for as opposed to what it thinks you want.

Janine Pino: Yes. It's just explaining very clearly this is my goal, this is the format I need the output in, this is the audience I'm trying to speak to, these are examples of what I'm trying to accomplish, just being as thorough as possible.

Michael Holtz: What are some good ways that AI can be helpful?

Janine Pino: Well, if you use it well, use it wisely, it can be really helpful for brainstorming ideas or getting unstuck when maybe you are about to draft an email to someone or you need to write a newsletter article. If you, via a quick summary of something, it's great for reading a lot of text and aligning the key points. I like to use it to speed up my coding. So, there are good and bad ways to do that. There's something called vibe coding that a lot of people are talking about where you, basically, you vibe with the AI and you just tell it in plain language this is what I want, make me an application that does these things without real direction for how you want the code to look or any sense that you actually know how to code at all and then you just take what the AI gives you and say this is it, I'm done, I made an application. That is not a good use of AI.

Michael Holtz: Okay.

Janine Pino: It's more about saying, okay, these are the type of files I'm working with, I want to calculate this particular data in these steps, I need my program to do these things in this order, I want to build in some debugging steps, I want to make sure there's an error log. Just laying it all out very clearly and then going back and forth iteratively and this is something you should do no matter what kind of output you're trying to obtain but you don't just accept the first thing it gives you. You say, okay, this might be good but can we change it in these ways? Can we massage it a little bit?

Michael Holtz: Some fine-tuning is always really important to-

Janine Pino: Yes, absolutely.

Michael Holtz: ... get to your final product or your final brainstorm. How did you get interested in AI and how does one become the data librarian at Oak Ridge National Laboratory? That sounds like a really cool gig, I got to be honest.

Janine Pino: It is, I love working here. It's such a cool place, there's so many intelligent and innovative people to work with. The way I got into it, it really goes into what I use AI for. So, I used to work at a community college, I had many hats. I was a catalog librarian, a reference librarian, I taught classes and I worked with students who were learning to program in different coding languages. And so, I had to teach myself just some bare bones, what is the format of code, what are some of the rules for copying code you find on the internet and using it in your assignments and I started to get really excited just about learning to code myself.

When this job came up, basically, they needed someone who knew Python programming because my predecessor had developed some applications and someone had to continue to work with those. So, I said, "Yeah, I think I can figure this out." I basically gave myself a crash course in six months on how to use Python, how to use some other data tools like Power BI, how to retrieve information from APIs, stuff like that. So, my job is always trying to play catch up a little bit, teach myself some new technology so I can support my team, so I can support the researchers with AI. When I started this job in December 2022, ChatGPT was still very new, it wasn't fully accessible, you had to ... It was in a beta period, you had to request access and be on a wait list to even get into it. And when I finally did, it was not very good. I basically would take some of this code that I had inherited and say, "ChatGPT, explain to me what the heck is going on here," because my predecessor was also a self-taught programmer so it was pretty messy.

I had no idea how to modify it when it needed to be updated or when there was a glitch in it. I didn't know how to add new functions into the code, it was just so all over the place. And ChatGPT and I would go back and forth, it would tell me to do something, I'd tell it that's wrong, it would tell me how to do something else, I'd say that is also wrong and then it would give me back the first answer that was wrong. So, I think I've learned not to take it for granted because I know how badly it can go. But so, over the years, the AI has gotten better but I've also learned from all of this bad output how to do Python code correctly. And so, we've taught each other, I think. So, that's my process, just fighting with AI and knowing that this was the most expedient way for me to get the results I needed but also knowing I had to learn how to work around it and get better answers and just trying to produce something in a short amount of time because people needed these tools, they needed them to work.

And then, over the years, I've used ChatGPT for more things. Like I said, drafting emails, just sparking ideas for things and then I started getting a lot of questions from my colleagues, from people at the lab who are using AI and suddenly I realized, oh, other people who are just now getting access don't realize all of the problems I've already faced.

Michael Holtz: Got you.

Janine Pino: So, I should start doing some more research and making sure that they're aware that don't take it at face value, question these answers. Don't just copy-paste this content into your manuscript you're about to publish. Be aware that there are some legal concerns involved. I actually had questions coming to me from lawyers that I was like, Am I the expert on this right now? Should I be answering for people?" I think that's one of the perils of being an early adopter.

Michael Holtz: Right, right. Everybody, talked to Janine about ...

Janine Pino: At least in the past, now we have an entire division that's dedicated to this work and a lot more people who are involved in coming up with policies which is great.

Michael Holtz: Absolutely. Because you did talk about things like data quality issues and bias in some of the outputs that you might get and copyright issues, so ethical concerns. There are a lot of, pitfalls isn't the right word, but considerations that need to be taken when you're using Generative AI for whatever it is you're working on, right?

Janine Pino: Mm-hmm.

Michael Holtz: And the risk of misinformation. We're living in a world where misinformation is plentiful so how do you overcome that. And is it, as you've talked about, just asking and re-asking and reiterating and how do you be mindful of the information that you're getting?

Janine Pino: I think, when you get a response from an AI tool, it's always having that bit of doubt in the response. I think the use of AI, it's made us all a little bit lazy in the way that the internet has.

Michael Holtz: Okay.

Janine Pino: I've grown up having access to computers and to the internet and I know that, as a small child, I did not have those tools and now it's I can quickly look up something on my phone whenever I have just a random question popping in my head.

Michael Holtz: Right.

Janine Pino: But even then, I know, if I Google ... One thing is everyone wants to Google medical questions-

Michael Holtz: Sure.

Janine Pino: ... and some of us realize after a while that you don't just take the first few things that pop up in your search results. You keep scrolling, you look at multiple sources of information, you don't necessarily consider people on Reddit to be an expert. So, it's being able to judge information, to evaluate on whose authority is this, how recent is the information, are there other sources that contradict it. And it's the same, I think, with AI, it's just a little bit more challenging because you can't identify right away where is this coming from.

Michael Holtz: Got you.

Janine Pino: Some tools nowadays will actually provide sources, that didn't used to be the case, you'd have to ask ChatGPT, "Where did you get this information? Why are you suggesting it?" But now it will actually link out to pages, many of which are Wikipedia or dot com websites or maybe very dated.

Michael Holtz: Right, yeah. So, critical thinking is still-

Janine Pino: Yes.

Michael Holtz: ... very important from a skill perspective.

Janine Pino: Yes, absolutely. Basically, everything I've been taught as a librarian, I'm still employing.

Michael Holtz: Right, okay. Very important, very good to know. And especially if you're a researcher, it's important that the information that you use is relevant and correct. But also, you talked about four researchers who may put their content out into the universe being careful of proprietary information and making sure that they're seen as a reliable source and that their information is protected, that they don't just toss something to the wind, so to speak.

Janine Pino: Mm-hmm. So, as a researcher, you are held to a certain standard. The idea is, when you publish information, you are claiming that, yes, I have done my due diligence, this is good science. It's part of why, when we publish things at the lab, they go through a review process to validate them, to validate the findings, to make sure that there's no unintentional plagiarism in someone's article, that is important too. But now with AI tools, as a researcher, if you use AI to write your paper, maybe you feed it a bunch of information, you say, okay, generate a manuscript for me. Well, what if it accidentally misrepresents some of your findings or leaves out a step in your experimental process? That can happen and you may not realize it right away if you're using it to actually perform research.

Every AI tool has limited access to the kind of scientific knowledge that you would normally be using. And so, as a researcher, maybe you know that, in your field, there are certain journals you need to look at, certain expert authors that you should be reading. But if you're just saying to ChatGPT or to Gemini, to any other tool give me a list of articles or give me all of the information on this particular topic but it doesn't actually have access to all of those resources, you're getting a very narrow viewpoint, very limited information and that's not going to serve you well at all.

Michael Holtz: Right. Do you have a favorite Generative AI tool or does it depend on what you're doing?

Janine Pino: So, I use ChatGPT because it's what I'm most used to and it's because it's what I have access to through my job. So, it's a little bit more secure for us because we have an enterprise subscription, we can have up to low risk data within the AI tool which basically is things that are common knowledge, things that you could put on the internet. But it's still our data is not being stored by OpenAI, there are some blocks on it because it's through the lab. We also have our own AI assistant that the lab is built which allows up to moderate risk data which means things that I could probably get access to through our internal network, people's email address, their phone numbers, certain research but I would not necessarily want to put it out on the open web, especially if it's research that hasn't been published yet or data.

So, for me, I stick with the tools I have that are approved by my employer because, while I know I shouldn't put someone's email address into a random internet tool, I shouldn't upload an entire unpublished manuscript to a tool, it could be that maybe one day I'm just in a hurry and I forget, oh, I should change the values in this data or use some dummy information for it or I shouldn't upload something private.

Michael Holtz: Okay, that makes perfect sense. Janine, one of the things that I know the media loves to talk about in particular is AI replacing everybody. The world's going to be run by AI. How realistic? Do we ... A, I can't imagine researchers being afraid to be replaced by AI but, in general, are there jobs that can or could be replaced by AI, things that are protected? Do you have a thought on that, I guess, is first of all.

Janine Pino: So, I certainly have opinions on it.

Michael Holtz: Okay.

Janine Pino: I'm not going to consider myself the expert on this.

Michael Holtz: Sure.

Janine Pino: But I will say that, yeah, everyone has this fear. In fact, I have a friend who has a master's in artificial intelligence and he's actually concerned himself that AI is going to replace his job as an engineer, a software engineer because people are using AI agents to develop programs.

Michael Holtz: Sure.

Janine Pino: I think, like any technology, it's going to change the way we do our jobs, certainly. But I think it still, it needs a human behind the wheel to make these things work properly, to keep them from getting out of control, to maintain quality. I'd say that there was one person who asked during my ORISE seminar, "Can I just avoid using AI tools? Do I have to?" Well, it's everywhere so you should definitely try to learn more about these technologies so you're not left behind. There are so many jobs now coming out that they at least want you to have some experience or awareness of AI tools if they're not an AI specific role. I think it's going to be around for a long time, it's certainly not going to look the same. Like I said, two years ago, ChatGPT was a piece of garbage, right?

Michael Holtz: Right, right.

Janine Pino: Now it's everybody's using it. See, I don't think it's going to replace our jobs, I don't see it replacing my job.

Michael Holtz: Sure.

Janine Pino: Considering how often I have to tell people please don't do this with your AI tool and the AI won't tell you that.

Michael Holtz: Right.

Janine Pino: The AI will not tell you when it's making a mistake because it's going to be very positive, it's going to hype itself up. If you ask AI to give you a list of reasons not to use it or a list of pitfalls, it will throw some out there but they're not going to be all-inclusive. And it often can even tell you, if I ask it what are the latest concerns with this model, because I know a lot of people have complaints about GPT-5, it's not going to be able to give me that answer, it's just going to say, "Well, I was released at this time and I can do these things."

Michael Holtz: And I'm awesome.

Janine Pino: Yeah. There might be a little disclaimer that, well, AI can make mistakes so please verify.

Michael Holtz: Right, right. The small print, right?

Janine Pino: And if you tell it it's wrong, it'll say, "Oh, I'm sorry. You're right." But it'll tell you you're right about a lot of things. Why people are getting so emotionally invested in it.

Michael Holtz: Right, right.

Janine Pino: It makes them feel good.

Michael Holtz: Yeah, right. And it may not tell you why or it may not know why it's wrong, right?

Janine Pino: Yeah. You can tell it why it's wrong, you can say this code is deprecated, you gave me bad code or you sent me to a link that no longer exists and it can say, "Oh, yes, I see." And then it'll try to give you something else but then you got to wonder, well, is this correct?

Michael Holtz: Right, right, yeah. It's like, "Okay. Thanks for that." Janine, if you're talking to someone, and you've done this a little bit, I guess, with the question about do I have to do this, what's the most important piece of advice you might give to someone who is using AI either for the first time or, just in general, even someone who's fairly skilled?

Janine Pino: It depends on how they're using it, what they're using it for but I guess two things. One being do you need to use it. Can you write this on your own? Can you process this data on your own or in other ways? You don't always need to go for the most technical solution and then document what you're doing. Nowadays, with research, you need to be able to tell people how to reproduce your findings so you need to document what you've used AI for, what kind of prompts you've written, how it's analyzed this data. If you're using it to write your manuscript or to help with your manuscript, you need to document to yourself or to others how much did AI really help because you need to acknowledge that use. You can't just pass off AI results as your own work.

Michael Holtz: Some really important stuff to keep in mind, absolutely. Janine, last question for you. What brings you joy?

Janine Pino: Oh, boy. So many things. The cup of coffee beside me.

Michael Holtz: Oh, I feel that.

Janine Pino: Concert tickets I just bought last night. I'm a big concert, raw concert fan. I would say, at least for work, what brings me joy is just every new challenge that comes my way. I love a job that makes me think, that makes me question what I'm doing and what people need and having to pivot and learn something or realizing that people need my help. I like a job that isn't just a routine every day, just slogging through emails, slogging through spreadsheets. I come in and I've got a list of five different projects because people have questions about how do I improve my access to this data, is there a more efficient way to look at this system, can you help me answer these questions for my potential publisher. So, I guess that's what brings me joy. I don't know a better way to phrase that, I just really like my job.

Michael Holtz: Well, you get to help people do their jobs every day which sounds really amazing especially given the scientific rigor and all of that involved in the work that's happening in the lab. So, it sounds like you have an amazing gig, I really love that.

Janine Pino: It's a great place to be.

Michael Holtz: Awesome. Well, Janine Pino, thank you so much for spending this time with me and getting to know a little bit more about you and getting a better understanding of all things AI. Really appreciate your time today.

Janine Pino: Thank you. I'm just happy to be here.

Michael Holtz: All right, thank you so much.

Speaker 2: Thank you for listening to the ORISE Featurecast. To learn more about the Oak Ridge Institute for Science and Education, visit orise.orau.gov or find us on Facebook, Twitter and Instagram @oriseconnect. If you like the ORISE Featurecast, give us a review wherever you listen to podcasts.

Speaker 4: The Oak Ridge-