The Future of Work podcast is a weekly show where Jacob has in-depth conversations with senior level executives, business leaders, and bestselling authors around the world on the future of work and the future in general. Topics cover everything from AI and automation to the gig economy to big data to the future of learning and everything in between. Each episode explores a new topic and features a special guest.

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Jacob Morgan: Hello everyone. Welcome to another episode of the Future of Work podcast. My guest today is Mary Czerwinski, principal researcher and research manager at the Visualization and Interaction Research Group at Microsoft. Mary, thank you for joining me.

Mary Czerwinski: Thank you so much for having me.

Jacob Morgan: As is tradition on the podcast, before we get into some of the fun topics, I would of course love to learn a little bit more about you and how you got involved [00:00:30] in this space that you're currently in.

Mary Czerwinski: Well, that could be a long story. Let's see. I studied Psychology as an undergraduate. In my graduate degree at Indiana University while I was getting my PhD, I got very interested in models of visual attention which means how do you predict how and where users will look at a screen and how they develop the ability to read, [00:01:00] why certain things pop out of the visual display, etc. then when I finished my PhD, I ended up, because of a two-bodied problem moving into industry, it was a perfect time for cognitive psychologists to move into industry because that's when there was one user sitting in front of one screen and the way that screen was designed and organized really had to maximize your visual attention wanderings. You needed to group things functionally on the screen [00:01:30] so that when the user needed to carry out a specific task they knew where to look and they can remember that and learn that very easily.

One thing led to another as things got more complex. The world became social. Things like interruptions, multi-tasking, constant being on 24/7 across all our devices, became another attention issue. Interestingly all along my journey throughout all these many years, [00:02:00] attention and focus and ability to multi-task and recover from interruptions has been a theme that I've just kept studying and it just turned out to be super timely in recent years because of information overload. That's where we are today.

Jacob Morgan: Yeah now especially. It seems like even going forward this is probably going to be a huge, huge area for companies and for us as individuals to be paying to, so

definitely [00:02:30] the right time. You mentioned you got your PhD in Industrial and Organizational Psychology.

Mary Czerwinski: No, Cognitive Psychology.

Jacob Morgan: Oh, Cognitive Psychology.

Mary Czerwinski: How you process visual and auditory information, how you remember things that stuff, how you make patterns out of data, make decision.

Jacob Morgan: Very cool. That's pretty interesting.

Mary Czerwinski: I love it.

Jacob Morgan: Yeah. I got a undergrad degree in Psychology and I took one or two classes on that. I was always really fascinated [00:03:00] by all that stuff. Of course, we'll spend a few minutes looking at some of those themes as well. Today, what are you primarily responsible for?

Mary Czerwinski: My research group, it has many, many different areas. We have a very diverse team. Me, personally, I am responsible for managing that team and making sure our research has direct impact on Microsoft and Microsoft's direction and products. I [00:03:30] will tell you the area we work in mostly. Mostly we work in the area of information visualization, how do you see patterns in large amounts of data. We are all grappling with that right now. I am sure you've heard the term data science.

Jacob Morgan: Of course.

Mary Czerwinski: Try to visualize what data scientists have to make decisions about. Then we have a small group that does work on making programmers' tools easier to use and making programmers' environment [00:04:00] better for focus and productivity. We actually just had a meeting on that topic today. It's wonderful to do research on that here at Microsoft because we have obviously many, many teams that are very, very interested in us helping them with that task. Then we have a group that is very focused on looking at the user's affect, their effective state meaning are they happy or are they sad or are they bored, are they frustrated. [00:04:30] What an intelligent system might be able to do with that extra little bit of context. That goes from everywhere from productivity tools that maybe you know when you get frustrated or bored or stressed to conversing with an agent that should know your emotional state so that the agent can react more human-like.

Jacob Morgan: I already have like a hundred questions for you that I'm going to ask about that stuff. Before I just into some of those things, how big is your team?

Mary Czerwinski: [00:05:00] I don't count it very often. I think around 10. As I said, we're a very multi-disciplinary team. I even forgot, there's a whole group of us that does work with the hollow lens and tools cutting across multiple devices for internet of things so I left out a big chunk of my group. Sorry, group.

Jacob Morgan: Well, you mentioned them now so it's okay.

Mary Czerwinski: Yeah.

Jacob Morgan: What is a typical day like for you starting from when you wake up?

Mary Czerwinski: That's pretty [00:05:30] easy. I wake up and have my coffee and I read the New York Times. Actually I read all the news, summaries and feeds like Tech Crunch and Bing for Professionals and the Science Times, I read all those conglomerations of news. The number one one is New York Times. I delve into stories as I see fit as I want to go deeper into those. Then, I catch up on my [00:06:00] email and I look at my calendar, my list of things to do. Sometimes I play tennis really early in the morning, other times I play at noon, other times I play at night so that's one kind of feature that varies depending on where all my tennis gals and guys can fit things into their calendars. This morning was a great example, I played tennis first thing in the morning. It's great when I can play in the morning because I come to work all [00:06:30] invigorated and I already caught up on my email, I'm ready to go. I usually just work pretty steady throughout the day.

I often eat lunch at my desk, which isn't a good thing I know. It's because I like to exercise so I make a swap there. My group also does group lunches. We like to do that socially when we can. Then I have a lot of meetings but I do block out focus time for key tasks [00:07:00] almost every day. I have some focus time that I blocked out for myself. I'm very fortunate in that my children are grown and out of the house and so if I need to catch up on things at home in the evening I have the luxury to do so where I have many hours that aren't scheduled with meetings and what not. I also like to garden and take care of my plants and stuff.

Jacob Morgan: I can [00:07:30] use some gardening and plant advice. I'll ask you about that stuff after the podcast.

Mary Czerwinski: Okay.

Jacob Morgan: I asked your colleague this question as well, Natalie, who I spoke with at the summit in Half Moon bay. What is it like being a woman in technology?

Mary Czerwinski: I've always been a woman in technology. It started for me, I was very, very lucky to be the oldest of seven. My brother, [00:08:00] Dan, was the second in line. Because my brother Dan was second in line, my dad always included me in everything he taught my brother with sports. I think this is crucial actually. I

grew up learning how to throw football, learning how to throw a basketball, learning how to throw a baseball, playing tackle sports with the boys. I didn't care, I was very confident. I played sports all my life, which I think taught me [00:08:30] tons of confidence and team, just great team, spirit skills and what not and camaraderie. I think that competitive upbringing, not only does it give you great side effects in terms of health and mental health but I just think it gave me a lot of confidence.

Fortunately, I've never lacked that. I had to be taught my place many times. I really thank my family [00:09:00] for giving me a lot of confidence. Being the only female in my lab, for instance, after my first year I was the only female in my lab for five years and we did everything, computer modeling, computer programming. I just didn't feel uncomfortable ever. I've never felt uncomfortable in the office, at work ever. I'm really fortunate because I don't think that's the story that you would hear from every woman but that's great.

Jacob Morgan: No, definitely not. Are there any specific [00:09:30] habits, rituals or routines that you've done over the course of your career that you think helped make you successful?

Mary Czerwinski: Habits? I am a very hardworker. I think that's another you get from sports is you really learn how to focus. Getting a PhD teaches you how to focus even further still. I'll even go back one step further. I want to a private school growing up. Actually I went private grade school and private high school and had excellent [00:10:00] tutelage and really learned how to focus and do hard work. When I got to college, I had to say, I'd be the only one in the study hall every night but I was in the study hall every night. I got straight As undergraduate. I think learning how to focus is key and being able to focus for hours at a time is really important in today's fragmented world. That's why I do the blocking off on my calendar, because I find I really don't think [00:10:30] as deeply or do as good a work when I don't have a significant amount of time to devote to something.

Jacob Morgan: Is that about being at the state of flow? I'm sure you've heard of that. Is that related?

Mary Czerwinski: I actually take exception with that word because you can't be in a state of flow at work that doesn't make sense. Flow is like when you lose track of time and you're ecstatic. I think it's more, it pertains more [00:11:00] to for instance running a marathon. You don't get in that state when you're at work. You never can quite get to that state at work. We like to call it focus. I think focus is key. You don't have to be in a flow state to get really good work done but you do need to focus.

Jacob Morgan: Okay. Now I'm curious, how come you can never be in a flow state of work?

Mary Czerwinski: You're not going to run a marathon at work. You're not going to put that much [00:11:30] physical effort into something say, your beta endorphins aren't going

to be flowing like that when you're sitting at your laptop. It's a whole different state of being in my personal opinion. Maybe someone would like to argue that with me but I argue with my colleagues that we're not shooting for flow, we're shooting for focus.

Jacob Morgan: No, it makes sense. I don't run marathons so I can't speak to that regard but I know that, for example, I do a [00:12:00] lot of writing, I write books. Sometimes for me, and I don't know if you would call this flow or focus, sometimes I have like my house music, my big headphones on my ears, and I feel like I can just go for hours and I'm in like-

Mary Czerwinski: Yes.

Jacob Morgan: I guess you would consider that focus.

Mary Czerwinski: No, actually that may be veering closer to flow because you're doing creative work and you have a really large block of time. That may be when you're able to start getting [00:12:30] your juices flowing and being able to flow. Most of us don't get that luxury. If I get a two-hour block to do something at work it's pretty good.

Jacob Morgan: Yeah, I know. I hear you on that. Let's jump into some of the topics, which I wanted to talk to you about and related to a lot of the research that you're doing. I was looking at the website, the vibe website [00:13:00] I just wanted to read for listeners the first two sentences that describe what vibe is. It says the visualization and interaction for business and entertainment group conducts research in the areas of artificial emotion intelligence, information visualization in machine learning and big data and human-computer interaction in software engineering. That sounds pretty hardcore, let's start off with the first one there. A lot of people are familiar [00:13:30] with, of course, artificial intelligence. We hear about AI all the time. What is artificial emotion intelligence?

Mary Czerwinski: That is where a system watches the feedback from the user. It could be the way that they squint their eyes, the way they curl their lips, or for their brow, the way they talk. Right now I'm talking with a lot of prosody up and down. That tells you something about [00:14:00] my effective state. It could even be the kinds of things you're typing. We can get a lot of sentiment out of the text you write or type or speak. You fuse these signals together, we can also get physiological signals, I forgot to say that. We could be able to maybe look at your heart rate variability from the camera. When we fuse all these signals together, we can get pretty good at assessing your emotional state. [inaudible 00:14:31] [00:14:30] as an input to the computer much as a mouse or a keyboard is an input to the computer, to learn your context.

Context is critical. What else are you doing? What's on your calendar? Were you just in email? Did you just get a horrible email from a colleague that upset you greatly? Are you just like you writing a document, writing a book? How are you

feeling at that time. [00:15:00] All of this information can be used to create a model about you and we can actually create a rhythm of your work like how you tend to work throughout the day. Where, an intelligent system could look at these signals and start to make more emotionally intelligent decisions about how to partner with you. If you've got a deadline and you're stressed and you're working frantically, probably not the right time for a personal assistant to come in and suggest that you [00:15:30] do something else for instance. Might be a good time to suggest a mini-break or a stretch.

Jacob Morgan: Or more coffee.

Mary Czerwinski: Or more coffee, absolutely, that you'll still get up and get away from your computer for a second which you might need to do. It also might be the time for that assistant to say, "You know what? Do not even think about interrupting this user. They need to focus and hold back all notifications across the systems [00:16:00] and across all software applications until that user comes to a more emotionally balanced state or finishes their work product or whatever, just to protect them from the outside distractions that might make their work product less good. That's what we mean, in part, that's a part answer to that.

Jacob Morgan: When you say intelligence system, is this people that are sitting in lab and they're strapped in a new bunch of different sensors and [00:16:30] there's a camera monitoring them? Is this something that is more used in the real world like here at my house where I'm speaking to you, there could be some system monitoring me?

Mary Czerwinski: Yeah, by intelligent system, we mean a system that uses software and machine learning algorithms to characterize and model your work behavior or your interaction or communication behavior whatever it is that is deemed to be useful [00:17:00] by the software product. What I'm talking about is a software system that can get to know you personally and work with you personally so everybody's different to help you focus and get great work done but also at the same time work with you when you're happy, work with you when you're frustrated. Maybe there's a particular software tool that's making you super frustrated. Well, Microsoft teams would like that feedback because we can't design [00:17:30] great products that make people happy if we don't know. That's another use of this kind of machine learning system.

The other thing I wanted to say about how we use these kinds of systems is that they can be used to create personal agents or assistants that help you but help you by communicating with you in a more human-like way because they know what your emotional state is. If you're very, very sad, it would be completely inappropriate for a Cortana or [00:18:00] a Siri or a Amazon Echo device to come back in a super cheerful way and not acknowledge your sad state. That just wouldn't feel natural. Humans would not do that with each other.

I'm using a glaring example but I think one that maybe is more accessible is you're frustrated. If your personal assistant comes back all super happy or

cheeky, that is not going to make you happy and you're not going to want to work with that assistant again. [00:18:30] Another way we use this effective computing work we're doing is to try to make personal assistants, chat bots, eventually robots that interact with you in a much more human-like that we will find more acceptable and natural.

Jacob Morgan: How does that work? Because obviously, as humans we're pretty good at evaluating somebody else's emotions, you can look at them and I can't explain to you how I know if you're happy or sad or angry [00:19:00] but I can kind of tell what your emotion might be. For a system, that's obviously probably super hard. Lots of algorithms, lots of ... what is the face doing? What is the tongue doing? Can you give people a sense of how challenge it is for a system for software for a robot or a piece of Ai to understand human emotion?

Mary Czerwinski: I'm not saying it's easy. I'm saying it takes [00:19:30] a lot of data, a lot of training time, a lot of personalization. It's not clear to me that humans are so much better than what we might be able to design systems to be quite actually. Humans hide their emotions a lot. They don't like to wear their hearts on their sleeves especially in the workplace you can imagine. I think it might be, to turn your question around on you a little bit, I think it might be even hard [00:20:00] to say that humans are very good at this.

Jacob Morgan: Fair enough.

Mary Czerwinski: Yeah, I think it's actually quite difficult. What it takes is very long user studies where users actually give ground truth information about how they're actually feeling to a system repeatedly over time so that the system can learn. Again, these models are very individualized. The one thing we know in psychology is that everybody is different. [00:20:30] Even if you're trying to track seriously mentally ill person, you'll find schizophrenics, someone who's suffering from schizophrenia.

Every single way you try to model across schizophrenics, you'll see before there's a major outbreak of their mental illness or they get readmitted to a hospital. One of them will stop sleeping so much at night. One of them will stop making phone calls. We're all very different in our patterns and so that's [00:21:00] why this takes lots of data and lots of longitudinal work with ground truth input form the user all the time, which by the way isn't easy either because users aren't that used to thinking about their emotional states. I know this from my research. People tell me this all the time.

Even just the user entering how they're feeling into a system, starts making them feel different really. They're like, "Oh! Hadn't thought about that. I'm actually bored right now. [00:21:30] It takes them a little while to get used to actually even feeling like they're being [veridical 00:21:34] in how they personally enter how they're feeling.

Jacob Morgan: Yeah, I know, it makes sense. The act of explaining how you're feeling changes how you're feeling.

Mary Czerwinski: Yeah, exactly. I think over time they get used to it and they get really fast at it but I think it does take a couple of days where like, "Hmm? How am I really feeling right now?"

Jacob Morgan: Is the goal of all of this, and I'm a huge fan of science fiction, is the goal of all of this to eventually create something like [00:22:00] there's a show called humans on TV where these androids these robots that look exactly like humans interact with humans and basically are like humans. I know that's stretching it a little bit and pushing it out maybe a few decades, but is the goal to eventually have AI or software or a robot or whatever you want to call it, being able to understand human emotion, interact with humans in a way that humans would interact [00:22:30] with each other, is that like what you guys are looking to build?

Mary Czerwinski: I wouldn't say that. I'm a big fan of always knowing if I'm interacting with a chat bot or a software agent or a robot. I'll never want to have to guess about that. No, that's not my vision. What I have seen is that just like with humans, if we can design our software assistants or robots or what not to be [00:23:00] more human-like, we interact with them more naturally, we trust them or we think they're more intelligent. We give them breaks when they make mistakes especially if they're apologetic about it.

It just makes throwing away the keyboard and the mouse eventually so much more likely and makes computing become so much more natural. Where we want to draw the line, and that's why I'm very happy I'm doing research in this area because I do want to see where we [00:23:30] draw that line about knowing who we're interacting with, that's still TBD. You said decades, I really don't know how fast this is all going to move. I know what you mean. I watched a show called Almost Human and it was the last emotional humanoid who you couldn't tell he wasn't human because he looked human, he acted human, all the rest of the robots had to be non-emotional. [00:24:00] It was fascinating to think about the camaraderie that formed because he was emotional. I thought that was an amazing series, it didn't go to the second season. It was definitely pushing on some of these issues.

I think the number one thing I'm worried about and this is probably what keeps me up at night is the idea that we design these emotional beings improperly. [00:24:30] Then, let's just use the example of a child. We know children model off their parents. I don't want a child modeling emotionally off a robot or an agent that is either flat in affect or doesn't have the right range of affect or is affectively inappropriate. Those things do bother me and definitely going to [00:25:00] keep my eye on that ball.

Jacob Morgan: Yeah, I would imagine that is probably a huge concern. The second part [00:25:30] was the information visualization, machine learning, big data, human-computer interaction and software engineering. What is that aspect?

Mary Czerwinski: I'm not sure what your question is.

Jacob Morgan: Basically, what is-

Mary Czerwinski: Two different things you're talking about there.

Jacob Morgan: Yeah. Looking at the Vibe website, the AEI component, the artificial emotion intelligence was the first aspect. The second aspect was the information visualization, machine learning, big data, human computer interaction and software engineering. The question is basically what is that? What does that mean?

Mary Czerwinski: I have two groups so I'm just going to [inaudible 00:25:51] apart for you. We have a group that does information visualization around big data and temporal analytics. You can imagine as the name sounds, [00:26:00] they try to take temporal patterns of data, spatial patterns of data, geospatial powers of data, whatever it is, and they try to bring it to a screen so that you can make visual patterns of it. Think beyond bar charts and pie charts. They're trying to invent new ways of looking at data often in three or more dimensions that people can more naturally interact with, maybe move their body around if we're talking a hollow lens. [00:26:30] If we're talking AR or VR, get in to the environment and really viscerally look at the data. They're really looking at new models of interacting with visuals around big data analytics. It's something that everybody knows they need right now. We're actually trying to form a new group on that.

That's a big effort right now. Then there's another group that does software engineering, as I mentioned before, they do human-computer interaction [00:27:00] for software engineers. Trying to make programmers more productive. They've even been looking at using physiological signals like emotion signals as well as pupil dilation, etc. With programmers to see where in the code base they should either refactor the code or where they might miss bugs or whether they're not just not paying enough attention because the code isn't maybe written so well it's really dense that we're having a hard time comprehending [00:27:30] it. We also take all the same tools that we've been throwing at productivity and the work space. We throw those same tools at developers to try to understand what makes developers more productive at work.

Jacob Morgan: I appreciate the explanation.

Mary Czerwinski: Thank you.

Jacob Morgan: When you look at the current state of AI today, where do you think we are with things?

Mary Czerwinski: I am no AI expert. I am a psychologist. [00:28:00] I think we are at an interesting point where simpler mathematical tools like linear regression are starting to be

preferred to deep neural nets because people can understand them and make sense of them. I have seen that trend happening. I also see that we can use these deep neural nets to get way more accurate predictions and classifications of things than we ever could without them. I don't see anyone throwing those away anytime soon.

[00:28:30] We're definitely at a point where AI and machine learning is taking over every facet of our life faster than I can remember any technology taking over in a long, long time. I think as a society we need to be super careful and mindful about the pace and the assumptions that are made with those data sets and machine learning algorithms. We need to have conversations as a society [00:29:00] about what's fair and best practices. It's really good to see companies coming together, big tech companies coming together like Google, Microsoft, Facebook to talk about privacy, ethics, security in this space. It's great to see the EU do something like the GDPR which is making sure that every citizen can see their data, delete their data, [00:29:30] ask for their data, know what's being tracked. I think we're making little steps but I think as a society we need to have a much bigger conversation about what's happening.

Jacob Morgan: As a researcher obviously you've been involved in this space for a while. Can you give us a sense of how fast things are changing or evolving in your industry, in looking at artificial emotion intelligence. I got to get used to saying that. [00:30:00] How quickly are things evolving in that space? In other words, when you first got started, what were you guys struggling with and how far have we can since that point?

Mary Czerwinski: Ross Picard really started the field here in the United States anyway, around 1990 when she first published her book called Effective Computing. I remember being a big fan of hers. She started with [00:30:30] like wearables that you put on your hand or your wrist so you could do emotion tracking physiologically. I remember thinking, "Wow! That's really interesting, I wonder what's going to happen to that." Then around 2010, I remember we started thinking about, "Oh, what if you could effectively index your whole life and play back your laugh track like best things in your life that happened to you automatically.

We [00:31:00] talked back then about creating a book of your life just for your kids but a different book for your loved one or I mean your partner for instance. We have these fanciful ideas about if you could index your life with emotions there would be all these compilations and interesting things you could do. We even talked about maybe the system could stop you from dating the same kind of guy, for instance so wouldn't that be great?

[00:31:30] But it wasn't until about 2010 when we had Dan McDuff from Ross Picard's lab come. He did the first system where we had seven different sensing mechanisms on the user and we tracked what they were doing on their desktop. We gave them back a visualization of how they were feeling by what they were doing every hour of the day. People looked at that system and said, "Oh my god, [00:32:00] I knew the big emotional things that hit me but what I was unaware

of, were the little micropatterns of badness or the little micropatterns of goodness.

Let's say you go to the same meeting everyday and you always feel like crap. It's like I was not aware of that. I could just say I don't want to go to that meeting anymore, my life would be so much better. They told us that they really wanted a system like this but they wanted it real time. At that time, we couldn't do it in real time. This system had cameras [00:32:30] on them and the phone and GPS trackers. We were sensing their galvanic skin response with the brace. They have all kinds of reason to connect, all kinds of stuff on them.

The next system, the next several systems we did over the years started looking at using wearables and sensing and doing all kinds of things especially to avoid stress. I remember people telling me I was crazy to work on this because nobody was going to do this and that was just insane that I was even studying this. [00:33:00] Now, it's like, Apple just bought a company on this. We're all in here at Microsoft working on this. You've got robots showing emotions that now everybody just takes for granted. That was literally eight years in total, where now these algorithms are off the shelf algorithms that are open-sourced and pretty much anyone can use to build their products that's emotional. [00:33:30] I think it's moved really, really fast. Ross may have been doing it way ahead of everybody else but she's my hero and she's amazing.

Jacob Morgan: Do you have the examples of how this is being used? I'm sure a lot of people listening to this were thinking, "OK, intelligent system, artificial and emotion intelligence, I get what shes' talking about but how would this actually be used? Maybe you can give us an example.

Mary Czerwinski: Okay. The simplest example [00:34:00] I can imagine anyone conceiving is simply, you say, "Hey Cortana", and Cortana detects that you're in a great mood. It's early in the morning when people's moods are usually positive anyway. Cortana comes back with a really positive response that's appropriate for you, not too happy because you haven't had your coffee yet and she knows that but happy enough.

"Cortana, help me, I forgot. I forgot something at home and I'm stressed. Can you tell [00:34:30] my husband that I'm going to be late?" Cortana comes back with a very sensitive response. "Don't worry Mary, calm down, I've got this. Your husband will be notified." It's appropriate. It's the way humans would, try to interact with other emotionally, calming them down, cheering them up, feeling sad for them when they feel sad, not bothering them when they shouldn't be bothered basically. That's [00:35:00] the bottomline. I don't think we're talking about like a grand scale of emotional ups and downs. I don't think that's appropriate for a personal assistants. I think the space within which they'll emote will be pretty subtle but it should be appropriate.

Some of the studies we've seen with robots for instance apologizing when they make a mistake seems to make a huge difference in terms of people wanting to

use them again. I think apologies might be [00:35:30] really important in this space as well.

Jacob Morgan: This might sound like a silly question.

Mary Czerwinski: It's okay.

Jacob Morgan: Why do think this is important? Why bother doing this? I have an Amazon Echo that I use downstairs, why does it matter if I use my Amazon Echo device and I get a response back when it's cheerful or it's more reassuring? Why bother doing that? [00:36:00] Why does that matter?

Mary Czerwinski: First of all, has the Echo device ever failed?

Jacob Morgan: When you say fail, I've certainly gotten responses that like don't make sense or, "I'm sorry, let me look that up for you. I don't know the answer", or like, "Here's the webpage that you can go to." I've certainly gotten stuff like that. If those are considered failures-

Mary Czerwinski: I certainly have experienced full on failures across all the devices. It's very, very frustrating. [00:36:30] You try the same thing multiple times it doesn't work. What happens is the humans glottal muscles start to tighten, your stress level goes up, your pitch probably goes up and you're harder to understand from a speech recognition perspective. That's the frustration loop. If a system recognize the frustration loop right off the bat, the system could probably circumvent that loop from happening in the first place. That's one.

Jacob Morgan: Actually, [00:37:00] I thought of a time when it does fail. I connect a lot of my lights. I have I guess you could call it a smart home, and so I try to turn my lights on and off using the Amazon Echo. Sometimes I say, "Alexa", and it doesn't here, or sometimes I say, "Alexa, turn off the light", and it turns off the wrong light and I have to say, "Alexa!" You're like, "God, how did you not understand?" Yeah, I do experience that.

Mary Czerwinski: I [00:37:30] think everybody experiences that, it doesn't matter which device you're talking about.

Jacob Morgan: Exactly.

Mary Czerwinski: I think ... those are very, very short interactions. Today, we do very short things. We're coming from the search field, those tasks aren't going to be the tasks that get carried out by our personal assistants in the future. The tasks that are going to require more information and longer conversations as the skill set becomes more complex. That case [00:38:00] in what we've seen even just doing like 17 turned conversations with an agent, you really do need to start conversing like a human.

Humans start to mimic the human they're conversing with the more they get to know it and vice versa. Also, humans tend to like humans that talk the way they do and have similar personalities does, the research has showed. We think it's going to be really important for your personal assistant to mimic you, to talk [00:38:30] like you do, to understand your habits because then you'll want to keep working with that assistant. We want to design the assistant that you never ever want to leave because you've invested so much and it knows you so well and you really enjoy working with it.

Jacob Morgan: Makes sense. I know that if my assistants were more helping, I would probably call on them more often. At the same time, I feel like their tasks are limited but you also [00:39:00] mentioned that in the future they're going to be carrying out different tasks. What sort of tasks are we talking about? You look five, ten years out, what do you think we're going to be able to do with these smart assistants?

Mary Czerwinski: We're designing those scenarios as we speak, that's my job in research. You're a huge science fiction fan so you know if they can be. If we go back to diamond age for instance, these assistants could be guiding us through [00:39:30] our lives if we trust them enough. They could be giving us all kinds of challenges, advice, teaching us things the sky is the limit. We're just at the brink of all of this happening now. Unfortunately we're very stuck in the search world and really discrete task world right now. My research is more looking towards a future where we're having conversations. That's a whole other ballgame and its' very understudied right now.

Jacob Morgan: [00:40:00] How long do you think it'll take at least according to your research, before we will get to a point where we can have more of those conversations?

Mary Czerwinski: Yeah, everything has to get better. We have to have more data. We have to have more longitudinal studies much like we're running ourselves right now where many, many people are using an emotionally [inaudible 00:40:21] system or at least a system that tracks them emotionally for long periods of time, for longer conversations like they have with their colleagues so we can build [00:40:30] these models but we're not there today.

Jacob Morgan: Probably in, what do you think? Like a decade?

Mary Czerwinski: They sued to tell me speech recognition was always 10 years and they've been telling me that for 30 years.

Jacob Morgan: It's hard to predict but hopefully it won't be too long.

Mary Czerwinski: Hopefully not.

Jacob Morgan: Are you seeing these types of things also being used at work? For productivity, for health, for wellness, do you see any applications of this being used for work?

Mary Czerwinski: [00:41:00] I have seen people using these assistants at work. But again, the tasks are so minimal they're using them as peripheral tasks when they keep focus on their core work. They're not using them for work. That'll be an interesting turn when we can start using these devices like how people sometimes use their phones in parallel with their laptop or desktop to get a side work job done. It'll interesting when we start weaving [00:41:30] in and out of these things. I think AR and VR are going to make that synergy happen a little faster than just sitting at you desktop but we'll see.

Jacob Morgan: Can we talk a little bit about AR and VR and what you're envision there and how this works together? Obviously for people not familiar, AR is augmented reality, VR is virtual reality. My simple explanation, augmented reality is the, what's the simple of it, a virtual [00:42:00] world overlayed over the physical world and VR is just the purely virtual world that you're in. How is this being used for that? What's your idea or direction that you're moving towards with AR and VR?

Mary Czerwinski: I'm not an AR VR researcher. I've not done any studies on AR or VR, so probably not the best person to ask. But I will see, you will see many personal assistants in both of those [00:42:30] venues, AR and VR. You've already started seeing the advent of psychotherapists in VR, you've seen coaches, speaking coaches.

Jacob Morgan: Really?

Mary Czerwinski: Yeah. You've seen empathy coaches now trying to teach you how to give a good job interview or trying to walk a mile in someone else's shoe so to speak. That is coming and that is all really interesting work. [00:43:00] I think it'd be quite effective. If you're really immersed and you're getting, let's just use therapy by a psychotherapist that's a agent and it's a good one, some of the research has shown that people are more willing to be honest and open with a virtual therapist as opposed to a real doctor in a real office.

There might be that little bit I feel safer in this "fake environment" than I would in [00:43:30] an actual office so I might open up more about myself. I think this is going to be an interesting future for training, for therapy, for empathy training. I think, yeah, it's just starting to happen now.

Jacob Morgan: Do you see your research impacting a lot of different industries, the artificial emotional intelligence? Obviously, you mentioned a couple of industries right there, is it something that you see being applicable to [00:44:00] every company, every industry, widespread eventually organization will have something like this at its disposal? Or every independent maybe for themselves?

Mary Czerwinski: Yeah, I see it as becoming extremely pervasive just as we can tell so much about you by the way you use your mouse and your keyboard. It's just another fingerprint that we can use to help you be more productive and more happy and healthy. [00:44:30] You know, it should be done very ethically with privacy and security at the highest levels. It can be [inaudible 00:44:40] of a user to get

these signals back about themselves. I know this because we've been living it. Since about 2006 we've been logging ourselves. It's very enlightening to see what your habits and your behaviors result in terms of your [00:45:00] happiness and healthiness. It's just like wearing a Fitbit. Tracking is always informative, whether or not it motivates you is up to you. Most of the time, we've been giving the signals back to the user for personal reflection. That seems to be very helpful.

Jacob Morgan: Yeah, I would imagine so. I have a Fitbit so I know what that's like. It seems like this would basically be taking that level of insight tenfold because you'd be able to get a lot more information about yourself, which could be pretty interesting to see. [00:45:30] You touched on privacy and security. Are you exploring that as well in concerns that people might have? What are you worried about in that space?

Mary Czerwinski: I'm not so concerned because Microsoft has been so ahead of the ballgame in terms of making sure we ensure everyone's privacy, security and behave ethically and they've been way ahead of the ballgame on that and so aggressive on that. If anything, [00:46:00] a lot of my research has been in some way [hamstring 00:46:03] be I have to be so careful about that stuff that it makes me feel good because I know that our users are protected. As a community, as a society, we're going to have to come up with ways of using these signals so that they're helpful and beneficial to our users and our customers and our society and not harmful. That's why I say I think we do as a country as a world [00:46:30] need to have better conversations about these things.

Jacob Morgan: Another weird hypothetical question for you. From all the research that you're doing, what kind of a world you imagine one day? Is it like I wake up with a smart assistant, I go to bed with a smart assistant, the smart assistant is with me at work, it's guiding me throughout the whole day, it's literally like a person that is always there with me, controlling [00:47:00] everything in my house, controlling my work life. What is the world that you are envisioning with all of this?

Mary Czerwinski: I, personally, I want my own personal assistant that really knows me and whispers in my ear, remembers people's names for me. I also want a neural implant that takes care of that too. I'm not sure how the two will mesh but I really want a neural implant so I never forget anything and I can learn everything. [00:47:30] That said, I think you might have many other assistants that take on the best of interests of, for instance, an organization or a product or even an institution like Microsoft or a university. They may be the go to agent for questions about that company so there may be branding involved in all of this stuff, I'm sure there will be. [00:48:00] There will be personalities associated with these brands and what not. I think it's a new world, it's all just starting as we speak. It's to be determined how many of these things we can put up with before our attention becomes just grabbed at every second of every day. We don't want that obviously.I would imagine your personal assistant will protect you from a lot of this as well as we talked about earlier.

Jacob Morgan: [00:48:30] I'm imagining the movie, "Her". That's ... excuse my dogs who are annoying in the background. That's what I'm imagining as I was listening to you talk, kind of like the movie Her. You also mentioned this idea of implants. If there was an implant available right now, would you do it?

Mary Czerwinski: Nope, I won't do it until version 3.

Jacob Morgan: Wait for it to be tested quite a bit. But then you would consider [00:49:00] doing it.

Mary Czerwinski: Absolutely. It depends on what does of course. If it corrects for something in my brain, that doesn't operate correctly, if it straightens my spinal cord when I have an injury, yeah, I will implant things. The neural lace idea where the 3D printing material actually grows in with your brain tissue [00:49:30] and reconnects in places where should have been connected. I think that's super cool. There's going to be a lot done. If I can go back and get my PhD in some bioengineering to work on that, I would go to that right now.

Jacob Morgan: Yeah, that seems like it's definitely a growing area. It sounds like this area of human augmentation might ... I know we augment ourselves a little bit now, we take [inaudible 00:49:56] pills, we drink coffee, we do things to make ourselves [00:50:00] work harder and longer. Are you worried that in the future maybe some of this might be used to augment ourselves to a point where it's like, I don't know, we're going to be more cyborgs than human?

Mary Czerwinski: No, we're already cyborgs to some degree. I have a bionic eye now I don't have to wear glasses anymore. We will. My favorite is the exoskeleton. I want an exoskeleton. I just want the suit to [00:50:30] monitor my heat level so it's always comfortable I never want to fall and break a bone. I want to be hydrated perfectly all the time. I want to eat just the right amount of food. I'm a fan of that stuff. We'll see how it plays out.

Jacob Morgan: Yeah, that's one of the things that I hear a lot of people talking about is this idea of human augmentation and where it might go. Yeah, I agree it's one of those where we just need to [00:51:00] see what'll happen. When you look at trends, you mentioned clearly bioengineering and bio hacking. I'm curious, what are some of the other big treads that you're paying attention to that are related to your space but maybe you think we should all be paying attention to?

Mary Czerwinski: I do not currently work closely with robots but I do think it's a space to watch very carefully. It has been for a long time obviously [00:51:30] but now that so many people aren't trusting the care of their loved ones to robots in different countries around the world, go back to the imprinting mention I made before about children possibly modeling off a being that isn't perhaps morally the equivalent of your father or your mother or whoever was the loved one that was raising you, having those values, having [00:52:00] the proper human affect that we all need for nurturing and motivation. That worried me a lot.

I'm turning my attention to that space because it's such a concern of mine right now. I guess there are, these robots that are becoming so human-like, they're going to be used for all kinds of really interesting things. I just want to monitor that right [00:52:30] now.

Jacob Morgan: I've seen my fair share of science fiction movies to know like, what's some of the potential bad scenarios are? Of course there are a plenty of good ones too..

Mary Czerwinski: Yeah, it is great when we can use these agents, whether they're software agents or robots to offload the human from during really repetitive boring work. I think that's great. Free as cognitively to do things that maybe we're better at, that are more demanding, that allows us to be more creative. [00:53:00] I think that's great. Maybe even just freezes up to have more free time so we don't have to work harder and longer faster. I actually have time for family and friends. That would be a wonderful way for this all tour [inaudible 00:53:15], that's my hope.

Jacob Morgan: Hey, I agree, that would be wonderful. Before we wrap and ask you some more fun questions, what advice do you have for people that are listening to this podcast that are maybe worried about what's [00:53:30] coming or are trying to learn more about these smart assistants. Any advice that you have for people listening to the podcast?

Mary Czerwinski: Some very near term advice is to stop being so scared about machine learning algorithms that help humans do simple tasks and make their work product better all around. I'll just use or really simple example [00:54:00] of PowerPoint. Nowadays, you go into PowerPoint, you're a PowerPoint presentation, a title and it actually goes and it does some data mining, it digs up all kinds of interesting points that you could use in your presentation from places like Wikipedia for example.

It even tries to create an outline for you. When you start out in content, it actually pulls up the designer, the intelligent designer that helps you lay it out so you don't have to figure out where to go in the menus to do all that stuff. This is all stuff [00:54:30] that when you're doing creative work, it frees you up cognitively again so that you can focus on the work product and not wear something as buried in a menu three layers down.

This is the kind of world that I [inaudible 00:54:44] guys going to help us move towards. One where creative work is actually more fun in partnership with AI. We have more time for the things we want to spend time on not the time where we dig into features and functions of software that we really could [00:55:00] care less about learning about. That's one thing. I see a real positive turn and I think we're starting to see the next five, ten years are going to be amazing in terms of what we can do with our software systems in creativity. At the same, I want to make sure that humans remember to balance everything since they can work harder and longer or more productively that they actually remember it's really important to go out and take breaks and walk for 20 minutes in nature [00:55:30] and hydrate and stretch and spend time with family and loved ones

because those are really important too. I think there's going to be a nice AI human symbiosis here. As a society, we just need to watch it and management responsibly.

Jacob Morgan: That tends to be a pretty common piece of advice I hear from a lot of the executives that are on the podcasts. It's stop being so scared and worried. Instead, look for opportunities instead of worrying about all the, I've been negative in the consequences [00:56:00] and just be aware of what's happening but don't do run and hide in the corner, instead look for the opportunities and take advantage of them. I'm glad you echo that sentiment as well.

Mary Czerwinski: Great.

Jacob Morgan: Now just a couple of fun questions for you to wrap up.

Mary Czerwinski: Okay.

Jacob Morgan: Starting off with, what is the most embarrassing moment you've had at work?

Mary Czerwinski: I do have one famously embarrassing thing I did in graduate school that I can talk about.

Jacob Morgan: [00:56:30] That works.

Mary Czerwinski: My adviser, Dr. Richard Schiffren, is an amazing man, amazing mathematician. We all had to take a math class that, for me, was very intimidating and hard and we'd stay up till midnight, 1:00 in the morning working on these mathematical algorithms. I remember one night I called, it must have been between midnight and 1:00 in the morning. I was super nervous to call him but I knew he stayed up really late. [00:57:00] When I started the conversation, I said, "Rich, am I embarrassing you?" I meant to say interrupting you but I said embarrassing. He said, "Well, not yet." I was like, "Oh god." You have to know, I look up to the sky a lot. I was like, "wooh!" I was so just really crushed that I didn't had ... but I would say most of my moments are like that. I spit something out that's the wrong word.

Jacob Morgan: It happens, we've all been there.

Mary Czerwinski: Embarrassing moments, yes.

Jacob Morgan: [00:57:30] It happens. All right, next question for you, if you could augment yourself in one way, how would you augment yourself?

Mary Czerwinski: Well, I'm a tennis player and speed is of the utmost. I might want to put on that exoskeleton so I can run really, really fast and hit the ball really, really hard.

Jacob Morgan: All right, that's a good one. What's a book that you recommend. It could be a business book or a non-business book.

Mary Czerwinski: [00:58:00] I mentioned the Diamond Age, it's one of my favorites of all time by Niel Stevenson. I'd recommend that one.

Jacob Morgan: I've never even read that one.

Mary Czerwinski: Oh my god, you have to read that one if you haven't read it. It predicts everything about AI.

Jacob Morgan: A Diamond Age.

Mary Czerwinski: A Diamond Age.

Jacob Morgan: I'm going to put that on my list and order that one today. I've read a lot of the Isaac Asimov stuff, the I, Robot stuff, Foundation stuff but the Diamond Age [00:58:30] is going on my list.

Mary Czerwinski: Yay! You'll love it.

Jacob Morgan: If you are doing a different career, what would you be doing and why?

Mary Czerwinski: Well, I was really into bio genetics undergrad. I'm not sure now if I would go back into it or not because it's really detail oriented now and there's so much competition in that space. I might go more into [00:59:00] studying the exact way the brain works using all the kinds of neural imaging we have now would be really fascinating for me. I did that when I was getting my Master's Degree. We did that with a huge machine called a Tachistoscope, where we could send signals to one side of your brain and then look at the response from the other half of the brain. It's called hemispheric asymmetry. I was really into that and I could have kept going [00:59:30] into that. Now we have so many better ways of studying that neural interaction that could be fascinating to go back and do that.

Jacob Morgan: If you could have dinner with anybody, alive or dead, who would it be?

Mary Czerwinski: Oh my gosh! Oh my gosh! Roger Federer.

Jacob Morgan: Right. Clearly, you're really into tennis.

Mary Czerwinski: Yes.

Jacob Morgan: All right. Roger, if you're listening, or if anybody knows Roger, [01:00:00] please pass the word along. If you could live anywhere in the world, where would it be?

Mary Czerwinski: I can and I choose Seattle.

Jacob Morgan: All right.

Mary Czerwinski: The Netherlands is my second favorite country.

Jacob Morgan: All right. Then last two questions for you, if you could get rid of one workplace practice today, what would it be?

Mary Czerwinski: The thing that I keep harping on is the shorter and shorter deadlines for everything. [01:00:30] We never get as much time to process information, to make decisions even doing annual reviews. Everything get shorter and shorter and shorter and you're not told about deadlines in a timely manner anymore. I think that's my number one problem with workflow these days. The time horizons keep shortening and therefore we can't do as good as work product sometimes I think.

Jacob Morgan: All right. Last [01:01:00] question for you. If you could implement one workplace practice, what would it be?

Mary Czerwinski: If I could implement one, well, we're trying to get people to notice that there's thing called Quiet Hours, in Cortana and Windows. What Quiet Hours does, you turn it on for a length of time and you can turn off notifications and non-work-related websites. I think people might really benefit from finding that and [01:01:30] turning that on when they need to focus. I think it could really help.

Jacob Morgan: All right. Everybody should be using Quiet Hours, I like it, installed it, everyone at Microsoft needs quiet hours. We have talked about everything that I could think of. Are there any last parting words of wisdom you would like to bestow upon the Future of Work podcast listeners?

Mary Czerwinski: I'll just make sure you hydrate, sleep, cordon off time so you can be productive [01:02:00] and have a great diet and exercise and you'll be happy and healthy.

Jacob Morgan: I like it, very simple and to the point, Mary, thanks for taking time out of your day to speak with me.

Mary Czerwinski: Thank you, Jacob.

Jacob Morgan: Thanks everyone for tuning into this week's episode of the Future of Work podcast. My guest again, oh my goodness, choking on my words. My guest again has been Mary Czerwinski, principal researcher and research manager of the Visualization and Interaction Research Group at Microsoft. I will see all [01:02:30] of you next week.