



SIGGRAPH 2024

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SIGGRAPH Spotlight: Episode 72 — Emerging Technologies Expand Beyond CG Boundaries

Narrator: Welcome back to SIGGRAPH Spotlight, where we explore the fascinating world of computer graphics and interactive techniques. In this episode, Masuda Glencross, SIGGRAPH 2023 Emerging Technologies Chair, engages in a conversation with three SIGGRAPH Asia contributors: Jessica Korte, Mike Seymour, and Paul Dietz. Together, they explore diverse aspects of emerging technologies within the computer graphics space. These discussions span projects, trends, accessibility, and the evolving narrative in the realm of extended reality. Let's dive in.

Mashhuda Glencross: Well, hello, everyone, and welcome back to another exciting episode of SIGGRAPH Spotlight. I'm your host Mashhuda Glencross, and I recently served as the SIGGRAPH 2023 Emerging Technologies Chair. I'm also the SIGGRAPH Asia 2023 Doctoral Consortium Co-Chair. Outside of SIGGRAPH, I'm Director of Teaching and Learning in the School of Electrical Engineering and Computer Science at the University of Queensland, and I lead the graphics and visualization group. My research interests are in interactive computer graphics and perception, and the use of image-based approaches in interactive graphics applications. My new research project focuses on using extended reality technology for near real-time data in just-in-time training during severe weather events. Joining us today are three exceptional guests, all of whom have had great interest in and have made many contributions to emerging technologies in computer graphics and interactive techniques. First of all, we have Dr. Jessica Korte, a contributor of SIGGRAPH Asia Emerging Technologies, Dr. Mike Seymour, another contributor, and Featured Sessions Chair for SIGGRAPH Asia 2023, and Dr. Paul Dietz, who served as a past SIGGRAPH Emerging Technologies chair and continues to contribute actively to the program. Today, we're diving into the ever-evolving world of emerging technologies. Before we start our discussion, could you each introduce yourselves to our listeners and start with your career background and your involvement with SIGGRAPH? Jess, would you like to start first?

Jessica Korte: Sure thing. So, my name is Dr. Jessica Korte. I am a research and teaching academic at the University of Queensland in Australia. My research area, I like to describe as human-centered AI and or participatory design depending on exactly who I'm talking to and which bit of my research we're focusing on. I got a PhD from Griffith University and have been researching at the University of Queensland ever since, although I am shortly going to move to Brisbane's other big university, Queensland University of Technology. The research that I do focuses on how we can make technology, particularly at the moment AI technologies, better by working with the people who are going to be using them to make sure that we're focusing on what real people really need from these technologies. At the moment, my major focus is working with the Australian Deaf community to create a smart home personal assistant that can understand Auslan for Australian Sign Language.

Mashhuda: Thank you, Jessica. We'll certainly return to that fascinating work later. Mike, could you introduce yourself to our listeners, please?

Mike Seymour: Yeah, yeah, absolutely. So, I'm Mike Seymour. I'm at Sydney University where I co-founded MOTUS Lab, where we make digital humans. So kind of the best way to think about



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that is we put a human face on technology. So I've been doing that for a while, but my background is the VFX industry. So I was, for a long time, doing VFX and I still do a lot of consulting work to Hollywood studios and stuff. I got involved with SIGGRAPH years ago, like I've been going to SIGGRAPH, I don't know for how long, I adore SIGGRAPH. When I first came out of university, I used to get the SIGGRAPH proceedings and we'd sort of comb through it too, like, it was the window on the world of computer graphics. So yeah, very enthusiastic to not only go to SIGGRAPH but of course to be involved in helping to organize it down here where I am in Sydney.

Mashhuda: Awesome. Wonderful. We'll talk a bit more about your digital humans work later on as well. Paul, could you give us an introduction, please?

Paul Dietz: Sure. So, I'm Paul Dietz, I have had a long career in, mostly in corporate research at Walt Disney Imagineering, Microsoft, and Mitsubishi Electric, co-founded a company called Misapplied Sciences, which was the company behind Parallel Reality displays, which are these crazy displays that look like ordinary LED displays, but can actually show different information to every single viewer simultaneously, no special classes. Past work that has been very impactful was some of the early work on multi-touch. At this point in my career, I'm currently Distinguished Engineer in Residence at the University of Toronto in the computer science department. Mostly, I just got tired of enhancing shareholder value and wanted to do something a little bit more impactful for the world. So, these days, my focus really is on creating different sets of experiences that address what I consider to be major social issues.

Mashhuda: Thank you, everyone, for the introductions. Jess, let's start with you. As an Emerging Technologies contributor, could you tell us a little bit more about the projects that you've been involved in? What are you working on now? Where do your interests lie in the emerging technologies space?

Jessica: As I mentioned in my introduction, my major project at the moment is the Auslan communication technologies pipeline project, which is the very fancy name for a personal home assistant similar to your Amazon Alexa or Google Home-type device that can understand Auslan, which is Australian Sign Language. This, to me, is a very important project, because we're starting to see more and more voice-activated technologies, which is great for most people. But if you're a deaf person whose first or preferred language is a sign language, they're pretty much inaccessible, and of some of the Deaf people that we've been working with on the project, those who have home assistants often because family members or housemates have them, they complain that it's not very good at recognizing their voice, because often Deaf people can have a bit of a speaking difference to their voice that, to a listener, you don't even notice it. But the personal assistants seem to struggle with it. And that's not even getting into deaf folks who prefer to sign rather than to speak.

Mashhuda: Can you actually tell us a little bit about the ongoing contribution in this technology space that you see, to help support deaf people?

Jessica: My team and I have been working with a number of the local deaf community. We have three research assistants who are either deaf or coders, that's children of deaf or a child of deaf adults, who are all fluent in Auslan. This has been incredibly important because I wanted to make sure as someone who was not deaf or a native signer myself that we were embedding the



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sign language knowledge all the way through the project. We're also working with a Deaf Advisory Panel of 12 Deaf folks who've been involved in various participatory design activities, ranging from very traditional interviews about: could you imagine this type of technology? Have you used the existing voice-activated ones? If you did have one that spoke sign language, would you like to use it? How would you like to use it? Through two co-design workshops, particularly focused on the sign language avatar that we have to sign back to people and a very interesting VR project where we got not all of our Deaf Advisory Panel, but a few of our participants, to essentially give them an opportunity to interact with a virtual reality, personal home assistant that would understand their signing, by which we mean we had an interpreter and a Wizard of Oz style set up, where we press the key as they signed to see did they actually like the feel of this kind of technology?

Mashhuda: I'm really keen to see whether or not there are any intersections between yours and Mike's work, particularly in terms of, you know, using digital humans and how, you know, people might find digital humans signing in a participatory design context as they had and compare with an avatar. I think it is a fascinating space, so thank you very much for all of that, Jess. I'll head over to ask Mike now about, you know, kind of what's your unique perspective in terms of how emerging technologies are not only influencing the SIGGRAPH conferences but also broader industries and communities that they touch?

Mike: I guess, um, it's a great question. And by the way, I think Jessica's work is awesome. Really, really good stuff. There's, there's actually some interesting digital human work being done in New Zealand with Meta humans from Epic. And I was really interested to learn, obviously, Jessica would know this, that not only is there sort of issues with how personalized that is, in terms of you obviously want to have the language of the region. I mean, I was so ignorant. I didn't understand how different sign languages were so different between countries, but also just how important it is to have people of the right ethnic background being the data source to provide that information, so that you're not getting sort of, and of course, this comes into my play because we have all a lot of ethical issues as much as we do technical issues. In Jessica's case, it would be inappropriate for me to sign if I could, which I'm, I'm afraid I can't but you know, into another person sign language that I wasn't from that background. But of course, digital humans and that technology that we look at does provide a face that can allow some misdirection. So we both focus on the technology, and I think that's one of the great things about SIGGRAPH, obviously. But it also is the case that we try and cover some of those ethical and kind of societal issues about, you know, what is the appropriate thing to do. Now, I guess my point in bringing this up, in addition to just applauding the great work that Jess from the team does, is that, like, what we really need to do to get in front of these problems, is we need to kind of use emerging tech so that we can, what we like to call "create thingatrons." And what I mean by that is, it's really good to use emerging tech to be able to sort of mock stuff up and get in front of issues so that we can see what those are, because what we don't want to do is sort of have technology embedded, and then we start to discover the detrimental aspects of it. And so what I love about emerging tech is because it's emerging, it's the cutting edge, you can say, well, let's maybe mock this up and maybe it's not game ready yet, but heck, it will be in a couple of years. But by gaming it up now, and getting this stuff in front of people, then we can learn a lot about what would be a better user experience, what a better ethical experience, what would be a more culturally sensitive approach. I find that's one of the great aspects about SIGGRAPH. You're basically looking under the hood of what we're going to see in the more general public's sense.



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And so I think we need to applaud SIGGRAPH for providing both a technical platform and that honestly valuable role in letting us get in front of obviously quite new and sometimes confronting technologies.

Mashhuda: Yeah, I think it's quite interesting to just see how much SIGGRAPH Emerging Technologies has influenced communities through evolving emerging technologies first showcased there, and then becoming thing a real thing in real application context. I think it's going to be pretty exciting to see Jess's Auslan Alexa in the wild as a real application one day. I think there are some really good synergies here with your work, Mike, as well, so, in terms of just the ability to connect these different areas of research and that's another real opportunity that emerging technologies really gives people, to see what other people are doing research-wise and connect the research.

Mike: I couldn't agree more, it's just so important to actually be able to see stuff rather than just hypothesize about it. And that's why actually attending SIGGRAPH is so good. Like if you're actually there, it's like that Hamilton song, right? You need to be in the room. When you're experiencing these things firsthand, it's really impactful.

Mashhuda: As a Featured Sessions Chair at SIGGRAPH Asia, a lot of your focus in featured sessions is around extended reality storytelling. How do you think the insights from this session can influence or align with emerging technologies as a whole?

Mike: Look, I think they are a marriage made in heaven. The reality is that what we want to see is new ways of doing things, basically. And so new ways of storytelling, obviously we want to encompass new forms of emerging tech. I mean, one of the things that I think is always problematic is when new things come along, it's easy just to sort of extrapolate and say, oh, you know, the internet is going to provide books online. And you kind of stop there, right? And it isn't that, that is, like one of the biggest sites in the world is YouTube, right? Where people just upload their own videos, they don't actually do anything. But at the start of the sort of the internet, you wouldn't have said, oh, well, the site that doesn't make anything is going to have the second most amount of traffic in the entire internet, just because it lets other people post up. So we have to, we have to think about, okay, well, what are the stories that people try to tell? And then I've got new ways of enabling that. And I definitely think emerging tech, and especially from some of the speakers that we've got coming, we will provide really good insights into not just doing what we've done now, a bit differently. But actually, oh, my god, like it never occurred to me that we would be able to have this in a whole new kind of way. Let me think about that, because that's something I hadn't even kind of thought about. So yeah, being in the room, seeing this stuff just excites and ignites your imagination.

Mashhuda: Thank you, Mike. So, I've got some questions for Paul, now. Paul, you served as an Emerging Technologies chair at SIGGRAPH in the past. How have you seen emerging technologies evolve since you were a previous chair between then and now, and what specific trends have you noticed coming through?

Paul: That's an interesting question, right? Because, certainly, there were things you know that I can look back on 20 years ago, that were kind of cutting edge crazy technology, things like, you know, high dynamic range displays, which were shown at SIGGRAPH. And now, our consumer products that you can buy at your local electronics store, right? So it's nice to see stuff like that,



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that there's the clear evolution from the research work to mass commercialization, that is very cool. But there's a lot of stuff, you know, there were early 3d TV systems and things like that, that still, you know, they're not there yet. Right, you know, they have not become mass commercial things. So, so I think there's a lot of stuff is kind of, in the jewels remedy. As far as the things that have caught on, which I think are a little rare to be to be fair, but it's, it's really, I think it is very inspiring, I love by the way, like, you know, you keep referring to storytelling. When I try to explain SIGGRAPH and why I'm involved with SIGGRAPH, to me, it's the conference that is the art and technology of storytelling. And that's how I always describe SIGGRAPH. And I think, you know, storytelling is one of the most profound human activities. It's the way we know things. It's the way we convey culture. It's everything. It's how we educate people, it's, you know, the technologies to do this, we tend to you know, as you were saying before, you know, okay, we tend to think that books and things like that in the past, and then videos. And so yeah, the question is, what comes next? And Etech, emerging technologies has really been a home for these fabulous explorations of, you know, kind of these semi wacky ideas of where could we go, what constitutes ways of storytelling that involve like haptics, and smell and taste and all these things. I honestly don't know which one of those are going to catch on, right. But we have examples from the past, so things that have. So it'd be very interesting to see as it moves forward. I would say one thing that is surprising, I love to see things evolve in Etech over the years, like, for example, this year, right, there was, I believe it was the Sony group that was showing some haptic controllers, that were very clearly an evolution of a series of steps over many years in ETech and have various types of haptic experiences where you throw weights, like so you can feel like one moment, you have a long sword, another moment, you know, it can feel like a ping pong paddle or something like that. Right. And so there's been these years of evolution that really are very nice progression, that emerging technologies that happened and, and I feel like that's one that's just right on the verge of becoming a mass consumer product. So there are examples like that. There are some things that seem to come, you know, in slightly different forms year again, you know, year after year, I don't know when they'll take off. As I said, 3d TV was a great thing years ago. We're all expecting that, you know, didn't really take off the way people had hoped. So it's kind of a mixed bag, I would say, my favorite thing, as someone who was involved with the conference for many years, as not just being somewhat unorganized, but just being on the review team, that you get to see a lot of stuff that doesn't even make it into the conference. And often that's sometimes my favorite stuff. The things that for whatever technical reason, it didn't make it, but you know, and, and you'll often see those things, submissions evolve over years till they get in. And that's fabulous. To see that happen.

Mashhuda: Year, that's a really good point, Paul. So I know that your career has actually involved a significant kind of contribution in emerging technologies, especially around kind of your work in display technologies. You've mentioned one project, very briefly, parallel realities, if you're able to talk a little bit about that project, and, you know, kind of share some kind of ideas and key kind of trends that might be related to that you've been involved in?

Paul: Just to preface it a little bit, this Applied Sciences is the company that I co-founded, it was based off my work at Microsoft Research. I left that company about five years ago, I guess, five years now, no, four years ago. So I am not involved with the company at this point. So I do not speak for them. But I will certainly say for myself, I do think light fields, you know these displays where each pixel not only puts out a color and brightness but actually gets to control those



things at every angle from every pixel, there are amazing things that you can do with light field displays. And it's not just 3d displays, obviously, parallel reality is, you know, kind of using the same sort of light field display as you might use for 3d, but instead using it to show completely different images to every person at a different location. Recently I've been doing some work with trying to improve the look of drone shows. It turns out that light fields apply there as well. And there's some really fascinating, cool stuff you can do. So there's a company I've been working with on that. There's some really nice applications in, in modern moviemaking people have fallen in love with these LED stages. Well, you know, the next evolution of that, you know, there's lots of problems with LED stages. You know, the big one is that when near the actor, you know, they have to create the background from the perspective of the camera. So it's not correct from the perspective of the actor. So as the camera pans around, the whole world shifts in weird ways. And you start to realize, wow, would it be better if like those displays, were light field displays that, actually, so that everybody got a view that worked correctly? And I've been doing some work in that space as well. Because I think light fields are just a very underappreciated all the things that you can do with them. It's not just 3d.

Mashhuda: I really do remember you showing me light field display many years ago at that company. It was amazing. And just thinking about, you know, kind of the potential of talking, going back to digital humans, Mike's work, and Jess is work on kind of like Auslan Alexa, you know, you could customize the digital human, and the content delivered individually for a person at things like airports and things like that in a very, very tailored way. So that that digital human is talking to the individual in the context and way in which that digital human needs convey information using the light field display like that.

Paul: So as you probably are aware, there is a now a parallel reality display installed at the Detroit airport, and the way it works is you scan your boarding pass, and then the big...is yours as you walk around. It shows your particular information, tells you which gate, gives you all these extraneous flights and their info, it's just your info. And hopefully, you know, that could be in the correct language. If it's somebody who has visual impairments, it can be extra-large fonts or whatever accommodations you could make on an individual basis with a display, you could do with that.

Mashhuda: It's such a fascinating emerging technology that can bring in all of the elements we're discussing at the moment.

Paul: I really love, you know, one of the applications we talked about early on, was just doing captioning in theaters. Very simple application, right? So that if you want captioning, you can turn it on in your receipt and have it in whatever language you want. And the person next to you get to choose whether it's you know, that makes a decision independently. They don't have to see your captions. And that's actually very powerful.

Mashhuda: Question to all of you, now: could each of you maybe think about or highlight a standout emerging technologies trend that you've seen recently that you believe will have a significant impact on the future of technology and society?

Mike: I'll happy to bite on that one if you want. Before I do that, I just want to pick on one tiny point that Paul made, which I think I'm sure you'd actually agree with. But it's worth saying, right? Like, if you think about the music, and I certainly love music, right? The music that I really



love, not all of it is like what you'd call Top 40 or hits. And so I think one of the things about emerging tech is, we should also just for a beat, celebrate, the crazy stuff that never will be commercialized will never evolve into anything that is valid just for its own sake, right in the same way that there is like a genre of music that maybe I like nobody else will many people will like, but it still adds value. And so I think there's a kind of a diversity kind of an inclusion aspect of a technological if that's not being provocative of emerging tech that I've always applauded, you know, it's not. And I'm sure you'd agree with Paul, it's not like we're trying to present emerging tech as these are the best guesses at what's going to be commercialized. Wouldn't you agree?

Mashhuda: I agree. Yeah, yeah.

Paul: Yeah. It's funny, because I'm preparing a talk in a couple of weeks, that specifically talking about the evolution of ideas, and how, you know, often these exploration of seemingly whimsical, crazy sorts of things, leads to very profound innovations, like my own work that led to, you know, the early multi touch sort of stuff that I was doing really grew out of work I had done for Disney, making cute little interactive stuffed animals.

Mike: To come back to you, to come back to your question about trends and emerging tech, I'd actually build out from what you were just discussing about light fields because the stuff that's really hot at the moment, just incredibly hot in terms of SIGGRAPH, both at SIGGRAPH that we just went to and the one coming up in the Sydney, is nerfs and Gaussian splats. And so there's a bunch of stuff happening there that also plays into light field type displays, it plays into having very good interactive video conferencing that allows you to really feel like people are actually kind of present with you and make actual eye contact. As we're recording this right now I can look at where you guys are, but then it doesn't look like I'm looking at you. So there's really cool tech in that area. But if you take that even further, but the moment we're at the cutting edge in that area of being able to sort of capture a space, but not really animate the space, capture a person volumetrically with these techniques, but not really animate them. But we know that's coming. And so there's going to be I think a lot of stuff. There was a great paper recently, like where they were looking at taking this and combining it with stable diffusion. And it's these kinds of synergies where you go, oh, hang on a second. They don't seem like a Venn diagram and overlaps. But when you do overlap the Venn diagram, you go, oh, my god, wow, that is just insane. And so to Paul's point, they, they can sometimes be the wacky, crazy things where you go, you've taken what, and you combine that with what? And then when you realize that you go, oh, okay, like that is two plus two, eating a lot more than four. So yeah, I would say that, that area of the technical papers, stuff is now spilling into the emerging tech as people implement and test and come up with crazy ideas. And I just love the crazy ideas. I mean, I got fond memories of going to emerging tech demos where I went, I've got no idea why I'd ever use this, but it's the funniest thing. You've just got to come check. This just brings a smile to my face.

Mashhuda: Yes, definitely. I think we can all think of examples like that, that we've seen at Emerging Technologies, and we've thought, oh, wow, that's really cool. I don't think I'd ever use it, but it's really cool. So SIGGRAPH 2023 celebrated its milestone 50th conference this year. So as we look ahead to SIGGRAPH 2024, and the start of the next 50 years, where do you each of you think that emerging technologies and computer graphics and interactive techniques might be in the next 5, 10, 50 years? I know this is hard, because I'm asking all of you to predict the future. But what do you think the future is going to bring?



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Jessica: So I think based just on the conversation that we've had here, we're probably going to see a lot more of personalized interactions. Even when you're in large public spaces, there's a lot of potential for you know, what you're viewing to be tailored to you, whether that's in terms of language, or accessibility, or even just visual preferences. And that could be quite interesting to see.

Paul: I'm old enough to have seen when I was a kid growing up in the 60s and 70s, people said by now we'd all have flying cars. I think it's a little risky, though. But it was fun, if you go back to the old You Will commercials from AT&T from the 90s. When they talked about it, you'd take phone calls from the beach, and wow, that seems totally outrageous, right? And it's like, yeah, and now we all do that. So basically, people get it right. I suspect, you know, obviously, AI is the big, you know, interesting thing right at the moment. My personal view on it, is that it feels to me very much like the early days of the internet. That there's a lot of hope. And you know, how this will fundamentally change everything about how we do things. And there are a crazy number of startups launching every single day now in AI. And the reality is, the vast majority of those will fail, because that's how the world works. But I do think just like the internet, if you've go back to the the bust of 2000 or so, people used to make fun of this idea of oh, yeah, we're like, we're gonna buy our pet food on the internet, whoever thought that would happen. And now we all buy our pet food on the internet, right? So I expect that AI will play a big role in the future, particularly in the way that we interact with systems that that it will be that ability to personalize and all that is fundamentally going to be driven by you know, advancements in AI. So, so I do see that as being a big thing. You know, just as the internet was a big deal, but it's certainly not the only thing. You know, abilities that we have not planned for that are not on anyone's horizon. You know, maybe that will be you know, jacking into people's brains and directly giving sensation. I don't know, but I bet it will be something that comes out of left field.

Mashhuda: Yeah, yeah.

Mike: But I will say this. I do think that if you want to see what the future is going to look like, look in the labs now. Your best chance looking behind the closed door of labs is at SIGGRAPH. There are a couple of texts that you could bet might come into play and if they did would significantly change what we're doing. Quantum computing comes to mind, and I think that quantum computing could dramatically change a whole lot of things. How, I don't know. But it's plausible that that technology will develop to a point that it has significant impact on applications. When it comes to AI, I think you know, Paul's exactly right, well, of course, Paul is because he's Paul, but I remember going into an early talk that Alan Kay did at Apple, and personal computers came out and and I was just like, I think I don't even I think I was an undergraduate or something. Anyway, he's talked about it. And he said, all people say, you know, personal computers? Aren't they amazing? You know, every home should have one. And he said, that will soon be so hard, as if somebody was to say to you electric motors, they're brilliant. Everyone should have one. I feel like AI will be that. It'll be like we talk about it now, but a few years from now, the thought of just having a discussion about AI would be as odd as saying, hey, what do you think about personal computers? Or do you think you should have a couple more electric motors at Queensland University? So, yeah, I think that'll be a pervasive technology. But I'm certainly not of the opinion that anything's kind of run its course, and in so many of these areas, it can feel sometimes like, well, do I need more power from my computer? I mean, I was talking to a friend over the new announcement of the new Apple M3 chips and



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like, do we really need all that power? And I was like, Wow, you're so sounding like that person that said, how many computers does the industry need? We can predict 500 might be sold throughout America. As technology, and this is the great thing about emerging tech, as it emerges, so too do the opportunities that it creates thus, so too to the advantages and the affordances that it offers. So, yeah, I've never yet gone to a SIGGRAPH where I haven't come away feeling like, oh, thank God, I went to that SIGGRAPH. Because that one was a game changer.

Jessica: Can I just make a contrarian point there, which is I absolutely think AI is going to change things. It's a fascinating emerging tool and technology. We've actually seen a few different iterations of what at the time was called an AI, getting commercially mainstream. And suddenly, we stopped calling it AI because we know what this is, and we know how it works. And how we perceive AI seems to always be oh, it's the next big thing we haven't got there yet, this isn't really intelligent, because in certain limitations here, so I definitely think we're going to see the AIs that are currently making the news now become way more integrated into everyday life for everyday people. But I also think that we're going to move the goalposts on what does it mean for a machine to be truly intelligent?

Mashhuda: We have moved the goalposts on what constitutes AI over the past 50 years, right? As a community.

Mike: I mean, I'm really aware of this from visual effects, right? Like, you go and see people when I went into visual effects years ago, I was like, Oh, my God, that is just amazing. It's the best thing ever. Yeah, of course, by today's standards, I look at it, it looks kind of crude. But back then I thought it was incredibly impressive. Which I guess is also another, I know I sound like I'm just going on about it, but AI is for me a term I don't use very often I normally use machine learning because it's like many of the machine learning applications. Or I'm more specific about like generative AI is really good at doing this or that kind of thing. Because I think you're right, we always want a kind of a newness, and that may get obsolete, right? I come in telecommuting was what was described when I was at university is this thing that was coming, and we never call it that. We just call it using a zoom call. Yeah, maybe it's called artificial intelligence. Maybe it's called something else. Each generation likes to pretend like it invented everything. I'm victim of that as much as anyone. So yeah, but you're probably right.

Paul: I'm gonna throw one other prediction in just for the fun of it. It's, in SIGGRAPH there tends to be this because it is a graphics conference, right? This belief that it's all about the visual interface. I suspect, that is something in the coming decades that we're going to start to realize that our ability to physically manipulate matter is going to be incredibly powerful and change how we do stuff. So I did this project of a little sensor, that was a strip that you could bend to any shape and it would report very accurately, and it's a dirt cheap thing. And it's like, yeah, okay, that's one little piece of the puzzle, right? You know, if you can have matter that you can actually understand it can understand its own shape, how far are you away from then adding actuation that you can do precisely make it into a shape? And then can you add dynamic behaviors on top of that, and, and all of a sudden, you've got like this kind of vaguely Terminator-like thing, arbitrarily configure, you know, physical stuff.

Mashhuda: Physical form, yeah. Wow.



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Paul: I think stuff like that, that's our future.

Mashhuda: That's really interesting. That's definitely a lot more kind of like materials-focused and maybe we should be talking as graphics researchers to to materials scientists as well about you know, kind of materials that can change shape and form and how we might be able to control them as, as an interaction method.

Paul: SIGGRAPH really has embraced rapid prototyping and 3d printing and things like that as a graphics outlet. It's just the next stage of you know, when that becomes all real-time and dynamic.

Mashhuda: Fascinating. That's a really cool idea to throw in.

Jessica: In a similar thought process, I've got to do a shout out to gestural control of machines and computers, obviously very relevant in the sign language space, but there are definitely non sign language applications for gestural controls.

Mashhuda: Jess, Mike and Paul, thank you very much for all taking the time to join us today. We certainly look forward to witnessing the future of emerging technologies in computer graphics through your continued contributions to emerging technologies. I also look forward to seeing most of you, I think, in a few weeks time at SIGGRAPH Asia. And to our listeners, thank you for tuning in to another episode of SIGGRAPH Spotlight. Mark your calendars everyone. We look forward to seeing everybody at SIGGRAPH Asia and we also look forward to reuniting with everyone at SIGGRAPH 2024, 28 July through to first August in Denver for yet another unforgettable SIGGRAPH experience. Until next time, bye!

Narrator: Thanks for tuning in to another episode of SIGGRAPH Spotlight. Stay tuned for submissions details and exciting updates about SIGGRAPH 2024, taking place July 28 through August 1st in Denver. In the meantime, be sure to check out our website for the latest information by following the links in the show notes. Until next time!