Vicki Sowry: So we’re really thrilled to be able to invite Ariel Bogle here today. Ariel’s a technology reporter at the ABC and she writes, edits, and makes radio about technology, policy, and culture. Most recently she was technology editor at The Conversation and her work’s been published in The New York Times, The Atlantic, The Australian Fin Review and Slate, among other publications. So I’ll now hand over to Ariel and she will introduce our guests and I hope you enjoy the conversation. Thank you again for coming.

Ariel Bogle: Thanks, Vicki. I am really thrilled to be here and talking about emotions and robots and all those good things with this great panel and just to get some of those formalities out of the way I’ll introduce them all. To my right is Dr. Wade Marynowsky. He is an artist, academic, and researcher working across robotics, immersive and interactive performance, and installation. And his main body of research explores the notion of robotic performance, agency by challenging notions of classical spectatorship and performance. So we’ll definitely be talking about that. Dr. Belinda Dunstan is next. She is an academic at the UNSW Faculty of Built Environment and a member of the UNSW Creative Robotics Lab. She is an artist, researcher, and lecturer in the space between art, design, and technology. And her current research interests are in social robot morphology, technology, ethics, and responsive environments. And then to her right, Professor Mari Velonaki is an artist and researcher in the fields of social robotics and interactive media art. She is a professor of social robotics at UNSW and she is the founder and director of the Creative Robotics Lab at UNSW and the National Facility for Human-Robot Interaction Research. And finally, Justin Harvey is a Sydney-based artist working across moving image, sound, and installation. And his solo work present abstract expressions of interactions between artists and machine exploring unintended beauty in the breakdown of the digital image.

 So that’s our illustrious panel. And we will, I think, keep it very informal, as Vicki said. We’ll talk for about 40 minutes and then open up to the floor for questions. And each of these artists will also be talking through some of their works are part of the conversation. But one thing I wanted to start with, I don’t know if anybody in the room has ever done training for social work but there’s an exercise that’s often implemented and basically you’re asked to draw sort of concentric circles. You have the central circle and in there you put the people you’re closest to. Your family, your closest friends, your partner. Then the next circle is work friends, people you might be on a sports team with. Then it goes to those everyday interactions which do add something to your life. Maybe your smile with a barista, the barista that knows your name, maybe the guy at the gym that you partner with. Then the final circle is people you pay to hang out with you. Your doctor, maybe your masseuse., if you ever get a manicure you’re paying someone to have a human interaction with you. And I thought maybe Belinda we could start there. When we’re thinking about emotionally engaging with machines, which circle are we thinking about?

Belinda Dunstan: I missed that joke.

Ariel Bogle: So did I, but go ahead. I was just thinking about when you’re thinking about all those circles, where do robots fit in?

Belinda Dunstan: Yeah, great question. Sorry, microphone struggles. I feel like the public perception is that robots may end up occupying that innermost circle. Either that one or the people you pay to hang out with you circle. So either people might see them somebody who lives in your house and is very close to you or a service robot who works in a hospital. But actually what we see in research is that I think increasingly social robots are going to occupy all of these different periphery circles and I’m going to try and show a couple of videos today of robots that might just be the co-worker that gives you a high five on the way into work or just those small little social interactions that we have. I think they’re a lot less binary than we often think they might be.

Ariel Bogle: Mari, you’ve worked especially with robotics in aged care, which I think is something the media has really grasped onto as a way to understand social robotics and the way they might fit into our lives in a non-drone warfare type of way. Would you walk us through what that looks like?

Mari Velonaki: Again, it was aged care and it’s a very sensitive space. So the first thing that comes to people’s minds if I say robots in aged care is like a metallic boxy looking robot approaching a fragile lady instead of a nurse. So this is the scenario we have to avoid. So the aged, our nursing home of the future for me is a place that technology doesn’t replace people, enhances interaction between people. And I know it sounds like an oxymoron. Why do you use technology to enhance social interaction? Well, in the 21st century, prevent accidents and wellbeing, you know, assist wellbeing. But most importantly, for someone who comes from art and design, enhance interaction if you need to interact with technology. And it’s not something only for young people. There’s something interesting if people can start playing again with technology and there’s no social stigma attached to it if they don’t perform like a teenager. So that’s the kind of future I’m interested.

Ariel Bogle: So Wade, I think, too, there’s a lot of polarising emotion when we think about robotics. You know, will they love us, will they hate us, will they dominate us, will we dominate them. I think your work has focused more on, I don’t know is whimsy is the right word, the uncanny, the humorous. Can we move away from those really extreme, polarising extremes that are really in the movies or in media reporting?

Wade Marynowsky: Sure. So there’s multiple kind of themes that I’ve been exploring. Perhaps humour and sort of intimate interactions where people can experience robots in a gallery context up close, they might talk back to them and move and create gestures, which allow them to get feedback from the interactions with the audience. I guess I could show a photo of the particular work called Robot Opera. So here I’m playing around with some of those menacing themes, that the robots will take over the world in the context of a performance. And I guess this is a more of a playful interaction where the audience is trying to work out what the robots do in response to their actions. In the context of the performance space and a performance context, it’s durational, it’s musical, it’s interactive. So they have some preconceived notions of how they might be able to perform as a part of the performance kind of, in the performance context. So there’s a beginning and an ending, a dramatic arc, you might think of that. You might think of it in that way.

Ariel Bogle: And how are you hoping the audience feels, I suppose, after engaging with your robot?

Wade Marynowsky: So sometimes, I mentioned Deb, over there, she’s described to me one of the robots actually scared people. This one. It’s called the Acconci robot. It only follows you when you’re not looking at it. So when you turn around and look back towards it, it stops. And Deb told me about when it was exhibited at the Powerhouse and two young people were unawares of how it should interact with them and then all of a sudden it started driving towards them and that totally scared them. So that’s an element of the uncanny or an element of surprise and fear. But if you’re experiencing these robots you can have a sense of… because they’re so big and menacing, coming towards you, there’s a little bit of a frightening element. But because they’re dressed in cloth and spinning, there’s also an intimate, there’s a breeze, there’s some sort of presence. I guess what we’re talking about is embodiment.

Ariel Bogle: Justin, your work, you’ve really looked at the smart phone in many aspects and I think some of your work really gets into this notion of finer inspiration. I don’t know if you’d call it robotics, maybe AI. But you had a work where it interpreted non-textual, you got Google to interpret non-textual images and derived inspiration from that. How does that fit into these other interactions of, I guess, when these systems can provoke inspiration rather than a more serious emotion?

Justin Harvey: Yeah. So I was really interested I guess. So I have a background in kind of glitch art, so all, you know, those unexpected breaks in the machine or software that we all, I’m sure, have experienced. And so I was interested when the Google Translate app came out for smartphone and I found that by pointing it at kind of non-textual things you could kind of force it to translate non-textual imagery into this kind of ephemeral poetry. So I’m kind of… no, that’s not it. That’s another one. I’ll put… up the top moving there, it’s a kind of…

Wade Marynowsky: This one?

Justin Harvey: Yeah, that’s one of the iterations of it. And I just, I kind of found it fascinating… you can probably mute it. It’s… you don’t really need the sound. So, you know, kind of this idea of an interconnected world and Google moving to the neural network way of translation from statistical machine translation in 2016 enabled it to be much more powerful. And this idea of kind of bridging those gaps in language in the more kind of global with, you know, the way that AI connects us, internet and such. And so there’s this kind of fanciful ideas of translating the clouds, you know, on your way to somewhere different and what kind of ephemeral poetry is kind of created by that. So it’s about the unintended use of this for kind of fun and even though it’s a really useful tool, like I had a tradesman at my house last week and we didn’t speak the same language. So like Google Translate was vital to like bridging that gap between our interactions so we both knew what was going on on the side of the house. So this kind of, you know… I’m interested in kind of the different ways, the different ways that you can kind of break or play with kind of these algorithms that can be really useful.

Ariel Bogle: How does the fanciful fit into your work, Mari? Do you…

Mari Velonaki: How does (?)?

Ariel Bogle: How does the fanciful, the accidental, does that figure into your work as well?

Mari Velonaki: OK. My work there is kind of accidental. Sometimes when you develop a robot, it doesn’t matter if it’s for a cultural purpose or application for industry, for museum, you discover something as the robot’s behaviour developed that is interesting, that you didn’t expect. And that’s positive. Like the element of surprise is extremely important in our interaction with robots or anything, really. There’s another element though that you can’t predict. When you don’t predict what exactly is happening, you don’t understand the system or think it’s highly problematic. So it’s a very fine balance between an element of surprise in the behaviour of a robot that I think is essential, especially as robot, social robots progress for long-term interaction. You need something interesting. If it’s boring it’s going to be another overpriced gadget, right. It needs to develop, to learn, and to surprise you. But it’s a pleasant surprise. If the system fails, if the chronological apparatus fails and the operation, you know, you can’t follow what this thing is doing, then it’s highly problematic. And it does happen when you develop something. We call it teething problems and it happens with every single project. Like Wade was asking me, what about your new project for Japan, the new robot? And I said, yeah, this is what is not working. So this is not fanciful. It’s not a new behaviour that you haven’t thought. It’s not that you develop something in your art element or you extracted elements and it’s better. It’s something you still need to solve.

 And just one thing dealing with what you were saying before about will the robots take over. I think there’s a big difference… robots are very fragile. So people… that’s one thing about AI and the things you don’t see that can happen very fast behind the scenes and then they embody things. They move around and take place. And also, you build something that is embodied and it needs to move from here to there, it’s fragile. It requires a lot of work. And they’re not going to, I mean in our lifetime, they’re not going to take over yet. I don’t know about the next generation.

Ariel Bogle: Oh yes, absolutely. But that is a good question. Because I mean obviously there’s a difference between the embodied robot and the, and an AI system that has no body.

Mari Velonaki: Much faster.

Ariel Bogle: Yes. Well, there is a growing conversation about people building systems that they don’t understand. So machine learning systems, some people refer to them as black boxes. They start to see signals, make decisions that the process of getting to that end decision is sort of opaque even to the person that developed the algorithm. So I wonder if you’re thinking about this at all in terms of when you’re building in social robotics, making sure that you understand every movement and decision the robot makes, whether there’s a gap between that and the element of surprise that Mari was talking about?

Belinda Dunstan: That’s a really interesting question. I brought a couple of videos to show you. I… most of the people on this panel I think use robots in art, whereas I’m really interested in using the methodologies and theory from art to approach robotics research. And in doing so it kind of flips traditional robotics methodologies on its head. So usually in robotics you think of the application and then you find the hardware and the software and that kind of thing and then eventually maybe put something aesthetic around the outside. Whereas I think… and in doing so I think the nuance of movement and expression and particularly emotional expression is often lost. And so I’m really interested in kind of going the other way and thinking about movement quality first and the appearance of the robot first and then working backwards from there. I brought some videos to show you. I think the thing that illustrates my point the best is actually, it comes from the work of some students. In 2017 I wrote a course for UNSW, it was called Social Robots Movement Design for Human-Robot Interaction. And what I’m about to show is some videos of the work that proceeded from the students.

 It was just a two-week intensive course. And in this course, I actually had one of the students who was here, they were incredibly brave. I turned up to class, it was a robotics course, and I brought a bag full of recycled milk bottles, some tape, and some string, and I said to them, I want you to make a robot that expresses joy. Here’s your milk bottle. And you, can you make a robot indicates it’s apologising? And these students, these are art design kids. They sat there and they looked at me for a second, like OK. Yeah, alright. And they just got to it. So this is what they came up with. Let me just see if I can get this full for you. Here we go. So they firstly just began with some movement experiments. And they were just looking for emotional pivot points in the milk bottle. Some of them quickly discovered that different types of milk bottles had different little physical qualities that they could capitalise on. And particularly with the carton milk bottle, they discovered it had little ears that you could prick up to pay attention or maybe kind of flop over to show some remorse here. And even quite a distracted expression like awe. And this student in particular even got it to do a little happy dance. It was very sweet.

 So we first got them to puppeteer the movement and just kind of map out the expression we were hoping to achieve. The next day I gave them a single server modo just to hook up to the strings that they had been using. And you can see, this is a Dare ice milk bottle, but immediately there’s just this beautiful affective breathing motion. They were fantastic. None of these students had ever used electronics before and they just, because we went sort of material first they kind of came up with these fantastic expressions. The second video shows the second task where we asked them to get the robot to respond autonomously to the environment. So at this point they were embedding small little sensor motors into the robot to have it respond to the environment. Whether that was through sound or proximity or movement around the environment and this is where they just kind of, they took a lead from the materiality of the milk bottle and added just little elements. For example, in here they just added a single oculus to direct the attention of the robot and it ends up with these really, really kind of affective, expressive outcomes. And they found that actually the morphology of the robot, the materiality suggested applications that, they suggested that you might make a robot that listened to your secrets or just sits by your bedside table.

 This one ended up being a companion, little companion robot. And you could it secrets and it would prick its ear up and respond to the microphone that was inside the cup here. And the students really… we had another student, Michael, who got really interested in recycled plastics and just taking that very artist-like approach to rethinking materials and how you could capitalise on the basic movement that was in these recycled snakes to get a really expressive movement that was sort of like a biomimicry how an underwater creature might express, you know, their response to some danger. So this for me was fascinating. These are the robots enjoying each other’s company in their downtime. They got very excited at different points. But of course, newly endowed with sentience, loneliness is never far away. They’re very sweet. So for me, this is, in response to your question, these… taking this artist-based approach, a material approach means that they began with the interactive element. They began with, how does this make me feel? How do we get the expressive part first and then work backwards from there? And then you can go to hardware, software, whatever. But you’re not sort of trying to achieve interaction in an ad hoc manner.

Ariel Bogle: Yeah, they’re great. I guess they remind me immediately of the cast of the characters from Beauty and the Beast, the living candelabra and the living cabinet. Like that. So I wondered if any of you had any thoughts about that too, where I’m curious about when you’re thinking about how to embody your robots where you go to first to find inspiration for those bodies in a way that you hope people with interact with them in a positive way.

Mari Velonaki: You have to be very careful about the positive way because we’re artists and researchers. So positive is not necessarily always positive. That’s the beauty between the work that we’re doing… engagement is one thing, positive something else.

Ariel Bogle: Well, in the way that you want them to…

Mari Velonaki: So because we’re not product designers, although we work with industry, like we don’t, we don’t want to make something that is likeable all the time. We’re interest what’s happening in this space of interaction. People, robots. A successful robot for me, something that creates a reaction from people. Could be positive, could be neutral, could be negative, could be repulse. We’re learning through repulse. And this is wonderful of doing research in the field, we can publish and we can talk with our friends and we can see this is the bad robot and… yeah, Diamandini, yeah. The Diamandini, for example, because that’s one, the first and only humanoid robot I designed. So it looks like a sculpture. My previous robots and my next one, they’re not anthropomorphic. And she is 155 centimetres tall. She looks like a porcelain sculpture, she will use composite materials. And some people love her and adore the fact that she moves like a sculpture. And some other people like, especially older people, feel that she’s a ghost and they freak out when they see her in museums around the world. So it’s a mixed responses.

 We put some sensors in the hard shell of the Diamandini that has a person-like feeling to see where people touch. We got, from the Victoria and Albert Museum alone we got 37,000 interactions of people. Most people do head and hands. Children, people that when we look at our data, and we have to be very careful if this is a short person or a child. Because even if you have an automated data classification system you still have to do the old world, kind of old way of looking at your videos and see, OK, it was a short person who is not exactly a child. But they would touch different parts of the body and push around. So I think there’s something very exciting about… we don’t design, at least I mean I know very well Wade, my wonderful friend and peer here, and Belinda’s work, and I know that they don’t, they don’t… we don’t… we design to engage. We create to engage not necessarily to please. A lot needs to be learned during that interaction that can inform how we design and conceive future robots.

Ariel Bogle: Yeah. Well, I guess I was wondering to provoke the reaction that you are after or not, just wondering where you find the inspiration for the movement from. Is it from other art? Is it quite functional?

Mari Velonaki: No, no, no, no. I mean every artists is… that’s the beauty. Social robotics, I have to say, I’m the mother of social robotics in Australia, I started the field in 2003. So the only thing… there are 99.9 things I don’t know and there’s 0.1 I know and that’s social robotics. So it’s by definition multidisciplinary. It is not, it’s not because it’s interesting or politically correct. It’s essential that artists, especially media artists and designers that work with interaction design, have a saying, when this robot, it doesn’t matter if it’s for a gallery or for a nursing home, are engaged. Because we’re the only group in the world that we have the longest history between systems, spaces, and people, audience, outside of the labs. So yeah. So that’s what we’re… yeah, no, no. It’s OK. That’s the Fish-Bird robot. Right.

 So the inspiration, for example, the Fish-Bird robot, it’s the first robotic work and design, 2003. It was at Australia’s Centre for Field Robotics and it was funded by my first AOC grant. That was… one of the partners was the Australian Network for Art and Technology, amongst the MCA and Artspace. What I’ve learned, what we have learned in this work has been exhibited in 13 countries and to date it still runs. Every year it’s been a different part around the world. We developed the longest collection, data collection with over 674,000 interactions. So we actually give data to research centres around the world to analyse because we don’t have the time, the personnel, the researchers to do it ourselves. The one thing that we found, it’s about one of the most important triggers for communication is movement. Really archaic interfaces movement. You share a physical space, they move, they move. You can communicate so much with movement. And I think what Belinda was showing with the students, it’s some really… you know, I didn’t discover that movement but I know that you can create a character using… you can use another car, the wheelchair is another physical avatar (?) to create the character. Because if they feel scared, they go into the corner. If they want to interact you change the speed and the approach.

 So most artists work in this way when they design physical kind of performative behaviours for robots. The hardest part is to make something look fragile. The hardest part for us in Fish-Bird was not to do the, you know, choreographed stuff but how do you make something to look super fragile and slow and move and be aware of what people are. And I think this is, movement… movement, movement is, it’s so important. And every project is different. It’s not only inspiration, the situational context. Because your inspiration maybe is irrelevant for that audience that you want to… of course we’re inspired, we’re inspired about agents, characters, operations. And then we think about these characters and how do you assign movement to them? You know, it’s… and the way we’re all inspired, I see so many of my amazing, talented colleagues in the room for many years and we get inspired by many things. I don’t think… now I’m thinking of this movement. But like when you assign a character, is this shy? Is it extrovert? Is it introvert? Like Wade’s work, you know, maybe you can talk, I should shut up now, about the movement, especially the movement with the…

Wade Marynowsky: I was just going to add one thing that I think obviously light and sound are the other interesting or additional components which can provide feedback to your audience member. Because one of the main questions that audience members might come up with during their interaction is, does the robot know I’m here? And so how does, how do you give that feedback to the audience member? We’re not… just say for example, I’m an autonomous robot moving around and I see a person and then I just move away. And so the person thinks that, oh, you know, they make up all these suggestions in their own head that the robot was responding to them when in fact they were just autonomously doing their own thing. And I think that’s why I came up with a narcissistic robot concept and perhaps in the future robots will actually not care about humans and just do their own thing. And this is where AI and behind the scenes kind of software will actually be performing in that context.

 But getting back to my point. The point is about when you can give auditory feedback and actually have a conversation, natural dialogue, is a really high research area for AI. And when computers, robot, AI can actually speak back to you, that’s going to be a major turning point.

Ariel Bogle: Sure. I think you were talking before about people who interact with some of your work really feeling like they were the centre of the robot’s world or wanting to be or assuming they were. Is this what you mean when robots may not think of you as the centre of their world at all?

Wade Marynowsky: Sure. So I have five larger than life size robots driving around in dresses. People thought they were Dalek’s in drag. There’s this notion of camp as well, which… so robots are trying to be human-like, whereas in camp they’re trying be either what… either other gender. But when… this one person commented that they thought they had ESP and that they commanded the robots to surround them. So they… because they were just standing in the space and all of s sudden all the robots came and surrounded them. So yeah, there was an unnerving experience there that they were being attacked by a swarm of robots from the antiquities. They were stuck in some *Doctor Who* film perhaps.

Ariel Bogle: Yeah. Well, I thought I’d take the opportunity to ask. I know a lot of the people in the room are probably artists, too. But I did wonder if someone, not an artist, just looks at art, what do you think of all of the carriers (?), Justin, in between… for your work, what do you see the role of the carriers (?), because it is such an introduction for so many people to, quite radical ideas about machine-human interaction.

Justin Harvey: Yeah. So a lot of my work is actually screen-based, so it’s quite traditional, traditionally presented in a gallery. But I’ve been doing some VR, some cinematic VR lately. So that’s quite an interesting experience in terms of connecting to a machine. I know it’s not a robot. But it’s kind of, you know, it’s a virtual, putting yourself in a virtual space. I was in ICO in Korea earlier this year and there was a lot of media art around VR. So there was a lot of little cubicles with goggles in them. And I find that quite an interesting space to be working in. And also I think it provides challenges for galleries in terms of how to display these kinds of things. Even the AR. So if you’ve got augmented reality, so you know, that is triggered by an icon on the wall, for example, and it creates a layer of augmented reality over what you see in the real space. Yeah. I’m probably not as well-equipped for that question in terms of robotics. But I do think it certainly is a challenging thing for galleries.

Ariel Bogle: Does anyone else have a feeling about that or how you use the gallery as a sort of interface between…?

Mari Velonaki: For us, the… we have the lab for testing and then we have the new National Facility for Human-Robot Interaction Research, which is a state-of-the-art testing space. The only one in the world. Over 273 sensors, unobtrusively (?), we get the most complex dataset for human affect and intent, robot analogue (?) in real time. Amazing. I love gallery spaces, I love museums. You know, we need them. We need cultural spaces to test the things that we create. We need the labs to go back from what we’ve learned from society and make sure that they work, right. But you cannot… to me, it’s like a learning space. Every exhibition, every country, different populations. They’re so unique. Unfortunately not every single project that we have, it’s appropriate to install in a gallery space. But it’s much harder to collect data in a gallery than in a kind of super, you know, state-of-the-art design space. But it’s so engaging and it’s so wonderful. And it’s such a, such a fair proposition. You take your work out to the world to love it, to hate it, to ignore it, to kick it. So to me, galleries, cultural spaces for all researchers, they’re ideal spaces to engage the public to have a saying about this creative or non-creative, the chronological systems. So I think they’re very important.

 Now the one thing that we have to be careful is like with our work specifically, like one project I think it was five years, the new robot that we do for Fuji Xerox in Japan is another four, Fish-Bird was three. The hardest part is you work in a research environment or a studio to create something that behaves like a product. Because once you ship something to the other side of the world and the museum has rented out, you know, chose it for three months or six months, half a year, they expect it to run… the only thing I’ve learned is like around the world the technical support people in museums are overworked and underpaid. So the worst thing, if you want your work to, you know, be functioning, it has to… you have to pay attention to the interface, to the very simple, we do very simple analogue interfaces that is a switch that the whole system runs and then at night-time shuts down by itself. Because museums are, you know, hardcore testing grounds.

 I speak to people from Defence, all sorts of industries, and I said, if you want to test something, put it in a public space, right. It’s really hard. I agree. So most of the time you need to fix, it’s in a lab, it’s very safe to test something. In museums out there, so very precious spaces. And we need to treat them also with care because if something fails it’s really bad for our field. You know, the thing that didn’t work. So it’s very important to produce things that they run and it’s easy for the people to maintain.

Belinda Dunstan: I agree. I think that gallery spaces kind of bring an informality to some of this technology and make it a really accessible thing and that people kind of interact with technology they wouldn’t ordinarily see. And perhaps break down some of those really siloed binary conceptions that are perpetuated by the media. But furthermore, I mean Mari, you always taught me, if you really want to see how something runs stick it in a gallery, because most of the robotics papers that you read, like a research paper, it says, yes, we tested this with 50 ordinary citizens that are all second year MIT grads or something like this. Like your very standard, very narrow kind of socioeconomic group. Whereas, you stick it in a gallery and that’s where, you know, that’s where the real, the real deal go to hang out. So I think if you want an honest response to your work, if you really want to know how something works with many different types of people, the gallery space is it. And I think that it’s, it is providing that really interesting space for people to encounter new technologies like VR and MR, which seem completely abstract in the media sense but kind of tangible and approachable in a gallery space.

Ariel Bogle: I also wanted to talk about nostalgia. Because obviously the, your students, milk cartons immediately reminded me of a film I’d seen in my youth, you know. I think Wade, some of your robots, you’ve directly played on the idea that people would feel familiar with a robot maybe because it’s wearing roller skates or something like this.

Wade Marynowsky: Yes. My current project is robot roller skates. It’s called The Robot That… sorry. The Ghosts of Roller Disco. So you might recall as a youth perhaps you went to a roller disco and…

Mari Velonaki: Yeah.

Wade Marynowsky: Now they’re autonomous and they’re driving around and they’re swarming around you and they’re wondering why you’re not roller skating anymore. This is the idea, if it works. So previously the works have been quite large and coming towards you, scaring you a little bit. And now I want to tap into some nostalgic references and make them cute to enable, I guess, an association and a nice friend rather than a scary beast.

Ariel Bogle: And Justin, does any of your work sort of play on nostalgia? I guess when I think of glitch art or, you know, exploring those breaks in the machine, I mean machine’s still break, but now the smartphone is such a sleek, it’s more or less frictionless technology. And when I see your work it really reminded me of my early experiences with smartphones. I wonder if that plays into your thinking at all?

Justin Harvey: Yeah. You’re right. The errors have been absolved and yeah, it’s super slick now. And you don’t even really notice what’s going on. A lot less than you used to, which, yeah, I don’t know what to say. I mean I’ve got an old work here that I could show you, which is, which kind of is kind of where I started I suppose. And it was a very domestic kind of space and it’s kind of this, you know, the kind of the vision of my baby nephew was distorted by an app that kind of broke. And I just kind of layered it up with my other nephew kind of signing in the bathtub and it kind of, it kind of was meant to be a bit scary. And it was scary at the time.

[VIDEO PLAYS]

Justin Harvey: It’s just this kind of idea of the innocence and the way that the kind of image of themselves I suppose was being distorted before like he was even really aware of himself. And so I, you know, I kind of oscillate a little bit wildly between the binaries that we were talking about right at the beginning. You know, between like they’re taking us over or, you know, they will destroy us all and kind of just it’s a little bit of fun, you know. So yeah.

Ariel Bogle: Well, I think we’ll go to questions in just one second. But I did want to get back into one ethical question before we pass to the audience. And it’s this question around when we’re making robots for human interaction, the scenarios that are really explored right now, as we’ve mentioned, is aged care, childcare, maybe medical scenarios in hospitals. And I’ve heard the argument from some in the public that they feel that we’re only… put people in direct interaction with robots if they’re sort of, not second-class citizens, but groups of people that we are willing to allow a robot to replace a human. People that are old. I mean we’ve just had the Aged Care Royal Inquiry here in Australia, which really exposed how badly we treat old people. And the argument would be, why would we inflict robots on them? And I wondered how you think about that question.

Mari Velonaki: OK. If we have almost the Geminoid, is this an image of the Geminoid… so this one.

Wade Marynowsky: Yes. Yeah, I can’t work around that.

Mari Velonaki: So… which one is it? I think it’s the one with… yeah. Yeah. So this is, this is one of the android robots that we’ve been testing in the lab. I’ll tell you one thing. The worst thing that can happen to us is to continue crating robots to replace us or to look like us. I don’t believe, I don’t believe in evil robots or evil AI. I think it transfers the debate… it transfers the responsibility of us as a society, what decisions do we make, because these things are not developed by themselves, including the black box. One, they like, you know, these algorithms don’t wake up. So we have a party and be wild today and we’re going to hurt humans. No, it doesn’t work like that. So I think for us to take, our society to have a think… first, the multidisciplinary we have been, you know, trying to push for years. It is important. Everyone around the same table when we develop new technologies. Not only artists and designers and social scientists and AI experts and mechatronics. Ethicists. I would like the ethicist to be engaged at the very beginning, not to come in at the end. I think the societal interaction is important to make decisions. They’re there for the benefit of society. Maybe to a new age. We cannot be 100% there, but we can try to be a little bit better.

 Now the nursing homes, to have… there’s some great projects for nursing homes and I’ve seen some really bad ones. Like for example, with the Geminoid there for the first, probably the first android that I designed in [indistinct 42.53] in 2006, the year my daughter was born. It’s a really bad example because for people in, you know… yes, they get, they want to engage. But usually in nursing homes you have people where the sensory interface is not, it’s not 90% or 100%. So we run the risk of having something there, even if it’s for entertainment and engagement, I’m not talking about deep interaction or medical attention. But that they think interact with humans. So I think this kind of relationship of replacement is the worst thing that we can do. Use technology to enhance the human experience. Like we’re working on a project about mnemonic devices. It is, it is about human dignity. It’s about trying to work with whatever is left in someone’s memory to empower that person versus having a robot to say, hi my name is Mari, I’m really nice, I’m your nurse, I love you.

 And what is, it’s a bit of a film scenario, underestimating human intelligence. You know, we’re not stupid. I don’t want a stupid thing coming around and pretend that it’s a nurse or a human. But if I cannot have other humans I can have a network of things that connect me with other humans or sensory interfaces that make me feel better because I feel safer. And maybe I can be a little bit, you know, more independent or independent for longer to enjoy my own, you know, life in my own home a little bit longer. And you know. So I think this is a debate that it’s not just social robotics or art and science or… it’s all of us. Like we have robotics, sensory… why we have to be so boring and make another pseudo-human?

 You know, there are also some very good robots. For example, in New South Wales, and I’m sorry I can speak only about New South Wales, like 80% of the nurses that work in hospitals or nursing homes have lower back pain because it doesn’t matter what you use to transfer bodies, it doesn’t matter what’s the current technology, at some stage you’re going to hurt your back. So I’ve seen Japan have a robot, and Japan actually, because of the Japanese society situational context, look like this crazy anime character. Very soft and big. The person is there to engage the human. That’s what we can do best. Mrs Smith, sorry, Justin, now we’ll take you to the operation, I can’t carry you, I cannot put you in the stretcher, but this… you know, so the robot just holds people while the human is still there. And the robot doesn’t look like a human. And I think for Australia maybe these cartoon characters wouldn’t be the best choice. But I think it’s our job as society, not as a field or as university or, you know, to find ways to utilise technology for the benefit of society.

Belinda Dunstan: I agree Mari. I think arguably the humans that we currently put in charge of some of the most fragile or at-risk groups of people are also the most overworked and underpaid of many occupations. So that is currently the situation and I think in robotics, as Mari has said, it’s moving towards a robot that replaces these hyper-mechanised movements that these humans are having to do over and over again and returns the human to the most human part of the job. So they can hold the hand of the patient while they’re being carried by this robot and it prevents them injuring their back and returns them to that really kind of ethical human side of their job. So hopefully we see this kind of collaborative approach to robotics in that area rather than the replacement one, which is kind of talked about in the media. Yeah.

Ariel Bogle: On that lovely note, should we open up to questions from the audience?

Audience member 1: Hi everyone. Thanks for much for a great panel, that was really interesting. I just have a question around the role of… if anyone on the panel has any comments to make in the area of I guess how robots can potentially fill our extinction gaps.

Mari Velonaki: Identify extinction. What kind.

Audience member 1: In the more than human space. So one I can immediately think of is the role of robotic bees to, you know, play the role of pollinators. But perhaps sort of, you know, future casting that a little beyond the robotic bees. What sort of sociality in the more than human space and what potential robots have for filling that extinction, those extinction gaps that are widening?

Ariel Bogle: Are you thinking like a functional extinction gap… like bees I suppose, but there’s also a lot of coverage at the moment I think of the loss of birds, which obviously have an effect on the physical landscape. But it’s also an emotional thing. I think here in Sydney we are surrounded by bird life and that would really tweak with our emotions, with our emotional relationship with our environment. So I wonder if robots could step in there to build on that question.

Mari Velonaki: Well, my personal belief is that they shouldn’t and it will be a very bad alternative. It would be really sad if you have something we’ve kind of got flying around replacing a real thing. I’d rather have an incredible VR space and a great sound installation and then where it’s robot coming in, that it’s not a bird and something crazy, and it smells like the countryside. And I will feel much better. Still, I think it falls into the category of replacement. You know, taking… the bird is not there, oh have a mechanical bird. I think in the near future, not robotics but other kind of disciplines will create this kind of artificial life. But it’s not going to be the robotics domain. It’s not going to be still analogue and digital all together and mechatronics. They’re going to be different properties there. [indistinct 49.00] prediction.

Wade Marynowsky: Furthermore, I see it as more of an assistive technology. For example, you might have underwater robots that can analyse and, you know, perhaps kill starfish or predators or clean up pollution. You know, autonomous vehicles in the sea perhaps cleaning up oil. I think that’s more of an assistive approach to save any extinction happening before it happens.

Belinda Dunstan: And I think projects like that happen at the moment. Australia is the world leader in field robotics. Particularly at Sydney University. And even in that agricultural context they’ve found, you know, that using robotic assistance can optimise water use in plantation or that kind of thing. So I think that more than directly replacing maybe animals that are going extinct or things like that, that we can actually have a proactive approach to using robotics to, as you say, clean up oil or optimise a really small amount of water or whatever it might be.

Mari Velonaki: At the, my other home, the Australian Centre for Field Robotics, I’m a (?) professor there. I’ve been there for 11 years. My colleagues, like Stephan Williams, they’ve been developing for years all these autonomous robotic systems that monitor the Great Barrier Reef and they report on changes in both plants and fish. So I think that’s wonderful. They also do a lot of work about, in archaeological sites around the world, discovering like lost civilisations but also for things that cannot be fully kind of emerged from the water or taken out, what is the state and how long do we have until we have solutions. So there are many, many places that robots can go where humans cannot. And another area, it’s still within social robotics, it’s not a… we don’t do that kind of work in this group, but it’s like rescue robots. You know, you have an earthquake, extreme conditions where humans cannot go. Robot can go. In our job, we create interfaces. So when the robot is there, we create interfaces so the robot can communicate with the human, with the person in distress about, that’s OK, someone is coming.

Belinda Dunstan: Reassurance.

Mari Velonaki: Reassure them. And I think that’s… we can all use our toolbox of skill designing for people, responsive environments in improving that interface.

Ariel Bogle: Great. Any questions?

Audience member 2: Hi. We’re not just talking about robots and machines, we’re now talking about something that has intelligence. So I was wondering what is the ethical framework that now fits around that?

Belinda Dunstan: Yeah, that’s a really great question. At the moment in robotics there’s no robots that are at the level of sentience or emotional intelligence that that Hollywood would convey. In robotics, I think we can just think about intelligent or emotional expression as just being states of being or expressing intent for action or to further some dialogue or that kind of thing to encourage further interaction with a human. That’s really what emotion represents in robots at the moment. But if you’re interested in this topic there’s an amazing book, it’s called *The Machine Question*, written by David Gunkel, and it actually is kind of a follow-on from a book that was written about 50 years earlier called *The Animal Question*. And this book was written in relationship to when we rethought legally the status of animals. And there was a point in time where animals really had no rights and no consideration and we didn’t think of them as worthy of legal or ethical consideration. But when we realised that we couldn’t measure whether they had sentience or not but the performance of sentience was enough, that actually yes, they do deserve ethical consideration and it’s as much about the humans as it is about the animals. And that, we have completely, you know, done a 180 on our ethical consideration of animals just in the last 50 years I would say.

 And ethics, as we know, is fluid and responsive and must continue to turn over. So no doubt the future of robotics will invite a lot further ethical consideration. But I think that it might head towards a similar territory where the display of sentience is enough to deserve ethical consideration if not just for the human counterpart and how they behave in relationship to something like that.

Vicki Sowry: We’ve got time for one more question.

Mari Velonaki: Sorry, I just want to comment on that.

Ariel Bogle: Go for it.

Mari Velonaki: Yeah. I just wanted to comment and that was a great question. Like when you start with AI, it’s extremely important for a robot in order to be used to be able to learn and produce some sort of interesting kind of responses to you, if it’s long-term interaction, if it’s not something you see in a gallery for half an hour. So it’s like a square that you have to build on and then different things are developed. So I’m not concerned about that because even when we talk about, as Belinda said, emotional state, that’s in quotation. Robots don’t need to take over or AI doesn’t… that’s a human need and that’s what we protect. Something that I’m very, very concerned is about this AI decisions that, you know… like I was involved in some sort of consultancy about autonomous driving and legal cases and us, you know, the new Teslas in a few years from now, they collaborate with either and, you know, you can rent out your car to come and pick up someone. What this decision mechanism in real time, extreme scenarios, how the problem will respond, it’s, to me, this is a little bit of, a lot of, you know, serious consideration, not a little bit.

 So for example, if it’s you and your child in there, in the car, but the three kids are crossing over the street, what… usually in AI you say you save the largest, you know, the more fragile kind of members of the population, frail and numbers or three versus two. Will you decide to switch and say, no, it’s always about my safety first regardless of how many people I kill? So I think to me, this is something that it’s much more kind of real in the very near future, you know, about life and death situations, insurance companies, rather than, oh my God, my robot at home will take over and it’s going to kill me because she’s the queen, she queen of kitchen. Sorry.

Ariel Bogle: The government also released its AI ethical framework today. So if anyone wants to check that out, although it’s a suggestion only and completely unenforceable. Last question?

Audience member 3: I have a question that I’m curious about and it’s kind of in relation to, I guess, the emotional subconscious reaction to things perceived as robots. But I guess starting from things like cartoons or video games where you get attached to certain characters or, you know, movies. Like I see that as emotional reaction that is comparable to robots. So it’s kind of an extension. So like, you know, if we kind of accept robot pets, so like animated pets, and we’re kind of OK with that sort of level of emotional sort of response because I feel like that’s normal in my sort of world, and even if I get emotionally attached to like a cartoon character it’s quite normal. But you know, as we go towards the future and people in Japan are maybe marrying like these characters and getting a subconscious sort of intimacy that might similar to what might a real thing and if we get to that stage where, you know, we use robots for intimacy and sex and those sorts of human kind of subconscious emotional fulfilments that we might, that might be more convenient than say a real person. Is that a positive or a negative in your opinion or is it just progress in how we have relationships with machines?

Mari Velonaki: Who wants to start?

Justin Harvey: Myself, I think, I think just completely personally, I don’t think, I don’t think that it’s… I don’t think you’re going to get the same experience from a robot or a… I mean I never had a Tamagotchi so I’m not sure but many people did. And... but yeah, I’m not… this is why I’m kind of sceptical and I’m really like this idea of not replacing is really coming through and I’d have to agree with that. I mean I think there’s, maybe that’s more of a space for experimentation and like trying on identities or, you know, like… yeah, I’m not sure. For me personally, I’m not sure if it will take off but who knows.

Ariel Bogle: I did avoid asking the question, but we might as pose it now. Could you fall in love with a robot?

Justin Harvey: I mean I love my phone.

Mari Velonaki: Can we fall in love with a machine?

Justin Harvey: Like I do.

Belinda Dunstan: There’s a book by David Levy called Sex and Love With Robots. And he, I mean he’s been talking about this forever, and he addresses many of these different questions and if it will be a thing of replacement or what the value might be, et cetera. But my personal opinion is love who you want to love.

Mari Velonaki: I think you frame, in your question, I think you perfectly, you know, you already gave the answer. Because you said people are attached to cars, to this, to that. It’s human nature. There’s always going to be a group that’s going to be attached to something. There was a documentary of people who were, wanted to have sex with fences and public buildings. So in the Fish-Bird robots in [indistinct 59.14] there was a person who had the fascination with Fish from the Fish-Bird robot. So he used to visit the exhibition every day for a month and then go to the toilet and come back and then the police had to interfere and he was arrested because he had the thing about robots and wheelchairs. So there’s always a group somewhere. Of course with the sex robots and the sex industry and the sex dolls, they’re not exactly robots, they just have vibrating parts, there’s all sort of… but I think it’s really this fascination that we have to be attracted or repulsed by different things and…

Belinda Dunstan: To be fair Mari, your robots write love letters to the people who visit the gallery.

Mari Velonaki: It’s true. They write love letters to each other, not to people, to give to the community and they’re in love between themselves, in quotes.

Wade Marynowsky: I think if you look at the film *Her*, that is not out of the question. So people falling in love with software and having a chat bot that’s lifelike could be definitely, as Mari said, something that people could get fascinated with. And for some time perhaps have a relationship with them.

Vicki Sowry: I’m going to just jump in there and say, let’s leave it at that. And let your thinking go. I’m just aware that we started a little late so we might just wrap. And if you could come and join us on the floor, we’ve got some more drinks and some nibbles and you’re welcome to stay with us until eight o clock. So thank you Ariel.

Ariel Bogle: Thanks, you were great.

Vicki Sowry: And thank you to Justin, Mari, Belinda, and Wade. Thank you very much for being our guinea pigs for the first Salon. And thank you for coming and please enjoy your…

Mari Velonaki: Thank you all just for being… and the questions. We’re all so excited. Yeah, great, yeah.