Design Notes Episode 11 - Madeline Gannon

Google Design Podcast Transcript

Published July 10, 2018

Liam Spradlin: Design Notes is a show from Google Design about creative work and what it teaches us. In each episode, we'll talk with people from unique, creative fields to discover what inspires and unites us in our practice.

Aaron Lammer: Hello and welcome to Design Notes. I'm your guest host, Aaron Lammer. I taped this interview at SPAN 2017 in Pittsburgh this fall. I talked to Madeline Gannon about Mimus the robot she designs and programs.

Madeline Gannon: So, this robot is a standard, industrial robot like the same ones that you would find on a car factory. And, what I've done is I've programmed it to have more lifelike, personable behaviors.

Aaron: We got to talk about her approach to designing robots.

Madeline: Yeah. I describe it almost like you're working with a creature and it's a machinic creature, but a creature nonetheless. So, if she's sniffing you out and investigating you and you stand there and do nothing, she's going to get bored, just like animals at the zoo and go check out someone else.

Aaron: Madeline leads ATONATON studios, which is right here in Pittsburgh and in her spare non-robotics time she does research into wearables. Here she is, Madeline Gannon.

Madeline: Hi, Aaron.

Aaron: I went to sleep last night after your presentation yesterday uh, like in a sort of, like a vague ... I wouldn't say I had a dream about your robot-

Madeline: (laughs).

Aaron: But it was ... it was in my dre- ... like my pre-dream thoughts. Okay, so you run a studio called?

Madeline: ATONATON.

Aaron: And you made a robot. What is the robot's name?

Madeline: Uh, my robot is Mimus. So, this robot is a standard, industrial robot, like the same ones that you would find on a car factory.

Aaron: Mm-hmm (affirmative).

Madeline: And, what I've done is I've programmed it to have more lifelike, personable behaviors.

Aaron: So, physically describe Mimus for me. For someone who has um, not seen a uh, car ... a car-construction robot before.

Madeline: So, this is a one-ton machine. Just a big pile of ... of steel and motors. Um, it weighs 1200 kilograms, moves seven meters per second, can hold 300 kilograms to a millimeter of precision. So, this machine is meant to do spot welding on car chassis or um, ah, precision painting on ... in factories. Um, it's ... it's not really thought of as a thing that should be used in real time.

Aaron: Mm-hmm (affirmative).

Madeline: These things are usually preprogrammed to do short, repetitive tasks over and over again. They have really boring lives.

Aaron: So, where did you get Mimus? How did you ... How does one acquire a Mimus?

Madeline: This ... the ... the thing ... and ... You know, you go to the store-

Aaron: Yup.

Madeline: And if you can carry it out, you get to keep it.

Aaron: (laughs).

Madeline: No, so um, I have been fortunate enough to work with amazing partners who have these resources.

Aaron: So, you ... you own the studio ATONATON, which is very cool-looking from what I've seen-

Madeline: (laughs) Thank you.

Aaron: And you bring home your uh, foster uh, animal-

Madeline: Mm-hmm (affirmative).

Aaron: For the first time at a ... at like a ... a default firmware level, what is ... what comes on Mimus before you start working on Mimus?

Madeline: The ... An industrial robot is the ... the mechanical parts of it, the-

Aaron: Yeah.

Madeline: The bits and bots of the motors around the joints and the struts in between and then it has a brain. This control box that has um, its own software for controlling those lower-level things like ... like motors. So, the work that I do and ... and uh, basically just opens up that brain and lets me tinker around in it. So, I put some code on this control box that um, just listens for constant information and commands from me. Um, so, rather than being this closed black box system, I made a little doorway into it that I can send and stream information in real time.

Aaron: Do you have a preference as to whether I refer to Mimus as "he," "she," uh, or anything of that variety?

Madeline: Well, I ... I call her a "she."

Aaron: "She"? Okay.

Madeline: Um, that's the way I ... that I think about her but-

Aaron: Okay, let's ... let's go with "she."

Madeline: Okay.

Aaron: I want ... I want to speak about Mimus in your na- ... in your native uh, cadence.

Madeline: (laughs)

Aaron: So, Mimus's brain is an alchemy of code that was already part of Mimus when you got Mimus and code that you've written on top of that.

Madeline: Exactly.

Aaron: So, some of the car-welding Mimus is still there?

Madeline: Definitely.

Aaron: Do you end up disabling portions of the original way that Mimus works?

Madeline: For ... for me, I think, the important thing is to embrace this. When I ... when I think about this machine I ... I describe it almost like you're working with a creature.

Aaron: Mm-hmm (affirmative).

Madeline: And it's a machinic creature-

Aaron: Yeah.

Madeline: But a creature nonetheless. So, to work with their idiosyncrasies. So, Mimus's movement is a little bit jerky.

Aaron: Mm-hmm (affirmative).

Madeline: Um, sometimes, because this thing is not designed to respond in real time-

Aaron: Yeah.

Madeline: Um, there can be some latency in ... in me sending a command and the robot doing things. So, as a designer, I sort of, embrace these limitations as a quality of the personality of this machine and I try to um, work with them as best I can to really bring to life this individual personality of this robot.

Aaron: So, tell me what your goal was with Mimus and tell me how that ... how that was implemented at a software level.

Madeline: For me, the ... the goal of it was really to make an opportunity for people who may have never seen this amazing machine that's probably um, made the thing that they drove in today. Uh, give them an opportunity to come face-to-face and really cut through some of the ... the hyperbole that we hear in the media about robots taking our jobs or robot overlords and let them have a face-to-face conversation with this incredible machine. Now, that being said, I think um, my stance in it was very

neutral. Um, I tried to show that this ... this piece of hardware that's really just taken off the shelf um, can be reframed with a little bit of clever software and duct tape to bring it to life in a new way to show, a sort of, alternative vision of what we could do with these machines, if we so desired.

Aaron: The ... The word I would use to describe the interactions I saw with Mimus and I ... uh, this ... these videos are on the Internet, right? Somebody who's listening to this can like, google Mimus-

Madeline: Definitely.

Aaron: And see Mimus? Okay.

Madeline: Definitely, yeah.

Aaron: When Mimus is interacting ... and this is in the exhibition capacity. I ... I don't know anything about the private studio life of Mimus, but in ... in the ... in the exhibition capacity um, it reminded me a little bit of being at a zoo and some animals you see at the zoo don't care at all about you and sometimes an animal will, kind of, come up to the glass and be like, "Whoa." Like, "It's ... it's curious about me." Tell me about, like how ... how Mimus expresses curio- that idea of curiosity.

Madeline: So, that was something that I ... I really tried to emphasize. That this machinic creature is the first time that you might be visiting them and it reminded me of, like, the first time you might see a giraffe in real life.

Aaron: Mm-hmm (affirmative).

Madeline: It's just ... You might ... You might see it on television, but when you're face-to-face with it, when you can hear it,* when you can smell it, um, and sense it, it's a whole 'nother beast. Um, so we definitely played up that ... that uh, motif in the actual experiential design of visiting Mimus at the design museum in London. So, the idea of ... of pulling out and ... and of a personality with her was ... was to play off this idea of curiosity. Um, that the people who are visiting her ... It's a bit of a spectacle. She's ... she's loud, a little obnoxious um, and ... and what I wanted to show is that she is equally curious about us as we are about her.

Madeline: Um, so, there's some ways that we can do that in the interaction design. One of the challenges and actually, benefits, of working with this robot is that there's a really restricted material palette to communicate these

emotions. You have her pose. You have her posture. And you have the sound of her motors. And through those three things, uh, we can build a basic body language that's quite natural to this machine and its kinematics and how it moves. So, some of the things that um, I did to, sort of, elicit a sense of curiosity was, when you're far away from Mimus, she looks at you from above, so above your head height. And sometimes that can seem like a very frightening thing when this 1200 kilogram beast of a machine is looming over you. Um, it can feel very threatening.

Madeline: As you come closer, she switches and becomes below your head height and, sort of, sniffs up at you, like an excited puppy and jitters a little more.

Aaron: I ... I felt a sense of empathy for Mimus. What ... What kind of reactions do you get from people to Mimus out in the ... out in the wild?

Madeline: I mean, it was ... it was really incredible to see. Um, I worked, you know, 10 hours a day, 12 hours a day to bring this robot to life for about two months and then she's out in the wild and uh, and on different continents.

Aaron: Yeah.

Madeline: So, really like, checking in. I had nanny cams to check in on her uh, remotely, but ... but seeing things from social media, for example, and how people responded was pretty wild. Um, so, there was a whole range of emotions that we were able to elicit, which I was hoping for um, diversity of ... of reactions. I didn't have any prescribed goals for it. So, uh, from friendly curiosity was one thing, to um, people bringing little items and gifts and kissing the glass and tapping on the glass and um, kids really loved it right away. We ... we favored the algorithm for Mimus to look for shorter people, um, so that it would go to ... to children first and ... and get them engaged and some ... some uh, also some distrust and some creepiness about this overtly dangerous machine that could somehow seem so cute. Like, how easy are our emotions manipulated that we project our feelings onto this thing?

Aaron: Does Mimus learn?

Madeline: In the current state, Mimus doesn't learn. So, we do some machine learning to do some gesture recognition. So, for example, if you're really, really excited you can steal her attention away from someone else. So, that gesture that I looked for through the sensor is ... is basically waving your arms up and down and hopping up and down so-

Aaron: The, kind of like, "I need to pee kind of [crosstalk 00:10:36]"-

Madeline: A little bit yeah, exactly. Like, "Come see me" and then ... then that assumption is like well ... well um, I should mention that Mimus also has a ... has a bored timer. So, if she's sni-sniffing you out and investigating you and you stand there and do nothing, she's going to get bored, just like animals at the zoo and go check out someone else. So, getting really excited is the way to steal her attention as well as keep her attention for longer.

Aaron: What was unexpected about Mimus out in the world that you didn't see coming um, when she was just in your studio?

Madeline: I think, for me, one of the pleasures that I have is how close the museum staff got with the robot. And they had a little send-off for her when ... when the exhibition closed and ... and the ... the director forwarded me a thread of like, goodbye letters to Mimus. So, there was a ... there was a real caring for her, which um, again, and like you know, it's ... it's poetic and ... and lovely, but, in a machiavellian way, it meant that my interactive installation got taken really great care of uh, remotely, but so ... so it ... it's a really interesting tread to ... to walk to try to elicit emotions without really manipulating emotions. Um, but that ... that was a really unexpected thing.

Madeline: Um, also, people who visited her multiple times was really nice and um, and that ... that was something that ... that was really pleasurable.

Aaron: How did you get interested in robots in the first place? Did it start when you were a kid?

Madeline: Um, not really. I mean, I've always liked sci-fi, um, and robotics, to me, is something that I ... I've only fell into recently-

Aaron: Oh, okay.

Madeline: Um-

Aaron: So, tell me what you were doing before you got into-

Madeline: Architecture. My-

Aaron: Architecture.

Madeline: Yeah. My technical training is in architecture um, and the last year of my master's at my university I uh, my university got this CNC router, which is a machine that you can uh, connect to a computer and it can carve out material um, with ... with a ... with a bit that spins out like a ... like a drill press on a machine.

Um, so for me that was the first time that I could take my very classical architecture education in 3D model ... imagining in 3D modeling environments in a computer and actually translate them out into the physical world and that sense of instantaneous um, translation was really empowering and um, intoxicating that I ... I really quickly hit the limits of what I could do with this machine that was really designed for carpenters. Um, so, I was, you know, shoving pens inside of carving tools and experimenting with things and ... and all these ... using materials that I wasn't supposed to and what I ... what I came to the conclusion is that the ... the biggest limit for my creativity to working with this machine is that I had to communicate it through software that was designed for other people.

Madeline: So, that's when I decided to, sort of, jump into this rabbit hole to learn how to program, uh, learn how to talk to these machines and to see how we can, sort of, blur the boundary between our imagination and our digital creativity and the physical world.

Aaron: How does one start learn ... I mean I wouldn't even know what programming language you would start with if you're trying to make a Mimus.

Madeline: Um, there's ... there's a ... So, for robots and spec- specifically one of the challenges of working with them is that I ... Each robotics manufacturer has their own proprietary language for their machine. So, a lot of it is um, just investing time. And there are also, like, for the industrial robots they're so far behind in how they share knowledge. It's usually like, ace you have 15 PDFs with little pieces of information that you have to control F and find random things, and it's a lot of headaches. It's ... That's one of the reasons why I built a back-massaging robot was because it was just so stressful to program it I needed some ... some tension release.

But, that's one of the ... one of the big draws that brought me here to Pittsburgh is, as a robotics capital of North America it was um, an amazing playground to ... to start to experiment.

Aaron: Yeah, I was wondering like, what's ... what's the robotics community like here? Like, other people come in to see Mimus and they're like, you can come see my Mimus over here-

Madeline: Yeah. I mean it's pretty incredible here. You know, you go to a ... a coffee shop and you ... you hear people talking about, "Oh, you know, my encoder on my joint isn't really doing well." It's, "Oh, my gasket's viscosity isn't quite ... " It's just the ... the conversations that happen here are so nerdy and so interesting and so diverse and ... and, kind of, odd that everyone is in their ... their own um, deep well of knowledge.

Aaron: So, what are your plans with ATONATON? Where does one go with a ro- a robotics studio, if that's how you define it?

Madeline: We ... We do a lot of our work with robotics and I think for me um, what I try to focus on is, sort of, scouting under-explored territories in technology and how technology connects with people. Um, so, a lot of that is translating a lot of the energy and ... and intelligence that's happening in the virtual world into physical, tangible experiences. Um, so we explore many topics outside of robotics, for example, wearables and 3D printing and fabrication and all these things that can begin to break down barriers between our ... our imagination and what we can actually physically produce.

Aaron: Tell me about the decision to not have a face. Um-

Madeline: Yeah, it's ... it's naked. It's-

Aaron: Naked.

Madeline: In the raw. Like, even for people who work with industrial robots on a daily basis-

Aaron: Yeah.

Madeline: They probably haven't seen one like Mimus without something on the end of it doing something.

Aaron: Yeah.

Madeline: So, it was a really concerted decision to ... to keep her in the raw in ... in her ... in her element.

Aaron: Yeah.

Madeline: Um, and a part of that is ... is sort of cont ... to be a little bit of a contrarian to how robotics are dealt today is you have a really cool robot, it has to work with people, so you slap a screen on it and maybe it has some eye balls that looks at things. And to me, that is just such a missed opportunity to really explore the natural lifelikeness of this thing that is articulate and can move in the world and act in the world, um, because we ... we interact with things in our daily life, like, for example, our pets, that they don't look like us, but we can communicate with them. Um, in a really uh, eh, intuitive way, sometimes trained ways, but there's ... there's that one-way relationship with them that ... that we can negotiate with one another in a shared space and enjoy each other's company.

Aaron: What ... What are the most negative reactions you've gotten to your project been?

Madeline: Uh, certainly like ... like, um, "That's creepy."

Aaron: Mm-hmm (affirmative).

Madeline: That, "This is ... this is not good." Then, "This is ... this is not the future I want."

Aaron: Yeah.

Madeline: Which is ... th- those to me they're not negative that ... that those are incredibly valid um, emotions to have.

Aaron: Yeah.

Madeline: Um, and that those are necessary to come to the surface so ... so we can decide how this is um, as a society.

Aaron: Yeah. I mean, you kind of, have to feel a little bit like you've ... if someone had a very visceral reaction to what you've done, you have to feel a little proud that you-

Madeline: I was going to say-

Aaron: Caused a visceral-

Madeline: Like-

Aaron: Reaction.

Madeline: Like, the negative reactions are like, "Meh."

Aaron: "Robot's boring" (laughs).

Madeline: Yeah.

Aaron: Um, so where do you go from here? What's next?

Madeline: Um, I actually just added a new robot to my family.

Aaron: Oh.

Madeline: Um, so it's a much smaller robot and ... and it ... it can travel a lot easier. Packs up into some crates. So, I can actually-

Aaron: (laughs) You designed a robot that can fit into an overhead compartment?

Madeline: Uh, it ... just about-

Aaron: Yeah.

Madeline: Just about um, so ... so I'm doing a lot of work with that. I've actually been uh, working with some film directors about um, how to make sentient machines uh, as useful tools for them and ... and some other stuff but ... that hopefully will ... will come to the surface soon and for me it's just uh, robotics is ... is certainly a passion and I think it's a ... it's a interesting topic that is under-explored and I'm always keeping my nose searching for the next under-explored territory.

Aaron: Excellent. Well, thank you so much for this interview. This is super interesting.

Madeline: Oh, my pleasure.

Aaron: Um, where can people who want to know more about Mimus or want to know more about your studio find you?

Madeline: Yeah, that's great. My website is atonaton.com A-T-O-N-A-T-O-N.com and uh, you can also Google uh, "Madeline robot whisperer."

Aaron: Uh, Ma ... and uh, Mimus is M-I-M-U-S.

Madeline: Yes.

Aaron: If you're looking for ... just for ... just for Mimus. Thanks.

Madeline: Thank you.

Aaron: And that was Design Notes. I was your guest host, Aaron Lammer. I taped this at SPAN 2017 this fall in Pittsburgh. Design Notes is presented by Google Design. It's normally hosted by Liam Spradlin, who perhaps, can give us an idea of what this show is normally like.

Liam: Ah, so normally, I ... I would say it's pretty close. We have guests from a variety of different creative disciplines and we look for the commonalities running through all design work and just the different ways that we approach those from each discipline.

Aaron: Thanks, Liam. Uh, you can find out more about Design Notes and perhaps even subscribe at design.google/podcasts. Ah, you also can subscribe to the newsletter at design.google/subscribe. I want to send a huge thanks to everyone who helped make SPAN happen. Uh, there are going to be four episodes taped uh, at the SPAN 2017 conference in Pittsburgh. I encourage you to check them all out. Thank you for listening.