Changing What's Possible - S.2, Ep.3 - Transcript

Tue, Jun 06, 2023 9:40AM 22:08

SUMMARY KEYWORDS

navigation, map, xr, brandon, research, virtual reality, blind, build, product, people, work, experience, types, little bit, phd student, part, biggs, scientific rigor, auditory, company

SPEAKERS

Brandon Biggs, Dr. Marie McNeely

D **Dr. Marie McNeely** 00:01

Hello and welcome to Changing What's Possible: The Disability Innovation Podcast brought to you by Cerebral Palsy Alliance Research Foundation or CPARF. I'm your host, Dr. Marie McNeely. And this season we are excited to bring you extraordinary stories about how disability technology and innovation come together. And today we have with us Brandon Biggs. Listeners, Brandon is Chief Executive Officer of XR Navigation, one of the startup companies in our 2023 Remarkable US accelerator program. In addition, Brandon is a software engineer at the Smith-Kettlewell Eye Research Institute, Chief Financial Officer at Sonja Biggs Educational Services, and also a PhD student at the Human-centered Computing Program at the Georgia Institute of Technology. And this is going to be a two-part interview with Brandon where we'll be sharing his background and introducing his company XR Navigation in the first part in episode three. And then in our next episode, we'll share part two, where we dive into more detail about XR Navigation's products. So Brandon, thank you so much for joining us today. How are you?

B **Brandon Biggs** 01:07

I am doing great, thank you so much for having me.

D **Dr. Marie McNeely** 01:10

Well, we are thrilled that you were able to spare some time for us today to join us in this conversation. So can you start by telling us a little bit more about yourself?

B **Brandon Biggs** 01:19

You basically said all the roles that I play, so I've got many different jobs, but they overlap in probably the most important area and that most of them deal with the research and development that I'm doing on non-visual digital maps. So the XR Navigation, Smith-Kettlewell

and PhD all deal with my research on auditory maps. And then I am also the CFO at Sonja Biggs Educational Services where I am slowly weaning off that role. So I've got my replacement who will be stepping in in September, full time in there. So I'm very happy for that. But I am a blind researcher and developer and I got my master's in inclusive design from Ontario College of Art and Design back in 2019. And that's when I started my focus on non-visual mapping. So that's when I started all this research. And the reason why I am interested in this area of research is because, of course I'm blind myself and face access barriers to maps and other types of digital geographic information. And so it's a little bit personal for me. And there's not very many people who are actually doing this type of research, and even fewer who are interested in actually making it commercially available so blind people can use it in their daily lives. So that's basically the inspiration for why I started XR Navigation.

D **Dr. Marie McNeely** 02:45

Wonderful. Thank you for giving us a little bit of background about yourself, Brandon. And you mentioned a little bit of the inspiration of what got you to start XR navigation and how you started in this research area. And I know oftentimes, innovation and companies are started from someone's personal experience a problem that they've had themselves, I guess what really prompted you or encouraged you to take it from this problem or thing that you were frustrated with in real life, to actually making that leap to become an entrepreneur and trying to solve it?

B **Brandon Biggs** 03:12

When I built this tool in my master's program, it was pretty clear that there was nothing out there like it and all the blind people that we interviewed and talked with basically said, it's silly that this doesn't exist already. Why isn't it there? And the reason really is that there is nobody there to spearhead this type of innovation coming out of the blindness community. And even though places like Google and ESRI, they're really interested in accessible maps, they're sighted, and they don't know the types of conventions or tools that blind people use in order to solve a lot of these problems when they built an interface by and for blind people. And as I'm building the XR Navigation in the Audiom tool, I'm really focused on hiring blind people who can solve the problems for themselves. And so I also faced many of the challenges that other blind people face when navigating to new locations. So for example, when I came to Georgia Tech, I was basically homebound or had to go out with somebody. Whenever I wanted to go to class, for example, I can't navigate the campus without having orientation mobility lessons, especially during the summer when there's not very many people around to talk to. And this has happened to me in the past where I've been stranded on a campus and completely lost with nobody around. And before we had cell phones, that was really scary. And when I was in my undergrad, I actually did get stuck on campus and I was wandering around and finally saw somebody that I knew and they're like, "Oh, hey, Brandon, do you need help?" Yes! I need help. But now with cell phones, I can somewhat FaceTime somebody or call IRA or something like that. and they can help a little bit. But it's still really, really, really difficult to navigate spaces, both indoor and outdoor spaces when there's not very many people around because the typical orientation mobility thing you do is you ask strangers for help. And so if the strangers aren't helpful, which students aren't usually helpful, sometimes they are, but it's like 60%, no 40%, yes, then you can usually make it. But if they're not helpful, then you're really up a crick. And there's been many times many, many, many times where I've asked for help and somebody's

completely led me to the wrong place. And it's really frustrating. And that's just because I don't have a tool that's accurate enough to give me that picture in my head of where I'm supposed to be, where I'm at, and how I get from where I'm at to where I want to be. And Audiom allows you to do that. And that's just for navigation. That's not even for accessing voter information, like to see what a gerrymandered state is, or COVID statistics to see where the cases are in counties around you, or to see any kind of climate change data where the hurricane is, when a hurricane is coming, where a fire is when there's a wildfire. Those are also maps that Audoim aims to show that are really, really important, as well. But they're not usually as visceral or immediate as the navigation unless you're in the path of a hurricane, then it's super important. But I've never been in that situation, thank goodness. But I've definitely talked to people who have and one person I spoke with was relying on the state system to call them to tell them to evacuate, and they never did. And they were in the evacuation zone. They didn't know it. They survived. But it was very, very, very, very scary for them. And so that's another reason why audio maps are so important to get access to this geographic information is so critical.

D Dr. Marie McNeely 06:50

Absolutely. I'm really glad you brought up all these different examples, because I think you're absolutely right. The first thing that someone's mind jumps to when they hear map is just this idea of navigating getting somewhere that you need to go. But there are all of these different applications in which it's helpful to have geographical locations for whether it's weather whether it's disease, prevalence, things like that. So I think the products that you're developing really address a wide range of problems. And I'd like to get into maybe some of the technical details here. But just to get all of our listeners on the same page first, Brandon, can you explain a little bit what XR that term is and provide a few examples that listeners might be familiar with?

B Brandon Biggs 07:25

Yes, absolutely. So XR just stands for anything reality. And it usually encompasses augmented, mixed and virtual reality. So the reason why we decided to go with XR instead of like VR, or something like that is because we also work with creating full navigation solutions. And as part of that process, we use augmented and virtual reality. So with augmented reality, probably the most recognizable application people have experienced is Pokemon Go. And that's where you've got a digital overlay on the real environment. Mixed Reality is not as common, but it's basically where some sort of virtual interface will interact with a real world environment, and some of vice versa. So if you're walking through a mixed reality space, and you've got a dog that's walking around, it'll follow you around, or you can throw virtual ball and it'll run around and hide behind different pieces in your house. Virtual reality is where everything is completely virtual. And so most games, Mozilla hubs, or any of the VR interfaces that you interact with, with one of those headsets, those would all be considered virtual reality. And I'm very liberal with the terms. And I think there's a spectrum of like immersion that you can be in, in all these different types of XR. So I'm a big proponent of advocating for auditory virtual reality, which is basically 3D audio. And so if you've ever played a video game, or your first person, you're hearing like characters all around from your left in your right coming at you, that is, to me auditory virtual reality, and it's very immersive for somebody who's not using visuals. Whereas

if somebody is using visuals, then they have a little bit different standards for virtual reality. So I think it's a spectrum across the different senses. And so that's basically the definition of XR, and VR, AR and MR.

D Dr. Marie McNeely 09:23

Well thank you for setting the stage for us and getting everyone on the same page. I think these technical terms, like you said, there's a variety of different things that people may consider as part of one or the other. And I think having this broad definition can be really helpful when you're going into the company and starting to develop some of this yourself. So can you give us a little bit of a background of really what motivated you to found XR Navigation specifically, and how did you actually get started and starting to build this company?

B Brandon Biggs 09:49

Well, I had a customer who was the inspiration for starting this navigation solution to the magical bridge playground in Palo Alto, California, and they are ready to buy this full navigation solution that I started in my master's program, so I incorporated back in 2020, when we were ready to sign the contract. And that was our first contract. And we've been kind of working on that for a really long time. So this navigation experience has three parts to it. It has a 3D model, interactive map, where you have this little stylus, and you touch different objects on that map and hear the name of the object. And you can also hear the different zones that you're in if you lift the stylus up. And so we built this bronze miniature model. And we're using augmented reality cameras pointing down at this bronze sculpture so that you can feel and hear the names of the objects as you're moving around the bronze model. So we got that that's installed at the magical bridge playground. Now, finally, some of the technical pieces are still being worked out. But this is the first version of it, then we've got the auditory map, the digital map experience, which is Audiom, and that's kind of the primary product at the moment. And it's a virtual reality experience of navigating the playground as kind of like a little avatar. So in audio, not visually, but in audio, what you're doing is you're a first person avatar, and you would walk through the playground, as if you're really there. And as you move through the different objects, you'll hear the sound of that object underneath your feet. And as you move over that object, you'll hear the name of the object. So it's, I think, entering Ava's bridge or exiting Ava's bridge. And as you enter and exit the different objects. So here, the object underneath you, you can also scan around to see what's around you, it'll say something like Ava's bridges, three feet behind and to your right. And you can also open a menu and jump to the different objects or get directions and all kinds of stuff. So there's a lot of different functionality that we've been building into that. And this is the digital map that is kind of our primary flagship product that could really scale out. And so we've been getting a lot of research funding and grants to build this tool out. And then the third piece is we're working with our partner, Good Maps to provide a highly accurate turn by turn navigation system. So that particular piece is a final element of the magic map experience. And so when I was doing my master's program, we interviewed blind people. And they said they wanted all three of these elements in their ideal navigation solution. This was right behind having a direct brain interface that can tell the user where to go, they wanted these three elements. So we can do these three elements. We don't quite have that brain interface yet. But this experience is really what a dream would be for a blind person to navigate a space.

D Dr. Marie McNeely 12:40

Absolutely. And Brandon, you can just hear your passion coming through as you talk about this project, that you're working on all these different pieces and how they come together. So I guess taking a step back and looking at the big picture for XR Navigation, what is the overall mission of the company?

B Brandon Biggs 12:55

Our mission is to pioneer a more accessible future through inclusive solutions that work, That is really our main goal, we need something that is going to work. And what does that mean? It means a lot of different things in whatever product you're doing. But we're making sure that whatever we're building has scientific rigor behind it. And is not just us using this firm marketing claim to say, we've got this really awesome tool that we've built, that we think is going to really be transformative. No, we have evidence from academic studies that show that this is really better than alternative solutions. And we've published these studies in journals. And we've got a lot of really reproducible studies that we've done on this types of interfaces. So for example, we're doing a study now comparing an audio map of COVID cases, oh, it's similar to COVID cases over the US not exactly. We've got a fictional map with some sort of statistical element over the top, we called a choroploth map. And we're comparing that with the table. Because in best practice, right now, you provide a table for this type of map. And that's what the CDC does, and all different types of organizations that have these types of maps. So we're comparing, can you actually answer geographic questions with a table? Or do you need a visual map or an offering map? And so we're comparing those three different conditions with each other. It's really important that we have this quantitative evidence to show does it work or does it not work? And when does it work? And what situations does it work in, for who? That's kind of what we're really focused on. And then we want XR Navigation to commercialize this if it does work.

D Dr. Marie McNeely 14:34

Absolutely. And I love your focus on the scientific rigor. I think this is really important to taking that next step in the innovation side. So you are a scientist yourself, Brandon, how do your own experiences maybe inform the work that you're doing an XR Navigation? You mentioned that all these different areas in your life sort of overlap in some ways.

B Brandon Biggs 14:53

I've got a little bit of experience running a company so I started at Sonya Biggs Educational Services SBES back in 2015. So I've got a little bit of experience scaling a business from zero to several million dollars in revenue. That was a service business, this is a software business - completely different vertical. So from an experience perspective, this is both new and I can also pull on a lot of my skills previously from that. And then personally, it's a product that I would use, I want to use, I am very upset when I don't see one of these products when I'm visiting websites - I'm not able to access the map information. And you know, as a blind person, it's like, oh, there's a map lovely, I'm just going to ignore that for now, because I have no access to it. It's just a graphic when my screen reader reads a map on a website. Now, if they don't have

an alternative, and I'd say probably 90% of the time, there is no alternative. And if they do, then - The National Park Service has done this really crazy thing where they've got these really detailed descriptions of the map shows no geographic information, but it tells me a lot of stuff about the map and stuff I don't really need, if I'm trying to find a trail that I want to go on on the map. So it's very frustrating, because a map has one purpose, and that's to show the spatial relationships between those features. And that's really not being conveyed in any of the existing alternatives. That's kind of what my inspiration is just because it doesn't exist. And it's very frustrating for me almost every other blind person.

D **Dr. Marie McNeely** 16:23

Absolutely. And I'm really glad you're bringing up these issues for people who might not have visual impairments, but just to think about when they're designing websites and designing content in general to make it more accessible to a broader audience. And you've described yourself previously as half entrepreneur and half academic. And I love that you have these two sides to yourself. And I'm curious, how do you balance the two and maybe how do these two different halves of your life influence each other?

B **Brandon Biggs** 16:47

In Assistive Technology Research, it's really, really, really hard to make money in the business side, you can make a little bit and just enough to kind of sustain yourself. But when it comes to the hardcore R&D, there's really not much money out there. There hasn't been up to this point and think it's starting to change a little bit. But the academic piece is really where we can get a lot of funding to do super innovative or really risky research that's never been done, like how do we convey this type of information through an audio interface, and then do evaluations on it to make sure it works. So I see the academic side as the rigorous scientific research where we build the initial version of that product to see if it works or to see it does not work. And that's all done through research and academic funding. And then once we get that initial prototype will transfer that to a company, which will then do the final development and commercialize it and build a business model around that existing tool. That's basically the model that we've got with XR Navigation. So the Smith-Kettlewell Eye Research Institute is our academic partner in this. And then we've also got Georgia Tech now that I'm doing a PhD there as well. So that's our academic site. And that's where we're doing a lot of studies. And XR Navigation also is going to be doing some studies are getting some SBIR and STTR is which are small business grants from NIH and NSF. So we're doing some research through XR Navigation as well. But most of it is going to be around how do we get customers for these types of maps and these types of navigation experiences. And then that's going to hopefully create a sustainable product that blind people have access to in their daily lives when they're on the website, visiting all these different locations, or reading news articles that have more maps or voting maps or any kind of map that you can think of. And my goal is the Audiom component to be in every single website on the internet eventually, or something similar to it doesn't necessarily need to be Audiom, but digital auditory maps or digital, auditory and text based maps, these are super, super amazing tools that just don't exist. It's like how audio description for videos didn't exist several years ago, it was really hard to get them. So with audio maps, it's a little bit more difficult to get those and there has been some research but it dies after the PhD student leaves. Back in 2008 was the original choroploth map as I mentioned with different statistics over states. And when the PhD student leading that graduated, it died and nobody has had access to it since

and so you can go in there and download the Java file and run it on your computer. But how many people know how to do that? It's like, it's super important to me that what's done in research is moved to the commercial environment so people have access to it.

D Dr. Marie McNeely 19:40

Absolutely. And I think there's often as you mentioned, this bigger gap often called the Valley of Death between the academic research that's done and actually having a commercial product and I think that continuity is a huge problem in academic research. Has this been a struggle for you kind of being that bridge between the two or does it working pretty well and feeling pretty natural for you?

B Brandon Biggs 19:57

I'm probably reaching the point where it's gonna be the biggest struggle yet. So up to this point, XR Navigation hasn't really had that many customers. And we haven't needed to do so much customer fulfillment, the easiest stuff is to do you know, the customer discovery and all that, because it's very related to what we're doing in the research space. So we can, to some extent, we actually didn't do this, but we could have - we had gotten an IRB to actually do a study with customer discovery, and could have done something like that. We didn't do that. But now we've got customers, and we're starting to gain traction. And so now it's going to be probably the hardest that it's ever been, because I'm going to be leading hiring and funding rounds, contract fulfillment, and then also doing research in my PhD at the same time, which is going to be very, very, very intense. So talk to me in like a year or two years, I'll have a better answer for how I've managed to do it. But time management is definitely key here. And just making sure that you're dedicating enough time to each project or endeavor that you're doing.

D Dr. Marie McNeely 21:00

Certainly a lot of exciting opportunities on the way and it sounds like you're at this point with the company, Brandon, and where you're really picking up a momentum and beginning to have a big impact. And I think that is absolutely amazing. And listeners today, you've had a chance to hear some of Brandon's story. And we are going to pause here for this episode. But make sure you tune in for our next episode for part two of our interview where Brandon gets into the details of the technology they use at XR Navigation, their products and how they work, and what Brandon is looking forward to for the future of the company. And Brandon, we really appreciate you joining us to share your insights and experiences with our listeners today.

B Brandon Biggs 21:41

Thank you for having me. That was great.

D Dr. Marie McNeely 21:43

It was wonderful to chat with you and listeners, it's been great to have you with us as well. We would be so grateful if you could take a moment to leave us a review on your favorite podcast

would be so grateful if you could take a moment to leave us a review on your favorite podcast platform and to let us know what you think of the show. And we look forward to connecting with you again in our next episode of Changing What's Possible.