Alycen Wiacek

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Matthew Underwood

- Welcome to "Further Together," the ORAU podcast. As you may have noticed, I am not Michael Holtz, the usual host of "Further Together," but that's okay. We're gonna make it through. So my name is Matthew Underwood. I have co-hosted many episodes on here before. I work in the communications and marketing department at ORAU. And today's a special episode, like I said, different hosts. We also have a fairly new co-host with us as well, one of the newest members to the communications and marketing department. Abbey Becker's with me today. So Abbey, how are you doing today?

Abbey Becker

- I'm doing great, Matthew. Excited to co-host with you today.

Matthew Underwood

- Yeah, I'm excited too. It's a Friday, so we're gonna make it through, and it's gonna be good, and everybody will have a good weekend. So we're gonna make it through this and really learn some good information today. Today we are talking to one of the recipients of the Powe Award. So Abbey, we're gonna talk just for a minute to give our background about the Powe Awards.

Abbey

- Yeah.

Matthew

- So basically, the Powe Awards provide seed money for junior faculty members of one of our institution, the ORAU Consortium member university teachers to kind of get some seed money to do some research and you know, kind of build a career a little bit. So it's a really great program, and we've had a few of the recipients on before, so I'm really excited to talk to another one today. So today we're gonna bring in Alycen Wiacek of Oakland University, correct?

Abbey

- Yes, that's correct,

Matthew

- Yes, so welcome, Alycen, how are you doing today?

Alycen

- I'm great, I'm very excited to be here, and thank you all for the intro or for the invitation to be here.

Matthew

- Absolutely, so first just talk a little bit about yourself and you know, a little bit about your background and how you got to where you are today.

Alycen

- Yeah, absolutely. So I am an assistant professor at Oakland University, which is a little bit smaller research two university in southeast Michigan. And so I grew up in this area in southeast Michigan, and so during my undergrad I went to Wayne State University and I was fortunate enough to do undergraduate research in medical robotics at Wayne State, and I really found my passion at the intersection of this engineering and medicine. And so I did a brief stint in the automotive industry like many of my peers in southeast Michigan, but I ended up coming back to my roots here in this kind of engineering and medicine. And so I went back to graduate school at Johns Hopkins University where I worked with Dr. Muyinatu Bell in the photoacoustic and ultrasonic systems engineering lab. And in this lab I spent a lot of time working in engineering applications to improve women's health, particularly in breast ultrasound. So I've always been very passionate about anything I can do to improve breast cancer detection because it's just a topic that's very near and dear to my heart, and so I'm excited to continue this work as I start my own lab here at Oakland University.

Matthew

- That's all, it sounds like you've had an interesting career path there from robotics to automotives to breast cancer research, a little bit of everything along the way, so that's a fascinating kind of career path you've taken. So, you know, as a young faculty member, what does it mean to you to have received the Powe Award to kind of help you further that research a little bit?

Alycen

- Yeah, so the Powe Award actually, this is kind of an interesting tidbit, which is that I was funded by a Powe Award as a graduate student, so this was really exciting to me to kind of bring things full circle, and I was proud just because I know the Powe Award brings with it a lot of prestige, and so I was excited to kind of, to get this honor as well as having, you know, have it come full circle. But being at Oakland University, we are a smaller, like I said, research two university, a fantastic place to be. But knowing that my competition was at these much larger R one institutions made this really, this award that much more special. So I'm excited about the publicity this has brought both me and my research, but as well as our amazing university. And so I'm really grateful for the support for the work, but then also to my graduate students. Yasmine Hassan is the graduate student who's gonna be working on this project or is actively working on this project, and so I'm excited about the fact that we're able to fund her and fund the work that we're doing too.

Matthew

- Absolutely, that is incredible. Speaking of your research, you presented recently on augmented reality for a multimodal acoustic based breast biopsy at ORAU recently. Can you talk to us a little bit about your presentation?

Alycen

- Sure, so first off, I was very excited that the AREA augmented reality for Enterprise Alliance, so they cosponsored this award with the ORAU, and so it's been fantastic to be able to connect with some of these industry leaders in augmented reality. And so as a newcomer to augmented reality, the resources that ARIA provides I think is really going to help me bring technology that's more ready for clinical implementation. So they have a lot of resources related to enterprise development of augmented reality, and so having these resources at the initial level while we're developing the technology, I think will be very beneficial. And so you asked about the presentation, so I gave kind of a brief overview of my proposed project. And so that project focuses on developing a system that can incorporate information from different imaging modalities into augmented reality. And so what we're trying to do is we're trying to understand if, by bringing these different imaging modalities all together, if we can help improve targeted biopsy of breast masses through augmented reality.

Matthew

- Fantastic, that sounds like incredible research and I'm excited to hear this presentation. And to further that, to the extent that you can talk about it, how effective can augmented reality be for breast biopsy?

Alycen

- So that's, I mean, a great question, 'cause that's exactly what we're trying to figure out. So in theory, others have shown that we can display ultrasound images right in the physician's field of view using augmented reality, and so by doing so, the radiologist can then focus on this biopsy task in front of them rather than having to, you know, look up at an external monitor and then back down at the biopsy task. And so they're essentially trying to insert a biopsy needle into breast tissue, and so by displaying this information directly in front of them, we can reduce, you know, the overhead, your complexity of this task. And so what we're doing, what we're adding to this process is to be able to see not just the standard ultrasound image. So the current systems that exist just show your standard ultrasound image, which is kind of the most common, let's say, but there are other types of ultrasound based images that can provide information. So that could be like a quantitative ultrasound image, that could be elasticity. There are many different options that we hope to investigate in the future. And so we hypothesize that if we include those other types of ultrasound images into this augmented reality display, that we could help to improve biopsy targeting. And so in addition to just improving that biopsy targeting, I think there's other fields, other ways that we can improve this. And so I think that these types of augmented reality approaches really have the potential to impact potentially the way physicians are taught to perform these biopsy procedures. So for example, when physicians are being trained, how we could train them to watch the procedure to learn this dexterity that is required, they could learn to just, to have better targeting accuracy in doing so, and so I really think that's one sort of broader reaching application. But the other is really an area where my lab is particularly interested in, which is if we can have augmented reality based approaches for biopsy, we could potentially expand access to quality healthcare. So someone in some rural area or potentially in a global health situation in other areas of the world that don't have access to this high quality healthcare could be guided through a biopsy procedure through augmented reality, which I think is something that this technology really opens up in terms of bringing healthcare access to people that don't currently have access to it.

Matthew

- That's really awesome, and that's, you know, I didn't even think about that. You know, not only does it help, you know, the doctors who are performing this, but it also helps you reach a whole new audience that doesn't even have this kind of care right now, so I think that's a really good application. So as you've been, you know, doing this research and, you know, looking at it from breast cancer specifically, have you come across any other applications to where it could possibly, you know, extend to other types of cancer?

Alycen

- Yeah, absolutely. I definitely think, I've been focusing a lot on breast ultrasound and breast imaging because of my background in breast imaging, and breast biopsy procedures are very common. They're performed quite a bit all across the world, and so it's a really good area to kind of get started. However, the general idea of using augmented reality to display ultrasound images and try to guide biopsy procedures, that's something we could be using in any clinical setting, really even beyond cancer, anywhere where we're doing ultrasound guided biopsies could use this type of application.

Matthew

- So, you know, you talked a little bit about, you know, your history in, you know, breast cancer research. So how did you first become interested in this topic particularly?

Alycen

- Yeah, so I mean, I have personal, like many people, I have personal ties to breast cancer, and so I personally just, breast cancer is something that has impacted my family, and so it's something I've always been interested in pursuing. And anything that I can do as an engineer to try to improve the detection of breast cancer early is something that I'm very interested in. But that's more of kind of a broad, philosophical answer, but more specifically, my doctoral work focused heavily on breast ultrasound, and so my goal there was finding ways to improve the diagnostic accuracy of breast ultrasound. And I did this by changing the way we create and display ultrasound images. And so as a result of this work, I spent a lot of time in the breast clinic at Johns Hopkins Hospital, and I was able to learn from top radiologists and really talk to them and watch them do their job, and so these interactions really sparked a lot of ideas about how as an engineer I could use technology and develop algorithms to try to help improve how they treat patients.

Abbey

- Absolutely fantastic. I mean, as a woman, I truly commend you and thank you for the work that you're doing, it's absolutely incredible. So as a researcher, what does it mean to have a company like ORAU and ARIA investing in early career researchers?

Alycen

- Honestly, it's absolutely fantastic. The work that ORAU does to support early career researchers means a lot to me, and I'm sure to the other recipients of the Powe Award as well. The word itself, like I mentioned before, carries a significant amount of prestige, but in addition to that, to build connections with the additional sponsorship from the ARIA has been fantastic. In fact, as a direct result of the connections we've made through ORAU and then over to the ARIA, Oakland University has now become a member of the ARIA, and then leaders from the ARIA are planning to visit. We have a Oakland University augmented reality center, which is helping support this work as well, and so the members from the ARIA are planning to come visit our ORAU Augmented Reality center. And so I really think it's a truly unique and kind of a mutually beneficial collaboration that wouldn't have necessarily come up if not for the cosponsorship between the ARIA and the ORAU of this work, so it's been fantastic.

Abbey

- That's so cool to see that, you know, it has paid off into further research, you know, you receive the award and then you have the collaboration with the other, you know, organization as well to kind of lead to this research and it sounds like it's even extending even further than that, so that's super cool to hear. So for your research specifically, you know, you have the award now, you're further in this research, where do you see it going from here? What are the next steps in your career path?

Alycen

- Yeah, absolutely, so I'm still, you know, young and new at Oakland University, and so I'm really excited that ORAU has obviously funded and acknowledged the great work that we're doing in the lab with my fantastic students. I do have some recent awards working with the National Science Foundation and the National Institutes of Health. And so a lot of the work that my lab focuses on, so my lab, I've named the Magic Lab, which is the Medical Acoustics for Global Health Imaging and Clinical Translation. You know, we have to have our cool, fun acronyms-

- Absolutely.

Alycen

- To go with at our work. But where I'm hoping to take this is really to use engineering, like I said, to improve medicine and help doctors do their jobs. So we have a lot of applications, so for this project specifically, the initial development was in progress as right now to develop this application to incorporate this multimodality information. But I'm excited for the future to partner with our, we have William Beaumont School of Medicine here at Oakland University, and so we have fantastic folks there that are focusing on really clinical education tasks, and so I think it would be very interesting to really test how this technology works both in terms of, you know, targeted biopsies, but also in terms of training physicians. But my lab in general is focusing a lot on using engineering to alter, change the way, where, how we're able to use ultrasound technology. So if we can improve some of these wireless based ultrasound systems, we could really increase access to this type of technology, which I think is part of my ultimate goal is to try to increase access to ultrasound technology to those that don't currently have access to it.

Matthew

- That's so cool to think about, you know, something that you can just take and then extend it to the people that don't even have, you know, that kind of care, to really extend, you know, medical care. Of course it's a big topic across the world to kind of reach out and give these people this type of care. So I think that's awesome and a good use of research to really help the communities and help people that really don't have this type of research. So is there anything else that you wanna mention about your research or your presentation or anything that we've talked about? Is there anything else you wanna mention?

Alycen

- I don't think so. I'm grateful for the opportunity to present this as my first podcast experience here. I'm grateful for the contribution of the ORAU, and really the ARIA has been a unique experience for me. I've not dealt much with, like I said, I'm an AR newcomer, but I think there's a lot of potential with this technology, especially in the medical space. I even have other collaborations with the School of Nursing where we're working on using augmented reality, but really my home is kind of in this ultrasound and medical imaging community. And so I'm very grateful for the support that Oakland University has given me, but also the support that I have some fantastic students that are doing great work in this area, so I gave my shout out to Yasmine, but I also have other fantastic students that are working hard to try to do just that, to use engineering to try to improve medicine and improve how doctors are able to do their jobs.

Matthew

- So one other question I had speaking of your students is, you know, just how rewarding is it for you to be kind of a young faculty member, but seeing that you're making an impact on these students and watching them kind of help you further that research? What kind of, you know, feeling does that give you to see these young researchers, you know, being able to carry on that research and make a difference?

Alycen

- Yeah, the student, to be completely honest, the students are why I came to this job in the first place. After undergrad, I had a fantastic experience with, his name was Dr. Pandya at Wayne State University, and he really just gave me so much inspiration to what a faculty member can do to a student's career in the way he, you know, gave mentorship opportunities and research, but also just encouraged students to pursue their dreams and not trying to, you know, impose. We all as academics want to inspire the next generation of academics, and so I think that that's something that I really drew inspiration from him. But for me now as a faculty member, the students are why I do this job. I have several graduate students and undergraduate students, and watching them, you know, you can see, as a professor, you can see when that light bulb moment kind of, you can really see that when that light bulb moment happens, and that's just an amazing feeling to help someone get that aha light bulb moment, but also to watch what they do next. And so it's only been two years now, so I haven't gotten to see too much of, I don't have too much of a longitudinal data set that I've built, but I'm hoping, you know, as students graduate and I get to see where they go and what they do, and know that I was a part of that is a huge, you know, it's just a huge part of why I'm here and why I do this job.

Abbey

- Alycen, I have to say, your passion for your research, not only your research, but also for your students, it radiates, and it's inspiring.

Alycen

- Well, thank you so much. I hope the students would agree, but I think they would. I do, I really try to, you know, express my, you know, passion for science with them, and hope that they share, also share that passion as well.

Abbey

- Absolutely, well, I can tell that, you know, your students bring you a lot of joy and your research brings you a lot of joy. But one other question, and the final question that we always ask here is, what else in life brings you joy?

Alycen

- Hmm, that's a good question. So my family brings me a lot of joy. I was a swimmer back in the day at Wayne State University, so I think that's something. Swimming is sort of therapeutic for me. I always, you know, the pool is like my therapy, I go swim, and swimming, well, some people think that's very boring. It allows me to think through a lot of ideas, think through future grant proposals, and that really helps me a lot. And I'm very glad here actually, I can see out my window here at Oakland University. We have a beautiful pool that's right here, so that's really nice. But I would say probably my family would be the main thing, so I have an amazing, supportive husband, and my parents and sister are nearby, and so they're able, they support me quite a bit and help me through a lot of this.

Matthew

- That's awesome, well, Alycen, thank you so much for joining us today and telling us a little bit about your research and you know, your job there at Oakland University, and like Abbey kind of mentioned before, it's very inspiring the work that you're doing and also the impact that you're making on the students there as well.

Alycen

- Well, thank you so much, and thank you so much for the invitation and for taking the time out to talk to me today.

Matthew

- Absolutely, have a great day.

- [Announcer] Thank you for listening to "Further Together," the ORAU podcast. To learn more about any of the topics discussed by our experts, visit www.oau.org. You can also find us on Facebook, Twitter, and LinkedIn, @ORAU, and on Instagram, @ORAUTOGETHER. If you like "Further Together," the ORAU podcast, we would appreciate you giving us a review on your favorite podcast platform. Your reviews will help more people find the podcast.