

Virtual Undergraduate Town Hall FAQ
Designing Healthcare Robots for Children with Special Needs
Speaker: Ayanna Howard, Host: Gail Murphy
11/30 at 8pm ET

You showed a lot of different devices in your presentation, is there one that works better than another, and how do you choose when to use each one?

- We choose which device to use based on the abilities of the child. If a child has a severe disability, then we will use a virtual environment device. We choose the type of play scenario based on the abilities of the child. Most children like the activities on the tablets.

How did you get interested in this type of research?

- I (Ayanna Howard) got interested in this type of research in robotics and in the goal of robotics in middle school. When someone asked me what I wanted to do when I grew up, I was always fascinated by sci-fi; Wonder Woman and Bionic Woman were popular at the time. As a middle school student, I always wanted to build a bionic woman, and that naturally evolved into being a robotics engineer.

Would having robots that are shaped in the form of a puppy, prove to have better interactions with kids? What about from a playing perspective?

- The dog shape can provide comfort and guidance, but you don't expect a dog to tell you how to do something. If a robot says, "Move a little faster" that would seem more normal than a pet talking. However, pets do provide comfort; they serve a different kind of functionality.

What age are the children that you do most of your work with?

- We have worked with children as young as 4 and as old as 16. On average, it is about 8.

Does your research incorporate other disciplines (i.e. psychology)? Do you partner with researchers from other fields?

- Yes, my colleagues that I (Ayanna Howard) collaborate with include therapists, clinicians from Emory and Georgia State, psychology in order to understand emotions/connections/bonds, Cognitive Science to understand how we learn - new behaviors and attention.

What new advances in robotics do you think are likely to change your research?

- When deep learning can be done in real time, and if we can do it with a small sample set, my research could significantly change. Especially, when we can learn in a dynamic world, and then model the results and transfer it to other scenarios.

What is the most challenging aspect of your research?

- The most challenging part about my research is the fact that I am one of the only researchers in this domain. There isn't an option to deviate from a similar model or research plan. Using robotics to provide therapy is a new discipline and at times we are making it up as we go along, there is no template to follow. Because we had to make it up as we went along, we did make a lot of mistakes at the beginning, but they aren't mistakes if you learn from them. We learned a lot at the beginning.

What kind of computer science background do students need to have to work in your lab?

- All of my students know how to program, however that doesn't mean they are a CS major. When students come to work in my lab, they need to want to program. We use a combination of Java, C, and C sharp to program the robots.

Where do I start when it comes to finding an Undergraduate Research Experience?

- First a few questions that typically pop up are: "Should I do research?" and if I am interested, "How do I find these opportunities?". Most faculty at Universities, want to help students and would be more than happy to have undergraduate researchers in their lab. The best way to get an undergraduate research experience is ask a professor whose research you are interested in. Just ask if you want an undergraduate research experience.
- Why should you participate? If I (Ayanna Howard) didn't do research as an undergraduate student I probably wouldn't have stuck with computer science and engineering as an undergraduate student. Research helped me figure out that this is something I wanted to do; it made everything I learned in my classes more applicable.
- When to apply? You can start as early as second semester freshman year. I (Ayanna Howard) recommend that you get involved at some point as an undergraduate in a research experience. Faculty members are very open to working with undergraduate students and providing them with experience with research.

When and where can I participate in Undergraduate Research?

- You can participate in undergraduate research during the semester and during the summer. In regards to where, there are benefits to participating in research in academia as well as the industry fields.
 - Doing research at your own school can be done during the academic year, it can be done for credit, as well as an elective, and it will allow you to get to know faculty at your own institution.
 - Being a part of a research experience at a different institution, typically during the summer, allows you to see what kind of research is being conducted at other institutions and also how research might be conducted differently.
 - And a research experience in industry is different than academic research; typically it provides you a lot more applied research. You will get to see how research is applied to a product that might be available to the public in 3-5 years.
- Having experience in both types of environments will allow you, as an undergraduate student, to have a better idea of what type of career you would be most interested in, in the future.

What are 3 things one might expect to gain doing an Undergraduate Research Experience?

- 1) You can get a stipend; 2) You can get a great letter of recommendation because you get to interact with a faculty member one-on-one; and 3) You get to see the correlation between your classwork and real world application.

For more information on Undergraduate Research Experiences, please go to <http://bit.ly/INEvwPB>.