Innovation Case Study • 4 min read

Code & Circuit

Code & Circuit, a non-profit organization based in Amesbury, MA, is a place where kids can use technology to create, collaborate, and learn!

Spot is a central part of their program, where educators use the robot to get younger participants excited about STEM fields, coding, and robotics, while advanced learners have the opportunity to build applications using an industrial robot.

> **"Pretty quickly, it became clear that robots were going to play a big part in keeping things interesting here. Spot, to me on a technical level was very appealing because I know that it's a very solid industrial robot that is going to work every time we need it to."**
>
> Ken Aspeslagh, Founder

Transcript

Lori Towle, Executive Director & Founder: Every presentation that I do, regardless of age, not only do we get into robotics and what Spot is made of, what a robot is made of, how a robot is operated and controlled and coded, but we have students who have collaborated to code voice command for Spot, who created a Scratch interface for Spot so that when I go out into schools, students can actually code Spot using Scratch.

Code & Circuit is a small nonprofit computer science organization in Amesbury, Massachusetts that is a foundation for students engaged in computer science. When we think about robots and the robotics that we have here at Code & Circuit that are used with our younger friends, it's not only exciting for them, but they are learning science, math, all sorts of things that pull in the core curriculum that schools are teaching.

Ken Aspeslagh, Founder: When I moved to town here, one of the first people who I met was the computer teacher at the elementary school. And I dropped in on a few of his computer clubs and did a computer science lesson with the kids who were there. It was just so much fun that sort of hatched the idea of starting my own computer science school.

Towle: As part of my full circle classrooms business, I decided to start a pilot program in 2014. I was at a coffee shop, and I heard Ken saying, I'm going to start a computer science lab for kids. And so I tapped him on the shoulder and I said, I'm starting this and you're starting this. Could we collaborate? He's like, absolutely.

Aspeslagh: Pretty quickly, it became clear that robots were going to play a big part in keeping things interesting here. Spot, to me on a technical level was very appealing because I know that it's a very solid industrial robot that is going to work every time we need it to. And that can be a really frustrating experience for students when they go to use the robot and it doesn't work.

You might lose that kid's interest forever, especially if they just spent a week assembling it. I think that we're preparing students for careers in the STEM fields because when a college sees that they've been taking after-school computer science classes or been part of a robotics team, that's really going to help them be attractive to that school.

Alexandria Jones, Team Member: I've been applying this year as a senior and I've gotten accepted to most of my schools for computer science. I am leaning more towards cybersecurity and national defense, but also doing a minor in robotics. And I think I wouldn't have thought of that career path before joining Code & Circuit just because of how much I enjoy interacting with the robot.

Owen Silva, Team Member: We wanted a simpler interface for Lori to take to schools and be able to demo Spot without some of the overhead that the official app has, I guess, with all of its great features. Two years ago, we wanted like a way of working on our own sort of app.

And the Python SDK wasn't really great for working in Android or iOS. So I started looking at gRPC API for Spot and building out my own SDK, like the official Boston Dynamics SDK, but in a different language for mobile apps.

Will Scheirey, Instructor & Team Member: The biggest thing I got out of working with Spot before I went to WPI was building a big project. Over the span of many months, I created this Scratch extension, which sends web requests to the Spot server. And then the Spot server then relays that to Spot to tell Spot what to do.

So what I teach now is starting out with Scratch, having children learn Scratch, and then transitioning over to Python. I think getting the experience of building something that takes longer than just a couple of weeks, collaborating with the other students in the classroom is really helpful.

Towle: A lot of students come here, at a young age, they are saying, I want to be an engineer, I want to be a computer scientist. So when they're able to see Spot in action but also Spot's capabilities through everything that Boston Dynamics does, then it inspires them to really think about what they're capable of.

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