

cps-11-forecast-final

Sun, 5/15 12:25PM 17:56

SUMMARY KEYWORDS

adafruit, people, python, circuit, microcontroller, project, book, electronics, board, computer, circuit playground, cal tech, writing, code, emulate, trinket, newsletter, years, guide, technology

SPEAKERS

Paul Cutler



Paul Cutler 00:02

Welcome to the circuit Python Show. I'm your host Paul Cutler. This episode I'm joined by Anne Burrell is a professional stem maker, educator and advocate. She's the author of two published books on microcontrollers, and numerous electronics tutorials. And welcome to the show.



00:19

Thank you very much, Paul.



Paul Cutler 00:21

You've been with Adafruit for a few years. Now how did you first start working with Adafruit?



00:25

I'm an electrical engineer, but I really hadn't been doing hobby electronics for a number of years. I wanted to pick it up again. So around 2013 I started like many people with Arduino and making simple circuits and that type of thing that back then Arduinos were like \$35 a board, and that was just seemed a little expensive on my budget. So I saw Adafruit came out with a small board named trinket. And I started playing with that, that caught Adafruit attention because no one else had been really seeing that stuff for the 80. Tiny 85 was a little different than the larger Arduino. So we had to use some different techniques to get it to do the same thing. So they asked me to start writing guides on what I've been doing. It kind of evolved from there.



Paul Cutler 01:15

You went on to write a book about that trigger chip, didn't you? I did.



01:19

So make publishing had asked Adafruit if they would do a book on the trinket. And the folks at Adafruit really don't have a lot of time for for writing, you know, they're running company. So they saw that I was doing things. So they said they pass my name on and they make came and asked me and I said foolishly. Okay, and yeah, the book came out 2015 2016.



Paul Cutler 01:46

Well, I must have done pretty well, because he went on to write a second book. Getting started with the Adafruit circuit playground Express,



01:52

Adafruit had position circuit playground express as kind of their learning board. Again, make was looking for somebody to maybe write a tutorial on it, they came back to me again. And I kind of hesitated because it's like, you know, I already know all the pitfalls of writing the book, but you could say didn't want to be a one hit wonder. So I went ahead and tackled that. And that was finished in 2018, in time for Maker Faire.



Paul Cutler 02:22

So you mentioned the pitfalls. What are some of the challenges that go into writing a technical book,



02:26

I don't know, like maybe fiction, you have to do a lot of research, you have to dig into all the resources available. And books like that have a lot of projects, the first book on trinket I reused a lot of the projects, I'd done this tutorials and added some more for circuit playground Express, I didn't have quite that same resource. So I had to come up with new projects. That takes time.



Paul Cutler 02:53

What was your goal with the circuit playground book? Were you focusing more on the hardware or the software? How do you introduce a reader to both of those concepts?



03:01

Both books were getting started with books and I approach it the I tried to put myself in their shoes, like if I don't know anything about it, then maybe some simple electronics, how would I get started. So I broke it into starting with make code just easiest on programming, introducing

what the board is when it has using make code to do some projects circuit Python, it's a little more in depth. And finally, just how to set up Arduino for it, but not really showing how to program it specifically,

P

Paul Cutler 03:36

having been around Adafruit since 2013, you've really seen the birth of circuit Python, it's been five years this July since the 1.0 release has come out. What are some of your memories over that time on how the community or circuit Python itself have changed? I



03:51

was working for the US government has a diplomat up until 2018. And I'm retired after 30 years. And then I went up to New York City and Adafruit asked me if I'd like to join the company. And they said, I said yes, I mean, that sounds pretty good. And so circuit, Python back then was only about a year old. And in those early releases really kind of mirrored some of the micro Python work and adding some libraries for Adafruit hardware, and they were just getting their feel for what did they want to provide in their version of Python for their customers and a lot of that was ease of use. So the early years were saying how to make it easy to use Python on microcontrollers. And then the main thing is, as many people know, now is a lot of microcontrollers have USB controllers built in and that allows someone to plug in a microprocessor microcontroller, excuse me and use it like a thumb drive and present the memory as based on which people can copy files on, that was kind of a breakthrough. because prior to that, to program boards, you needed special hardware on your computer and you needed, you know, a cable to connect things. And then the software after you do something with the software like compilation or something, you would download it to the board. And that's all very labor intensive and fraught with learning issues. And circuitpython avoids a lot of that complication, you can just get any text editor, put some code in and try to run it. And if it doesn't run quite right, it tells you and you can try again very easily the iterative process has cut down significantly.

P

Paul Cutler 05:38

I couldn't agree more, there are over 75 Learn guides that you've written, what goes into writing a learn guide.



05:45

Originally, it was more free Lady Ada, she comes up with a lot of the concepts she that she sees all and says, Well, I'd like to see a project with Trinket and foot pedal was one of them. And it's like, okay, that's not too hard. And it's like, left up to the author to build the circuit and write the code and test it and present the material and document it in a way in which somebody without a lot of technical skills might be able to recreate the project. And again, I use that kind of put my self into their shoes concept to start from basics and lead a person through and getting the project completed.

P

Paul Cutler 06:30

Is there a collaborative nature involved with it? Are there other people who are proofing the code or proofing the actual guide itself?



06:37

Yeah, we have a number of people on the circuit Python team, for example, who helped maintain code and can do reviews of other people's code. I am the moderator, initial moderator for all guide, I can get somebody to look at something, but usually it falls back on to me switching hats to moderate the code. But Lady Atim does final moderation on every single guide because it has to be up to her standards. And you know her breadth of knowledge.

P

Paul Cutler 07:07

Hi, it's Paul. I'll get you back to the show in just a moment. Thanks for listening. And if you're enjoying the show, please tell a friend to write a review. You can also support the show financially. Your support helps cover the cost of podcast hosting, recording services and transcriptions. For more information visit circuitpythonshow.com/support. Now, back to the show. You publish the Python on microcontrollers newsletter every Tuesday, what goes into writing the newsletter



07:33

a lot more than people might think there are a lot of different corners of the internet in which interesting information might be gleaned. And there's like an email address people can use to send in information they can hash tag it circuit Python, various ways, but that doesn't tend to be used much. Even putting in PRs on GitHub, where we start publishing, most of it is hunting through places like Twitter and Instructables and Hackaday. And just any place on the web where there's interesting information. Oftentimes, I come across it through my Twitter feed, which I've gotten kind of tuned towards this particular subject. And my colleagues at Adafruit help quite a bit and letting me know what they've seen in their feeds. So all that is collated and categorized and placed into the newsletter. Oftentimes, news comes right to the very end on Monday night, something might happen and then we'll get into the newsletter. So I finish on Mondays, and then it's out Tuesday morning. So it's quite an active process.

P

Paul Cutler 08:47

It sounds like it when you think back over all the newsletters. Was there a hardware project or two that sticks out as a favorite?



08:53

I really like the projects that emulate classic computers won by Raspberry Pi when the Raspberry Pi first came out, emulating a ZX Spectrum, or no excuse me, a BBC Micro

Raspberry Pi pro first came out, emulating a ZX Spectrum, or no excuse me, a BBC Micro which was really interesting that you can get a \$4 microcontroller board to emulate a whole computer that cost you know, several 100 pounds back in the day and still do all the graphics and everything in that same vein. I'm a PC enthusiast, so anything that emulates classic PCs like IBM PC and that type of thing. I love those two, but also I really liked projects where people are making something for somebody else. In the last newsletter, there was a box and on the front was a depiction of Durance gate from Lord of the Rings. And you had to do certain things to get it to wake up and then you had to say enter or not say friend and elvish and it actually listened to some somebody's voice and if it heard the right word, it would click open some solenoids and let you inside the box. And that's just brilliant. It's nice, it's finished, people really don't know that getting a circuit together is one thing. And getting all the software to work is another. And then finally packaging it up that third leg oftentimes is just a bridge too far. And when you see people really do it up nice. It's a great thing.

P

Paul Cutler 10:29

Speaking of retro check, when did you first get into computing and electronics,



10:33

it was in high school, I was able to take an electronics course and my sophomore year, again, all I really took to it. I mean, they really weren't teaching us digital electronics at the time, it was much more power electronics and lighting, lightbulbs and that type of thing. But I really liked it. And I thought I could do it do this for a very long time. So I took electronics, three years in high school. And my senior year, I also took computer programming, and it just kind of all made sense. So I was looking to go into college to continue that. And I didn't get into my first couple schools and I kind of had to think and then I got this brochure that said, Well, if you come to our school, and they go three years there, and then you can transfer to Cal Tech, which is the school I really wanted to go to for two years, then we'll both give you a degree and okay, that's an extra year paying, it's not so great that I mean, I actually get to do what I want to do. And that was that was cool. I was able to get a electrical engineering degree from Cal Tech. And that set me off.

P

Paul Cutler 11:41

When you have the time do you have a retro tech project that you're working on or want to work on?



11:45

I do. I mean, lately, I haven't had a lot of chance to be hooking up discrete electronics, but Adafruit has been working very heavily on floppy disk technology, which is really great. And people wonder why, you know, it's it's a dead thing. There are so many floppies. And I just didn't have my whole floor over here, filled with floppy disks that I have from back in the day. But how do you read them? There's a lot of interesting data and you want to preserve, say, I want to run an IBM emulator or IBM circuit. Eventually I'll need software on those disks, software I can use. How do you get that software onto maybe a flash drive or something to get

into your emulator? That's a head scratcher. And I actually was trying to do all sorts of things a couple years ago to do that. But Adafruit has been working on the problem. And now they they're working on an interface board for a feather which hooks to a floppy drive. So I wanted to be able to work with very old computers like IBM PCs, and be able to transfer data like on this fast computer in front of me, there's this concept of a tweener computer. And that's what I've got going right here. So this is a Pentium three computer circa around the year 2000. And it's got windows 98 and Windows XP dual boot. Except it's not booting from hard drive. It's booting from a SD card. Right here, I've got floppy drives, I've got a little bit of the technology is upgraded. The CD DVD ROM is maybe from 2002 or later, it is a flat panel display gasp, I'm sorry, people. It's not CRT, but it is vintage and ZIP disk and external floppy. So I can do quite a bit of data archiving and playing around on a machine like that, which is not very easy with the modern motherboards and our computers are very old computers, I can use this to kind of talk the language of the very old computers, while still using, say the Internet to download maybe some other technology or to upload it to say Internet Archive.

P

Paul Cutler 14:04

We're almost out of time. But before we go, I have a segment called turn the tables where I've been asking all the questions now it's your turn to ask me a question.



14:12

Well, I believe this is your second season. You've interviewed a number of very interesting people. And it's wonderful. I love hearing these things. I'm sure you had some ideas on how this show would go. But now that you've got several under your belt, what surprised you about the show? I mean, technology people how things are used what caught your interest that you didn't know before.

P

Paul Cutler 14:37

There's two things that come to mind right away. The first is the guests. I think I've only had one person say no with a very valid reason. Everyone else has been totally opened up very on the show, especially before I even had an episode out so that was a huge surprise. I thought it would be harder. The second surprise which is also great and probably shouldn't surprise me as the community the number of comments and tweets I've got on Twitter and a couple of emails with encouraging statements I've just been wonderful to hear. And it really gives me encouragement to keep on going.



15:07

Well, I think you're broadcasting about a topic that a lot of people really like. That's one thing about Python, in general and circuit Python, in specific, is that it's built around a community and not necessarily just a technology, it's available for people. So there's so many online resources. There, there's a community of people that one can reach out to, it really is embracing what open source has wanted to do. And the simple fact that it is open source. So

there's no costs or licenses or anything involved. Most of its MIT open license. So it really brings together a diverse group of people went to a community that likes what they're doing, and like sharing it with people.

P

Paul Cutler 16:04

I couldn't agree more. One last question. You're starting a new project or prototype, which microcontroller are you going to reach for?



16:11

Well, if we'd done this interview a year ago, I probably would have said the SAM D 51. The Great microcontroller from Microchip has a lot of RAM and flash and peripherals I mean it you can do just incredible things with it, you know, emulating a classic computer it's like snap pretty much as long as you got the software, but they've been very hard to get as of late, while not equivalent. If I were starting a project and I thought it could most likely do most of what I wanted, I'd probably pick a Raspberry Pi RP 2040 pico based board the PICO itself from Raspberry Pi, or Adafruit has come out with a number of boards based on the RP 2040 chip like feather and Itsy Bitsy and the cutie pie and little tiny one. It also has a good deal of RAM and flash. And it just goes way fast and that with the programmable Pio capabilities, it really has changed the market as far as price performance wise. So I'd likely give one of those a shot to see what I could do with

P

Paul Cutler 17:24

it. That's a popular pick. And thanks so much for being on the show.



17:28

Thank you for having me. It's been great.

P

Paul Cutler 17:32

Thank you for listening to the circuit Python show for shownotes transcripts and to support the show visit [circuit Python show.com/support](https://circuitpython.com/support). Until next episode, stay positive