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SPEAKERS

Paul Cutler, Melissa LeBlanc-Williams

P Paul Cutler 00:01

Welcome to the CircuitPython Show. I'm your host Paul Cutler. This episode I'm joined by Melissa LeBlanc-Williams. Melissa is a maker, embedded software developer, technical writer, 3d printing enthusiast and the maintainer of Blinka, a project that allows users to run circuit Python libraries on Linux. She is sponsored by Adafruit to work on Circuit Python and Blinka. She also has her own YouTube channel called Maker Melissa's lab, where she showcases many of her own projects. She has also contributed to Tom's Hardware as a freelance features writer. Melissa, welcome to the show.

M Melissa LeBlanc-Williams 00:34

Thank you for having me here.

P Paul Cutler 00:37

You're the maintainer of Blinka. What is Blinka?

i 00:41

Blinka is Adafruit Circuit Python compatibility layer that runs on micro Python, and single board computers, such as the Raspberry Pi. This means it runs on top of Python and allows libraries that were written for circa Python, to just work with minimal changes, such as making the pin numbers, different if you needed to be.

P Paul Cutler 01:02

So it's not using the Circuit Python interpreter. When you say compatibility layer, it's hiding all of that Python and GPIO stuff from the user. They don't even have to worry about that. Is that

right?

M Melissa LeBlanc-Williams 01:13

Exactly, just actually uses the full Python library itself.

P Paul Cutler 01:18

So you should be able to do a couple of little more probably powerful type things, since you have a single board computer rather than a microcontroller. What are some of the benefits for someone to run circuit Python on a Raspberry Pi?

M Melissa LeBlanc-Williams 01:29

Well, one of the biggest advantages is you have full access to the full version of Python, along with all of its libraries, whereas circuit Python is actually just a subset of the Python language. And then you also have access to like more ICRC and spy ports and the Internet access is much more stable.

P Paul Cutler 01:47

How does something like I squared C work so you have the GPIO pins on the PI isn't isn't as easy as it is on the microcontroller just saying board dot whatever the pin number is to connect it to another microcontroller.

M Melissa LeBlanc-Williams 01:59

from the users perspective, it's the same as doing it on circuit Python. But underneath it actually uses the I octal. library that is provided on the pi. So I had actually rewritten the one for the spy that was using a C library. And now it's actually going through pure Python on that.

P Paul Cutler 02:18

Oh, neat. Are there any downsides to using blink on a circuit Python compatibility on a PI,

M Melissa LeBlanc-Williams 02:23

definitely the blink library tends to run behind the development of circuit Python, because there are fewer people working on it. So many of the modules that you may be expecting just haven't been added when it comes to certain pin types like PWM. Even the analog inputs, the Raspberry Pi has far fewer PWM pins. And actually, I don't even think it has in the analog pins

on a project that I was working on when one of my requirements was to monitor the battery level. Because I had a battery running the PI, I had to wire up an MCP 3002, which is an analog to digital converter, and just have that connected via spy.

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Paul Cutler 02:59

So what goes into being the maintainer of Blinka? What are some of the things that you do that people might not know about?

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Melissa LeBlanc-Williams 03:05

Most of it is reviewing pull requests that come in fixing bugs, sometimes adding features, but generally, it's just keeping the project in as good a shape as it can be. And sometimes that involves making decisions about what will be best for the most people such as, like what our minimum version of Python should be to give access to the latest features, but also not abandoned some of the older boards that need older versions of Python, and sometimes external things change such as circuit Python recently added typing support. But in order to do that, we had to bump the minimum version of Python up to 3.7. And actually one of the boards that was kind of stuck on version 3.6 was the Jetson Nano. So I went ahead and figured out how to get folks updated to 3.7. And on that board and update their guide, so we could continue supporting it.

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Paul Cutler 03:52

So do you try and keep up with the different Python versions when they go end of life? Or do you keep supporting older versions like 3.6 or 3.5,

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Melissa LeBlanc-Williams 04:00

we tend to update the minimum one and it kind of sticks around what circuitpython is targeting as well.

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Paul Cutler 04:08

So how many bug fixes or pull requests come through on a weekly basis?

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Melissa LeBlanc-Williams 04:12

Well, because pretty stable at this point. So bug fixes can vary from no bug fixes to maybe like three to four and a busy week. So most of the bugs are usually caused by the clinic's updates or other changes outside of Blink itself.

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Paul Cutler 04:25

P Paul Cutler 04:25

That makes sense anything planned for the future developmental Blinka

M Melissa LeBlanc-Williams 04:29

nothing really concrete plan at this time. It'll probably be either like adding new boards or porting over modules from circuit Python.

P Paul Cutler 04:36

How did you first get involved with circuit Python and later Blinka?

M Melissa LeBlanc-Williams 04:41

That's a great question. I actually had was working on my YouTube channel and one of the projects that I was doing I had created a little board where you could light up I'd actually taken like for the I think they're called matrix pixels or something like that. I can't remember the name and I why it up for them. And I was coming up with an example. And I wanted to do it in circuit Python because I wanted to give it a try. And so I basically took like one of the examples, and I just modified it till it was doing I wanted to do and I made it so you could like cycle through different colors in order to draw on the board. And that worked pretty well. So then, later on the following year, it actually written some improvements for a library that Adafruit had, that was actually for the Audrina, the RA at 75. And I increased the speed of the drawing and an example and added a function to be able to draw it faster. And I submitted that and it was right away. And eventually they had asked me if I was interested in writing a library for circuit Python for that display as well. Because I had expressed interest when they were kind of doing their yearly, what would you like to see in circuit Python? So I decided to give it a shot. Originally, I thought that the libraries for circuit Python were written in C or something like that. So I was like, going like, I don't know if I can do this. When I found out they're actually written in pure Python, I decided, okay, well, let's give it a shot. And I went through and I ended up writing, I think at the time I submitted it, it was actually the biggest library there was because there were so many functions on there. I've shrink it a little bit since but it's really hasn't shrink that all that much. So I guess I did a pretty good job on that. So after that, I just kind of started helping out in the community and just helping out with different libraries. And eventually, I talked to Adafruit about actually joining with them and working at least on a part time basis to start with, and eventually, oh, you know, actually, I had gotten to PyCon in 2019, and got to meet Scott and cat me, Brian at the time. And that was a lot of fun. And I think right around then is when I talked to them about going full time. Shortly after that I been working for Adafruit.

P Paul Cutler 07:11

So you mentioned your YouTube channel, you have dozens of videos on your YouTube channel of all the projects that you've done, what are a couple of your favorites.

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Melissa LeBlanc-Williams 07:18

My favorite is probably the animated message board they did just because it was a project that came out so nicely. It was really something I had been wanting to do since I was a teenager, I think mine actually turned out better than the original boards that inspired me because it's completely scriptable in Python, which makes things so much easier, plus its color and everything. So

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Paul Cutler 07:38

what does it do? Well, you

M

Melissa LeBlanc-Williams 07:40

can have it so it scrolls messages, pictures, you just type out messages add like effects, such as if you wanted to kind of come in from the side or kind of come together. You can add like shadowing and glow and everything. It actually came out really well. It's a library I had written called Open sign. And it made the whole scripting a lot easier.

P

Paul Cutler 08:05

I'll make sure to link to that in the show notes. One of the things that you've been sharing on your YouTube channel last year was you built a CNC machine from scratch? How did that go? And what were some of the big challenges,

M

Melissa LeBlanc-Williams 08:16

it's still going actually, I'm actually was working on it, in fact, a little bit last night. And probably one of the biggest challenges right now is trying to interface with the VFD, which is the variable frequency drive that controls the spindle speed. And this is mostly challenging because the VFD, which I got from ally Express is actually pretty poorly documented. And trying to get to do what kind of claims it should do is not quite working out it. I currently have the speed control working some properly but I'm having trouble with the forward and reverse functionality and I've been considering getting a controller upgrade but I think I'll actually just leave that for a future video because I just wanted to really finish up the current video at this point.

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Paul Cutler 08:59

How similar is building a CNC from an equipment perspective with what you would see in a 3d printer.

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Melissa LeBlanc-Williams 09:04

You need it to be much more rigid, so it has a lot of like steel plates on the one I'm building I do have some 3d printed parts. The stepper motors are a lot heavier duty but the electronics are

have some 3d printed parts. The stepper motors are a lot heavier duty but the electronics are quite different actually. Because, for instance, with the 3d printer use a lot smaller stepper motor drivers but use these pretty big ones for the CNC.

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Paul Cutler 09:27

Everyone seems to be working on a retro tech project right now. Do you have any currently on your workbench?

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Melissa LeBlanc-Williams 09:32

I actually have a couple at the moment. One of the projects I've been working on is an old Pentium three server which I bought from somebody for \$1 and thought getting that working would be as easy as just turning it on and turned out I actually need to like recap the motherboard fix the heat sinks that I broke was removing them and I get some PS to accessories for it. But it does at least boot consistently now. At this point I'm not sure if I'm willing to sink anymore or money into it and may end up just testing that everything works and then selling the parts on eBay.

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Paul Cutler 10:06

After 20 years, what did you have to do to the motherboard to fix it,

M

Melissa LeBlanc-Williams 10:09

I pretty much had to go ahead and replace all the capacitors on there because electrolytic ones just generally have a certain lifespan whether you use them the board or not, and they start leaking or bulging, and I wasn't getting any video. And what I was kind of doing some research on it. That's what somebody else was saying. So I decided to give it a shot and it actually worked. And then the other thing I've actually really been enjoying are retro mac. And it's because I actually grew up with PCs. So I never got to experience some of the older Mac's when they were current and learning all about them and repairing and upgrading them. It's really been such a joy. And actually, I have one right behind me here that you can see that I've been working on another one I got like this old PowerBook one ad that just came in the mail today, actually and looking forward to working with that.

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Paul Cutler 11:00

Apple is often in the news because of the right to repair bills that are circling around the country. Are their older Mac's much easier to upgrade and fix than their current ones.

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Melissa LeBlanc-Williams 11:10

Yes, they are. In fact, it was probably around 2014 with when they were really making their Mac's a lot less repairable.

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Paul Cutler 11:20

Which version of Mac OS are you running on some of those boxes?

M

Melissa LeBlanc-Williams 11:24

I actually had that little Mac Mini running. Mac OS nine has a G four processor in it. And the one behind me is running Mac OS eight. Really old. Yeah. And then the power book that I got, I think it had well, actually the one behind me was running system 7.6. And then I upgraded to 8.6.

P

Paul Cutler 11:46

What's it like to use some of those old operating systems?

M

Melissa LeBlanc-Williams 11:49

That's a lot. It's fun. It's a lot of learning. And that kind of goes in hand in hand with the repairing and learning how to do that, because I ended up just watching a lot of YouTube videos on how to do that and just kind of increase my knowledge a little bit at a time.

P

Paul Cutler 12:08

Hi, it's Paul. I'll get you back to the show in just a moment. Thanks for listening in. If you're enjoying the show, please tell a friend or 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. Late last year, you shared a picture on Twitter of a mysterious crate that showed up at your your door and I think you unboxed it and shared recently what what it was what was it?

M

Melissa LeBlanc-Williams 12:39

It's actually an elegoo Jupiter pre production model. Late last year, Tom's Hardware was in need of a new 3d printer reviewer and had asked me to do a review and I agreed to it though I did have my reservations because my time was kind of limited with YouTube channel and I agreed to do it because I figured it was good practice. And maybe they'll help me with like writing guides with Adafruit and stuff. So so the algu printer was actually was the first one that I received. But I actually had a second printer that came it was the voxel lab Akela s two that I ended up writing review for first because I had more experience with FDM printers, it took a while to get everything set up for doing reviews though, because the lighting in my office was pretty bad. So I didn't have a great place to photograph and the printer felt like it weighed 100 pounds. So moving it around between my home and office was actually not easy. I ended up setting up a little nice photography area, my office with good lighting and took the photographs

there. And then I moved the printer to my garage, and did most of the printing there because of the smell. And then I just took the printed items back to the office to photograph. But all in all, writing the review itself was fine. It was just trying to use such a huge resin 3d printer, when I actually had very little experience with the resin printing that proved to be the most challenging. And I ended up writing from the perspective of sharing the details that I learned along the way. And Tom Scarborough is actually very happy to review itself. But because I did didn't have a lot of time, I think it was taking a lot longer than they were hoping for. And I would say the thing that I got most out of the experience is that it gave me better confidence in my writing ability.

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Paul Cutler 14:22

Well, that's great to hear. We're almost out of time. But before we go, I've been asking all the questions and I'd like to turn the tables and let us know your question. I'm a big vinyl record fan. So I enjoy the in joke. What kind of questions do you have for me?

M

Melissa LeBlanc-Williams 14:35

Okay, what is your favorite project that you've done using Python or circuit Python?

P

Paul Cutler 14:40

My favorite project is there's two that immediately come to mind and they're both to my right and they're both music related. One I have feather with eight by four NeoPixel matrix on top of it, and I soldered on a microphone and it sits inside of my speaker base, so the speaker is on top of it. So it's my music player. Is it sound reactive and then the NeoPixels change. And then I have a Raspberry Pi project. There's a library that connects to Denon audio visual receivers. And I programmed it to control my receiver zone to in my office from that so I can change the inputs change the volume, I can mute it if a call comes in. So those are probably two of my favorite projects that I've done so far. Last question, you're about to start a new project or a prototype, which microcontroller do you reach for?

M

Melissa LeBlanc-Williams 15:26

Okay, it depends on the project. But in general, I go for like the feather form factors like if I need internet connectivity, I may reach for a board with an ESP 32 s two chip, or maybe a Raspberry Pi that's more appropriate. If I need a funny Bluetooth, I'll probably reach for an NRF 52 board like the NRF 52 840 Feather. And if I just need something in general, I tend to just go for a feather in for

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Paul Cutler 15:52

before we go if anyone wants to follow you on Twitter, or subscribe to your YouTube channel, where can they find you? They can find

M Melissa LeBlanc-Williams 15:58

me on Twitter at at Maker Melissa or on YouTube, you can search for maker Melissa's lab, and I should just come up in the results.

P Paul Cutler 16:10

Thank you to Melissa for being on the show. You can find Melissa and her projects on our YouTube channel at Maker Melissa's lab. For shownotes transcripts and to support the show visit circuitpythonshow.com. Until next episode, stay positive