Lup Yuen LEE

IoT Techie and Educator

Singapore SG
Born in 1969

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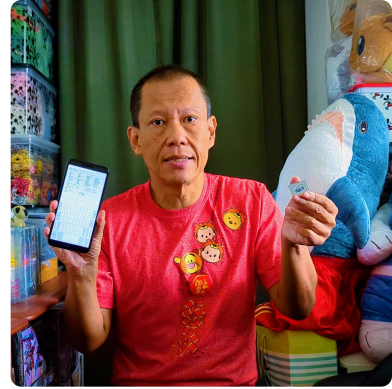
Hands-on IoT advisor and educator. Passionate about helping everyone create IoT products that will make a difference.

SKILLS

Internet of Things (IoT)
Master

lorawan | nb-iot | sigfox | apache nuttx | apache mynewt | embedded zig | embedded rust | embedded c | bl602 | nrf52 | stm32 | aws iot | google cloud iot

Cloud Computing
Master

aws | google cloud | azure | s3 | sagemaker | rds | dynamodb | lambda | api gateway | cloud functions | appengine | tensorflow | bigquery | node.js | go

Mobile Application Development
Master

ios | android | swift | react native | xcode | responsive mobile web | bootstrap

WORK EXPERIENCE

Apache NuttX PMC (Project Management Committee) at Apache NuttX RTOS September 2022- Current
https://nuttx.apache.org/

Promoting IoT Education with Apache NuttX RTOS (Real-Time Operating System)

- Ported Apache NuttX RTOS to PINE64 PinePhone (Allwinner A64 SoC / Arm Cortex-A53), PINE64 Star64 64-bit RISC-V Single-Board Computer (StarFive JH7110 SoC) and PINE64 Ox64 64-bit RISC-V Single-Board Computer (BouffaloLab BL808 SoC)

Adjunct Lecturer at Temasek Polytechnic April 2015- February 2019
📍 (SG) Singapore   http://www.tp.edu.sg

Responsible for teaching and mentoring the next generation of professionals in IoT technologies. He taught the following courses:

- IoT Application Development: He prepared and presented lessons and labs for training working adults with IoT programming skills, based on AWS IoT, Sigfox, Ubidots and Arduino. He created the training platform with various AWS services: AWS IoT, Lambda, API Gateway, S3, DynamoDB, SNS,

Elasticsearch, Kibana. His students included IT professionals from Agility, IBM, SAP, Ericsson, Canon and ITE.

- IoT Project: He supervised the students in creating innovative IoT products (based on AWS IoT and Sigfox) that solve real-world problems like dementia patient tracking, elderly home monitoring, food safety, campus security, AED management, realtime asset tracking.

Chief Technology Officer at UnaBiz August 2016- April 2018

📍 (SG) Singapore   https://unabiz.com

As former CTO of UnaBiz, he was responsible for creating new tools and systems to help people get onboard with Sigfox the quickest way possible.

- (1) UnaLocation - Enhanced Sigfox Geolocation with Machine Learning; (2) UnaRadar - Sigfox Network Finder mobile web app; (3) UnaMap - Sigfox Coverage Web Map; (4) UnaShield - Sigfox Shield for Arduino; (5) UnaBell - Smart Button on Sigfox; (6) sigfox-gcloud - Open Source Sigfox Server for Google Cloud; (7) sigfox-aws - Open Source Sigfox Server for Amazon Web Services

Principal Consultant at Konica Minolta Business Innovation Centre November 2014- September 2016

📍 (SG) Singapore   https://bic.konicaminolta.asia

He heads the software development/engineering team that architects, develops and executes proof-of-concept (POC) projects for incubating new businesses for Konica Minolta. He was also consulted for technical due diligence in investment projects and acquisitions.

- (1) Straight-Through Food & Beverage Ordering System with iOS and Android mobile apps and Kitchen Display System; (2) Bluetooth Beacon Location Analytics for Android and iOS

Chief Technology Officer at SingTel L!feLabs June 2009- November 2014

📍 (SG) Singapore   https://singtel.com

Reports directly to CEO Group Digital L!fe, Mr Allen Lew. Responsible for scanning of innovative ICT technologies worldwide and executing proof-of-concept (POC) projects for the SingTel Group. He was also consulted for technical due diligence in SingTel Innov8 investment projects and SingTel Group Strategy acquisitions.

- (1) Internet of Things (IoT); (2) Indoor Positioning; (3) Smart Retail; (4) Social Recommendation based on Facebook profiling; (5) Speech Recognition for Singapore English; (6) Image Recognition for Retail; (7) Motion Gesture User Experience; (8) Augmented Reality; (9) Cloud Gaming; (10) Virtual Reality; (11) Video Streaming and Distribution; (12) Home Automation

Principal Consultant at NCS Pte Ltd September 1994- September 2012

📍 (SG) Singapore   https://www.ncs.com.sg

Lead Enterprise Architect for Microsoft .NET technologies in Singapore's largest system integrator

- (1) IRAS Inland Revenue Integrated System; (2) Singapore Health Services Outpatient Administrative System; (3) Digital library systems for National Library Board, Singapore Polytechnic, Temasek Polytechnic, Singapore Airlines Engineering, SASCO; (4) Web portals for IDA MyeCitizen Portal, MINDEF NS Portal, MediaCorp MOBTV Portal; (5) YW8, Singapore's first mobile payment system by

NETS, DBS, SingTel, M1, StarHub

EDUCATION

Master of Science, Computer Science at University of Illinois at Urbana-Champaign
1991 - 1992
 (US) USA

Research Assistant for CHOICES Object-Oriented Operating System

Bachelor of Science, Computer Science at University of Toronto - University College
1988 - 1990
 (CA) Canada

PUBLICATIONS

RISC-V Ox64 BL808 SBC: Sv39 Memory Management Unit in lupyuen.github.io
19 November 2023

Let's boot Apache NuttX RTOS on Pine64 Ox64 64-bit RISC-V SBC... And figure out how the Sv39 Memory Management Unit works

RISC-V Ox64 BL808 SBC: Starting Apache NuttX Real-Time Operating System in lupyuen.github.io
12 November 2023

Let's boot a tiny bit of Apache NuttX Real-Time Operating System... On Pine64 Ox64 BL808 RISC-V SBC

Ox64 BL808 RISC-V SBC: Booting Linux and (maybe) Apache NuttX RTOS in lupyuen.github.io
5 November 2023

Let's boot Linux on Pine64 Ox64 BL808 RISC-V SBC... As we figure out how Apache NuttX RTOS might run on Ox64

Star64 JH7110 RISC-V SBC: Experiments with OpenSBI (Supervisor Binary Interface) in lupyuen.github.io
29 October 2023

Let's boot Apache NuttX RTOS on the Star64 JH7110 RISC-V SBC (VisionFive5 too)... And experiment with the OpenSBI Supervisor Binary Interface

Strange Workaround for TFTP Timeout in U-Boot Bootloader (Star64 JH7110 RISC-V SBC) in lupyuen.github.io
6 October 2023

Here's how we fixed TFTP Timeouts in the Star64 JH7110 U-Boot Bootloader... By sending every TFTP Data Packet twice

(Slides) Apache NuttX RTOS for PINE64 PinePhone in NuttX International Workshop 2023

29 September 2023

Smartphones are incredibly complex gadgets. What if we could learn the internals of smartphones... By booting Apache NuttX RTOS on our phone? Over the past year, we have ported NuttX to PINE64 PinePhone as an Educational Experiment. Today we can run NuttX Touchscreen Apps on PinePhone, based on Allwinner A64 SoC with Arm64 CPUs. NuttX on PinePhone will soon support Phone Calls and Text Messages on the 4G LTE Network. We hope NuttX will become a valuable tool for teaching the inner workings of modern smartphones.

(Video) Apache NuttX RTOS for PINE64 PinePhone in NuttX International Workshop 2023
29 September 2023

Smartphones are incredibly complex gadgets. What if we could learn the internals of smartphones... By booting Apache NuttX RTOS on our phone? Over the past year, we have ported NuttX to PINE64 PinePhone as an Educational Experiment. Today we can run NuttX Touchscreen Apps on PinePhone, based on Allwinner A64 SoC with Arm64 CPUs. NuttX on PinePhone will soon support Phone Calls and Text Messages on the 4G LTE Network. We hope NuttX will become a valuable tool for teaching the inner workings of modern smartphones.

(Slides) PinePhone Touchscreen on NuttX: Handling MIPI DSI, Display Engine and I2C Touch Input in NuttX International Workshop 2023
29 September 2023

This presentation explains how we built the NuttX Drivers to support Touchscreen Apps on PINE64 PinePhone: (1) MIPI DSI on Allwinner A64 SoC (2) Allwinner Display Engine (3) Goodix I2C Touch Panel (4) Integration with LVGL Graphics Library. To derisk the development, we prototyped the NuttX Drivers in the Zig Programming Language, before rewriting to C.

(Video) PinePhone Touchscreen on NuttX: Handling MIPI DSI, Display Engine and I2C Touch Input in NuttX International Workshop 2023
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(Slides) LVGL in WebAssembly: Building NuttX Touchscreen Apps with Zig and testing them in the Web Browser in NuttX International Workshop 2023
29 September 2023

What if we could prototype and test Touchscreen Apps in the Web Browser, before running on a real device? In this presentation we explain how we compiled the LVGL Graphics Library to WebAssembly with Zig Compiler. We created a NuttX App in the Zig Programming Language that runs in the Web Browser, calling the LVGL Library in WebAssembly. We hope that this will someday enable NuttX Apps to be created and tested easily in the Web Browser.

(Video) LVGL in WebAssembly: Building NuttX Touchscreen Apps with Zig and testing them in the Web

[Browser](#) in NuttX International Workshop 2023
29 September 2023

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[RISC-V Star64 JH7110: Power Up the Display Controller with U-Boot Bootloader](#) in lupyuen.github.io
2 September 2023

Let's power up the DC8200 Display Controller inside Star64 JH7110 RISC-V Single-Board Computer... By running simple commands in the U-Boot Bootloader

[RISC-V Star64 JH7110: Inside the Display Controller](#) in lupyuen.github.io
23 August 2023

Let's take a walk inside the Display Controller for Pine64's Star64 JH7110 RISC-V SBC... And find out how we'll create the Display Driver for Apache NuttX RTOS

[(Slides) What's inside a Smartphone? Exploring the internals with Apache NuttX Real-Time Operating System](#) in Apache Conference Asia 2023
19 August 2023

Smartphones are incredibly complex gadgets. What if we could learn the internals of smartphones... By booting Apache NuttX RTOS (Real-Time Operating System) on our phone? Over the past year, we have written a series of 24 articles explaining the inner workings of PINE64 PinePhone, and how we implemented the smartphone features with Apache NuttX RTOS. The articles cover the essential (and esoteric) topics on smartphone technology: MIPI DSI LCD Display, I2C Touch Panel, USB Controller, LTE Modem, Accelerometer / Gyroscope, Arm64 Interrupts and many more. We are also experimenting with newer, easier ways to create Smartphone Apps, with LVGL Graphics Library, Zig Programming Language, WebAssembly Simulation and Arm64 Emulation.

[(Video) What's inside a Smartphone? Exploring the internals with Apache NuttX Real-Time Operating System](#) in Apache Conference Asia 2023
19 August 2023

Smartphones are incredibly complex gadgets. What if we could learn the internals of smartphones... By booting Apache NuttX RTOS (Real-Time Operating System) on our phone? Over the past year, we have written a series of 24 articles explaining the inner workings of PINE64 PinePhone, and how we implemented the smartphone features with Apache NuttX RTOS. The articles cover the essential (and esoteric) topics on smartphone technology: MIPI DSI LCD Display, I2C Touch Panel, USB Controller, LTE Modem, Accelerometer / Gyroscope, Arm64 Interrupts and many more. We are also experimenting with newer, easier ways to create Smartphone Apps, with LVGL Graphics Library, Zig Programming Language, WebAssembly Simulation and Arm64 Emulation.

[RTOS on a RISC-V SBC: Star64 JH7110 + Apache NuttX](#) in hackster.io

8 August 2023

Here's how we boot a Real-Time Operating System (Apache NuttX) on the Star64 JH7110 64-bit RISC-V Single-Board Computer

Star64 JH7110 + NuttX RTOS: Creating the First Release for the RISC-V SBC in lupyuen.github.io
7 August 2023

Pine64's Star64 JH7110 RISC-V SBC is now supported in Apache NuttX RTOS Mainline! Let's review how we created the first release of NuttX for Star64

Star64 JH7110 + NuttX RTOS: RISC-V PLIC Interrupts and Serial I/O in lupyuen.github.io
2 August 2023

Apache NuttX RTOS on Pine64's Star64 JH7110 RISC-V SBC has a problem with Serial I/O Interrupts and the RISC-V Platform-Level Interrupt Controller (PLIC)... Let's fix this!

Star64 JH7110 + NuttX RTOS: RISC-V Semihosting and Initial RAM Disk in lupyuen.github.io
28 July 2023

Apache NuttX RTOS crashes on Pine64's Star64 JH7110 RISC-V SBC because there's no Semihosting. But no worries! We modified NuttX to boot with an Initial RAM Disk instead (initrd).

Star64 JH7110 + NuttX RTOS: RISC-V Privilege Levels and UART Registers in lupyuen.github.io
19 July 2023

We're porting Apache NuttX RTOS to Pine64's Star64 JH7110 RISC-V SBC... And we see interesting issues with RISC-V Privilege Levels and 16550 UART Registers

Star64 JH7110 RISC-V SBC: Boot from Network with U-Boot and TFTP in lupyuen.github.io
13 July 2023

Let's boot Apache NuttX RTOS (or Linux) over the Network with U-Boot Bootloader and TFTP... On Pine64's Star64 JH7110 RISC-V Single-Board Computer

Apache NuttX RTOS on RISC-V: Star64 JH7110 SBC in lupyuen.github.io
9 July 2023

(Partially) Booting Apache NuttX Real-Time Operating System on Pine64's Star64 64-bit RISC-V Single-Board Computer, based on StarFive JH7110 SoC

Booting RISC-V Linux on Star64 JH7110 SBC in lupyuen.github.io
4 July 2023

Watch what happens when we boot Yocto and Armbian Linux on Pine64's Star64 64-bit RISC-V Single-Board Computer, based on StarFive JH7110 SoC

[Inspecting the RISC-V Linux Images for Star64 SBC](#) in lupyuen.github.io
30 June 2023

Let's look inside the Linux Images for Pine64's Star64 64-bit RISC-V Single-Board Computer: Armbian and Yocto

[64-bit RISC-V with Apache NuttX Real-Time Operating System](#) in lupyuen.github.io
25 June 2023

Let's boot Apache NuttX Real-Time Operating System on a 64-bit RISC-V Device (QEMU Emulator) and explore the Boot Code inside NuttX

[NuttX RTOS for PinePhone: The First Year](#) in lupyuen.github.io
21 June 2023

2023 has been an awesome year for Apache NuttX RTOS on Pine64 PinePhone! Let's review the features that we've implemented... And what we'll do next

[NuttX RTOS for PinePhone: Feature Phone UI in LVGL, Zig and WebAssembly](#) in lupyuen.github.io
10 June 2023

How we created the LVGL Feature Phone UI for Pine64 PinePhone on Apache NuttX RTOS... By tweaking and testing in a Web Browser!

[(Possibly) LVGL in WebAssembly with Zig Compiler](#) in lupyuen.github.io
31 May 2023

Can we preview an LVGL App in the Web Browser... With WebAssembly and Zig Compiler? Let's find out!

[Recipe for Wholemeal Sourdough with Bread Machine](#) in lupyuen.github.io
22 May 2023

Yep it's a Sourdough Recipe

[Inside a Smartphone Accelerometer: PinePhone with NuttX RTOS](#) in hackster.io
17 May 2023

When we tilt our Smartphone from Portrait to Landscape... How does it know that we're tilting our phone? Watch what happens when we snoop the MPU-6050 Accelerometer Data from PinePhone with Apache NuttX RTOS

[NuttX RTOS for PinePhone: Phone Calls and Text Messages](#) in lupyuen.github.io
4 May 2023

Making Phone Calls and Sending SMS Text Messages with PinePhone's Quectel EG25-G 4G LTE Modem... How we'll do it with Apache NuttX RTOS

[NuttX RTOS for PinePhone: 4G LTE Modem](#) in lupyuen.github.io
12 April 2023

All about the Quectel EG25-G 4G LTE Modem inside Pine64 PinePhone... And how we'll control it with Apache NuttX RTOS

[NuttX RTOS for PinePhone: Simpler USB with EHCI (Enhanced Host Controller Interface)](#) in lupyuen.github.io
24 March 2023

Porting the Enhanced Host Controller Interface (EHCI) USB Driver... From Apache NuttX RTOS to Pine64 PinePhone

[(Clickable) Call Graph for Apache NuttX Real-Time Operating System](#) in lupyuen.github.io
5 March 2023

Here's how Apache NuttX RTOS boots on Pine64 PinePhone... Visualised as a Call Graph with Unicorn Emulator and Rust

[(Possibly) Emulate PinePhone with Unicorn Emulator](#) in lupyuen.github.io
24 February 2023

To make PinePhone testing easier... Can we emulate Arm64 PinePhone with Unicorn Emulator? Let's find out! We'll call the Unicorn Emulator in Rust

[NuttX RTOS for PinePhone: Exploring USB](#) in lupyuen.github.io
20 February 2023

What's inside the USB Controller of Pine64 PinePhone... And how we'll create a USB Driver for Apache NuttX RTOS

[NuttX RTOS for PinePhone: LVGL Terminal for NSH Shell](#) in lupyuen.github.io
3 February 2023

Let's build a Terminal App for PinePhone... With LVGL and Apache NuttX RTOS

[Apache NuttX RTOS trips ChatGPT](#) in lupyuen.github.io
29 January 2023

ChatGPT (the AI chatbot) will gladly answer questions about Apache NuttX RTOS! But the answers aren't always correct. Let's turn this into a learning opportunity, and understand why ChatGPT's answers are incorrect

[NuttX RTOS for PinePhone: Boot to LVGL](#) in lupyuen.github.io
22 January 2023

How we configure Apache NuttX RTOS to boot an LVGL Touchscreen App on Pine64 PinePhone

NuttX RTOS for PinePhone: Touch Panel in lupyuen.github.io
12 January 2023

All about the Capacitive Touch Panel inside Pine64 PinePhone... And how we created the PinePhone Touch Panel Driver for Apache NuttX RTOS

NuttX RTOS for PinePhone: What is it? in lupyuen.github.io
3 January 2023

Let's talk about Apache NuttX RTOS for Pine64 PinePhone: What is it? Why are we doing this? How will we use it?

NuttX RTOS for PinePhone: Framebuffer in lupyuen.github.io
1 January 2023

How NuttX Apps call the NuttX Framebuffer Interface to render graphics... And what's inside the Framebuffer Driver for Pine64 PinePhone

NuttX RTOS for PinePhone: LCD Panel in lupyuen.github.io
28 December 2022

Apache NuttX RTOS now boots with a Test Pattern on Pine64 PinePhone! Let's find out what's inside our new NuttX Driver for PinePhone's LCD Panel.

NuttX RTOS for PinePhone: Display Engine in lupyuen.github.io
23 December 2022

Apache NuttX Kernel now supports Allwinner A64 Display Engine on Pine64 PinePhone! Here's how we call it to render graphics on PinePhone's LCD Display

NuttX RTOS for PinePhone: MIPI Display Serial Interface in lupyuen.github.io
15 December 2022

Apache NuttX Kernel has a driver for MIPI Display Serial Interface... Here's how it will be called for rendering PinePhone's LCD Display

Preparing a Pull Request for Apache NuttX RTOS in lupyuen.github.io
28 November 2022

Here are the steps to prepare a Pull Request for Apache NuttX RTOS

NuttX RTOS for PinePhone: Render Graphics in Zig in lupyuen.github.io
15 November 2022

How we render graphics directly to PinePhone's Display Hardware... With the Zig Programming

Language and Apache NuttX RTOS

[Rendering PinePhone's Display (DE and TCON0)](#) in lupyuen.github.io
30 October 2022

How does Pine64 PinePhone render graphics on its LCD Display? Let's find out about the Allwinner A64 SoC's Display Engine (DE) and Timing Controller (TCON0).

[NuttX RTOS for PinePhone: Display Driver in Zig](#) in lupyuen.github.io
18 October 2022

Let's build a PinePhone Display Driver in Zig... That will run on Apache NuttX RTOS

[Understanding PinePhone's Display (MIPI DSI)](#) in lupyuen.github.io
2 October 2022

How does Pine64 PinePhone control its LCD Display over MIPI Display Serial Interface? Let's find out!

[NuttX on a RISC-V IoT Gadget: PineDio Stack BL604](#) in NuttX Online Workshop 2022
25 September 2022

Pine64's PineDio Stack BL604 is a RISC-V board that's packed with IoT features: Touchscreen, LoRa, WiFi, BLE, GPS and more. In this presentation we'll talk about the porting of NuttX to PineDio Stack, how we simplified the developer onboarding, and our plans to support LoRaWAN and LVGL Apps in Zig.

[Visual Programming with Zig and NuttX Sensors](#) in NuttX Online Workshop 2022
24 September 2022

What if we could drag-and-drop NuttX Sensors to create IoT Apps? In this presentation we'll explore Blockly, the web-based toolkit for Visual Programming, and how we might customise Blockly to create NuttX Sensor Apps. We'll also discuss the Zig Programming Language, and why Blockly will generate NuttX Sensor Apps as Zig programs.

[Simpler, safer LVGL Touchscreen Apps with Zig and NuttX](#) in NuttX Online Workshop 2022
24 September 2022

Is there a simpler and safer way to code Touchscreen Apps with the LVGL Graphics Library? In this presentation we'll talk about migrating a NuttX LVGL App from C to Zig, and the benefits that it brings.

[NuttX RTOS for PinePhone: Blinking the LEDs](#) in lupyuen.github.io
22 September 2022

Let's experiment with the GPIO Hardware on Pine64 PinePhone... With a little help from Apache NuttX RTOS

[NuttX RTOS for PinePhone: UART Driver](#) in lupyuen.github.io
9 September 2022

Our PinePhone Operating System will be awfully quiet if we don't implement UART Input and Output... Here's how we implemented the UART Driver for Apache NuttX RTOS

[NuttX RTOS for PinePhone: Fixing the Interrupts](#) in lupyuen.github.io
1 September 2022

How Pine64 PinePhone handles Arm64 Interrupts with the Generic Interrupt Controller... And how we implemented PinePhone Interrupt Handling in Apache NuttX RTOS

[PinePhone boots Apache NuttX RTOS](#) in lupyuen.github.io
28 August 2022

How we ported Apache NuttX RTOS to PinePhone... And what's inside the U-Boot Bootloader

[Apache NuttX RTOS on Arm Cortex-A53: How it might run on PinePhone](#) in lupyuen.github.io
25 August 2022

Apache NuttX RTOS now runs on 64-bit Arm Cortex-A53 with Multi-Core Symmetric Multi-Processing... Will it run on PinePhone? Let's find out!

[Visual Programming with Zig and NuttX Sensors](#) in lupyuen.github.io
19 August 2022

What if we could drag-and-drop NuttX Sensors... To create IoT Sensor Apps in Zig? Let's find out!

[Zig Visual Programming with Blockly](#) in lupyuen.github.io
7 August 2022

How we create a Zig program visually with Blockly, the drag-n-drop way... And how we might use it to build Sensor IoT Apps for Apache NuttX RTOS

[Read NuttX Sensor Data with Zig](#) in lupyuen.github.io
29 July 2022

Using Zig to read Sensor Data on Apache NuttX RTOS... With Bosch BME280 Temperature / Humidity / Air Pressure Sensor

[Build an LVGL Touchscreen App with Zig](#) in lupyuen.github.io
12 July 2022

Can we use Zig to build an LVGL Touchscreen App for Apache NuttX RTOS? Also wrap the LVGL API in Zig to build simpler, safer LVGL Apps? Let's find out!

[Build a PinePhone App with Zig and zgt](#) in lupyuen.github.io
25 June 2022

Can we use Zig to code PinePhone Apps? Maybe make them simpler and safer? Let's find out!

[Build an IoT App with Zig and LoRaWAN](#) in lupyuen.github.io
15 June 2022

Let's build a complex IoT App with Zig and LoRaWAN... And run it on RISC-V BL602 with Apache NuttX RTOS

[Zig on RISC-V BL602: Quick Peek with Apache NuttX RTOS](#) in lupyuen.github.io
2 June 2022

How we run Zig on the BL602 RISC-V SoC... With Apache NuttX RTOS

[(Mostly) Automated Testing of Apache NuttX RTOS on PineDio Stack BL604 RISC-V Board](#) in lupyuen.github.io
22 May 2022

Pine64 is about to launch the PineDio Stack BL604 RISC-V Board with LoRa and Touch Screen... Here's how we automatically flash and test every new release of Apache NuttX RTOS for PineDio Stack

[NuttX GPIO Expander for PineDio Stack BL604](#) in lupyuen.github.io
3 May 2022

PineDio Stack BL604 RISC-V Board has an interesting problem on Apache NuttX RTOS... Too many GPIOs! Let's fix this with a GPIO Expander

[NuttX Touch Panel Driver for PineDio Stack BL604](#) in lupyuen.github.io
21 April 2022

How we created the Apache NuttX RTOS Driver for Hynitron CST816S I2C Touch Panel... For PineDio Stack BL604 RISC-V Board

[PineDio Stack BL604 runs Apache NuttX RTOS](#) in lupyuen.github.io
12 April 2022

Running Apache NuttX RTOS on PineDio Stack BL604 RISC-V board... With ST7789 Display, LVGL Graphics and LoRaWAN

[ST7789 Display with LVGL Graphics on Apache NuttX RTOS](#) in lupyuen.github.io
2 April 2022

RISC-V BL602 SoC with ST7789 SPI Display and LVGL Graphics Library... Let's make it work on Apache NuttX RTOS!

[Rust talks I2C on Apache NuttX RTOS](#) in lupyuen.github.io
22 March 2022

Reading the Bosch BME280 I2C Sensor with Rust Embedded HAL... On BL602 RISC-V SoC and Apache

NuttX RTOS

Apache NuttX Driver for BME280 Sensor: Ported from Zephyr OS in lupyuen.github.io
10 March 2022

Apache NuttX OS talks I2C with Bosch BME280 Sensor on BL602 RISC-V SoC... Thanks to the BME280
Driver ported from Zephyr OS

Connect IKEA Air Quality Sensor to Apache NuttX OS in lupyuen.github.io
12 February 2022

How we expose the UART Port on IKEA VINDRIKTNING Air Quality Sensor... And read the PM 2.5 data
with PineDio Stack BL604 RISC-V Board

BL602 EFlash Loader: Reverse Engineered with Ghidra in lupyuen.github.io
2 February 2022

What's inside the EFlash Loader that flashes all firmware to the BL602 RISC-V SoC

Auto Flash and Test NuttX on RISC-V BL602 in lupyuen.github.io
26 January 2022

How we automagically flash and test the daily build of Apache NuttX OS on BL602 RISC-V SoC

Rust on Apache NuttX OS in lupyuen.github.io
12 January 2022

How we run Rust programs on Apache NuttX OS... And transmit a LoRa Message with Rust

Encode Sensor Data with CBOR on Apache NuttX OS in lupyuen.github.io
10 January 2022

Compressing Sensor Data with CBOR on Apache NuttX OS... By calling TinyCBOR Library

LoRaWAN on Apache NuttX OS in lupyuen.github.io
3 January 2022

Porting Semtech's LoRaWAN Stack to Apache NuttX OS... And testing it on PineDio Stack BL604 RISC-
V Board

LoRa SX1262 on Apache NuttX OS in lupyuen.github.io
22 December 2021

Porting the LoRa Driver for Semtech SX1262 from Linux to Apache NuttX OS... And testing it on PineDio
Stack BL604 RISC-V Board

[SPI on Apache NuttX OS](#) in lupyuen.github.io

13 December 2021

How we transmit and receive data over SPI on Apache NuttX OS... By coding a NuttX Device Driver

[Apache NuttX OS on RISC-V BL602 and BL604](#) in lupyuen.github.io

24 November 2021

How we build, flash and test the Apache NuttX operating system on BL602 and BL604 RISC-V SoCs

[PineDio LoRa Gateway: Testing The Prototype](#) in lupyuen.github.io

11 November 2021

How we test the pre-production PineDio LoRa Gateway by Pine64... And connect it to The Things Network

[Build a Linux Driver for PineDio LoRa SX1262 USB Adapter](#) in lupyuen.github.io

28 October 2021

How we build a LoRa SX1262 Driver for PineDio USB Adapter... And test it on Pinebook Pro

[Monitor IoT Devices in The Things Network with Prometheus and Grafana](#) in lupyuen.github.io

21 October 2021

How we monitor our IoT Sensor Devices connected to The Things Network... With Prometheus Time Series Database and Grafana Dashboards

[CBOR Payload Formatter for The Things Network](#) in lupyuen.github.io

18 October 2021

How we decode CBOR Sensor Data inside The Things Network... With a CBOR Payload Formatter

[Internal Temperature Sensor on BL602](#) in lupyuen.github.io

14 October 2021

How we read the Internal Temperature Sensor on the BL602 and BL604 RISC-V SoCs... And transmit to The Things Network

[IoT Digital Twin with Roblox and The Things Network](#) in lupyuen.github.io

8 October 2021

Can we use Roblox to monitor and control an IoT Device... Through LoRaWAN and The Things Network?

[Encode Sensor Data with CBOR on BL602](#) in lupyuen.github.io

5 October 2021

How we compress Sensor Data with CBOR... And transmit over LoRaWAN on the BL602 / BL604 RISC-V

SoC

[Grafana Data Source for The Things Network](#) in lupyuen.github.io
27 September 2021

How we visualise Sensor Data from The Things Network... With a Custom MQTT Data Source in Grafana

[The Things Network on PineDio Stack BL604 RISC-V Board](#) in lupyuen.github.io
21 September 2021

How we join The Things Network and send data to the cloud on the new PineDio Stack BL604 RISC-V Board

[LoRaWAN on PineDio Stack BL604 RISC-V Board](#) in lupyuen.github.io
16 September 2021

How we test LoRaWAN on the new PineDio Stack BL604 RISC-V Board

[Rust on RISC-V BL602: Rhai Scripting](#) in lupyuen.github.io
4 September 2021

Can we drag-and-drop Rhai Scripts... And run them on WebAssembly and BL602 RISC-V SoC?

[PineDio Stack BL604 RISC-V Board: Testing The Prototype](#) in lupyuen.github.io
29 August 2021

What's it like to create Open Source Software for brand new prototype hardware? Read on to find out!

[Rust on RISC-V BL602: Simulated with WebAssembly](#) in lupyuen.github.io
16 August 2021

Can we run Rust Firmware for BL602 RISC-V SoC in a Web Browser... Simulated with WebAssembly?

[Rust on RISC-V BL602: Is It Sunny?](#) in lupyuen.github.io
3 August 2021

How we create Rust Firmware that reads Analog Inputs... With the Analog-to-Digital Converter on RISC-V BL602

[RISC-V BL706 Audio Video Board](#) in lupyuen.github.io
14 July 2021

What's inside the Bouffalo Lab RISC-V BL706 Audio Video Board... And how it differs from BL602

[Reverse Engineering WiFi on RISC-V BL602](#) in lupyuen.github.io
7 July 2021

What happens inside the WiFi Driver on RISC-V BL602... And how we found the incomplete source code for the driver

[Machine Learning on RISC-V BL602 with TensorFlow Lite](#) in lupyuen.github.io
22 June 2021

How we run TensorFlow Lite on RISC-V BL602... To create a Glowing LED

[BL602 Bootloader](#) in lupyuen.github.io
9 June 2021

All about the BL602 RISC-V Bootloader... And how it loads the Application Firmware into XIP Flash Memory

[Simulate RISC-V BL602 with WebAssembly, uLisp and Blockly](#) in lupyuen.github.io
27 May 2021

How we simulate the BL602 RISC-V SoC with uLisp in WebAssembly... And preview Blockly uLisp Apps in the Web Browser

[uLisp and Blockly on PineCone BL602 RISC-V Board](#) in lupyuen.github.io
14 May 2021

Porting the uLisp Interpreter to PineCone BL602 RISC-V Board... And writing graphical programs with Blockly (Scratch)

[PineCone BL602 Talks LoRaWAN](#) in lupyuen.github.io
11 May 2021

How we connect PineCone BL602 RISC-V Board to LoRaWAN... With the Pine64 RFM90 LoRa Module

[Build a LoRaWAN Network with RAKwireless WisGate Developer Gateway](#) in lupyuen.github.io
30 April 2021

How we set up our own LoRaWAN Network with RAKwireless RAK7248 WisGate Developer D4H Gateway... And test it with RAKwireless WisBlock in Arduino

[Run Rust RISC-V Firmware with BL602 IoT SDK](#) in lupyuen.github.io
21 April 2021

How we build, flash and run Rust firmware on BL602 RISC-V SoC... With the BL602 IoT SDK

[PineCone BL602 RISC-V Board Receives LoRa Packets](#) in lupyuen.github.io
4 April 2021

How PineCone BL602 RISC-V Board with SX1276 receives LoRa packets... Transmitted by RAKwireless WisBlock

[RAKwireless WisBlock talks LoRa with PineCone BL602 RISC-V Board](#) in lupyuen.github.io
11 March 2021

How we receive LoRa packets transmitted by PineCone BL602 RISC-V Board ... With RAKwireless WisBlock in Arduino

[Connect PineCone BL602 to LoRa Transceiver](#) in lupyuen.github.io
7 March 2021

How we transmit LoRa packets on PineCone BL602 RISC-V Board ... With Semtech 1276 or Hope RF96

[The RISC-V BL602 Book](#) in lupyuen.github.io
20 February 2021

Your free open-source resource for learning RISC-V BL602 SoC

[PineCone BL602 Talks UART to Grove E-Ink Display](#) in lupyuen.github.io
19 February 2021

How we render an image with PineCone BL602 RISC-V Board ... On Grove Triple Colour E-Ink Display with UART Interface

[PineCone BL602 Blasting Pixels to ST7789 Display with LVGL Library](#) in lupyuen.github.io
16 February 2021

How we render text and graphics on PineCone BL602 RISC-V Board ... With ST7789 SPI Display and LVGL Graphics Library

[PineCone BL602 talks SPI too!](#) in lupyuen.github.io
7 February 2021

PineCone BL602 RISC-V Board talks to BME280 Sensor over SPI... Let's find out how

[PineCone BL602 talks to I2C Sensors](#) in lupyuen.github.io
29 January 2021

How we call the BL602 RISC-V Hardware Abstraction Layer to access the BME280 I2C Sensor

[Mynewt GPIO ported to PineCone BL602 RISC-V Board](#) in lupyuen.github.io
15 January 2021

How we ported the BL602 RISC-V Hardware Abstraction Layer to Apache Mynewt ... Starting with GPIO

[Control PineCone BL602 RGB LED with GPIO and PWM](#) in lupyuen.github.io
6 January 2021

Explore the BL602 GPIO and PWM Demo Firmware... And how they call the GPIO and PWM Hardware Abstraction Layer

[Flashing Firmware to PineCone BL602](#) in lupyuen.github.io
1 January 2021

What happens when we flash RISC-V firmware to PineCone BL602 Board... And what's inside the BL602 Boot Image, Partition Table, Device Tree and EFuse Configuration

[Porting Mynewt to PineCone BL602](#) in lupyuen.github.io
21 December 2020

How we port Apache Mynewt embedded operating system to the PineCone BL602 RISC-V Board

[Better Open Source Advocate](#) in lupyuen.github.io
15 December 2020

I made mistakes in 2020... Here's how I'll do better in 2021

[Debug Rust on PineCone BL602 with VSCode and GDB](#) in lupyuen.github.io
14 December 2020

How we build and debug Embedded Rust Firmware for PineCone BL602... With VSCode and GDB

[Connect PineCone BL602 to OpenOCD](#) in lupyuen.github.io
11 December 2020

How we connect PineCone BL602 Evaluation Board to OpenOCD... For flashing and debugging RISC-V firmware

[Quick Peek of PineCone BL602 RISC-V Evaluation Board](#) in lupyuen.github.io
29 November 2020

What's inside the PineCone BL602 Evaluation Board... And how we're using it to contribute to the RISC-V Open Source Ecosystem

[(UNFINISHED) Draw your own PineTime Watch Face... From WebAssembly to Embedded Rust](#) in lupyuen.github.io
18 November 2020

How we build a hand-drawn Watch Face for PineTime Smart Watch... Starting from WebAssembly to Embedded Rust

[Create Your Own PineTime Watch Face in Rust... And Publish on crates.io](#) in lupyuen.github.io
17 October 2020

How we build PineTime Watch Faces with Rust and LVGL... And publish them on crates.io

[Bluetooth Time Sync and LVGL on PineTime Mynewt](#) in lupyuen.github.io
16 October 2020

How PineTime syncs the time over Bluetooth LE with Mynewt and NimBLE... And how we create Watch Faces with LVGL

[Porting PineTime Watch Face from C to Rust On RIOT with LVGL](#) in lupyuen.github.io
13 September 2020

Converting Embedded C to Rust is not that hard... Here's how we convert a PineTime Watch Face with LVGL from C to Rust on RIOT

[Safer, Simpler Embedded Programs with Rust on RIOT (Presentation)](#) in RIOT Summit
11 September 2020

Tired of pointer problems on Embedded C? It's time to switch over to a safer, simpler way of coding: Embedded Rust. We'll look at Rust hosted on RIOT and how it's used to create LVGL watch apps for PineTime Smart Watch.

[Safer, Simpler Embedded Programs with Rust on RIOT (Video)](#) in RIOT Summit
11 September 2020

Tired of pointer problems on Embedded C? It's time to switch over to a safer, simpler way of coding: Embedded Rust. We'll look at Rust hosted on RIOT and how it's used to create LVGL watch apps for PineTime Smart Watch.

[Preview PineTime Watch Faces in your Web Browser with WebAssembly](#) in lupyuen.github.io
19 August 2020

How we build and preview PineTime Watch Faces with only a web browser... No computer needed!

[Build PineTime Firmware in the Cloud with GitHub Actions](#) in lupyuen.github.io
27 July 2020

Learn to build PineTime Smart Watch Firmware in the Cloud... No computer needed!

[Wayland and LVGL on PinePhone with Ubuntu Touch](#) in lupyuen.github.io
25 July 2020

Learn about Wayland and Ubuntu Touch on PinePhone... And how we build PinePhone Apps with LVGL

[(UNFINISHED) Auto Convert Go to Dart with an Abstract Syntax Tree](#) in lupyuen.github.io
9 July 2020

How we convert Go code to Dart and Flutter automatically with an Abstract Syntax Tree

[Flutter State Management with Bloc for PineTime Companion App](#) in lupyuen.github.io
27 June 2020

How we manage state with the Bloc Library in the Flutter Companion App (Android and iOS) for PineTime Smart Watch

[PineTime doesn't run Linux... But that's OK!](#) in lupyuen.github.io
19 June 2020

Getting started with PineTime Smart Watch

[Your First GTK App with Go and VSCodium](#) in lupyuen.github.io
18 June 2020

Creating desktop apps on Linux doesn't have to be hard... Let's build GTK+ 3 apps in Go with the gotk3 library!

[Convert Go to Flutter and Dart for PineTime Companion App](#) in lupyuen.github.io
17 June 2020

How we build the Flutter Companion App (Android and iOS) for PineTime Smart Watch by converting Go to Dart

[Your First Bluetooth Low Energy App with Flutter](#) in lupyuen.github.io
4 June 2020

Bluetooth Low Energy apps are ridiculously easy to code with Flutter and Dart, let me show you how!

[Porting MicroPython and wasp-os to Mynewt on PineTime Smart Watch (nRF52)](#) in lupyuen.github.io
2 June 2020

Making wasp-os truly awesome with full multitasking, interoperable firmware updates and a common companion app

[Wireless Firmware Update In Action on PineTime Smart Watch (nRF52)](#) in lupyuen.github.io
20 May 2020

Observe step-by-step the Wireless Firmware Update running on PineTime Smart Watch (nRF52) with MCUBoot Bootloader, NimBLE Bluetooth LE Stack and Apache Mynewt

[MCUBoot Bootloader for PineTime Smart Watch (nRF52)](#) in lupyuen.github.io
18 May 2020

Wireless Firmware Updates done right on PineTime Smart Watch... With the open source MCUBoot Bootloader from Apache Mynewt and Zephyr

[Configure Mynewt for SPI Flash on PineTime Smart Watch (nRF52)](#) in lupyuen.github.io

15 May 2020

Configure Mynewt OS to enable access to SPI Flash Memory on PineTime Smart Watch

[Firmware Update over Bluetooth Low Energy on PineTime Smart Watch](#) in lupyuen.github.io
11 May 2020

Flash any firmware to PineTime from our mobile phone... Without opening the watch!

[CHIP-8 Game Emulator in Rust for PineTime Smart Watch](#) in lupyuen.github.io
5 March 2020

Running Retro Games with Rust is not that hard on PineTime Smart Watch. Here's how I ported a CHIP-8 Game Emulator to PineTime

[Visual Rust for PineTime Smart Watch](#) in Visual Studio Marketplace
5 March 2020

Create and edit Embedded Rust programs visually by dragging and dropping blocks

[My First Week As Embedded FOSS Advocate](#) in lupyuen.github.io
4 February 2020

Have humans become so greedy for profit… That we have forgotten how to teach one another and advance our species?

[Debug RIOT-OS on PineTime with VSCode](#) in Medium
2 February 2020

VSCode debugging configuration for RIOT

[If you're in the East, please consider Rust!](#) in Medium
24 January 2020

Coding in Embedded C is like building a skyscraper without scaffolding

[Debug Rust+Mynewt Firmware for PineTime on Raspberry Pi](#) in lupyuen.github.io
23 January 2020

Using only a Raspberry Pi, we can debug the firmware on PineTime Smart Watch: Step into the flashed program line by line, set a breakpoint to pause execution at a line, inspect variables at runtime, … Just like the Embedded Pros!

[OpenOCD on Raspberry Pi: Better with SWD on SPI](#) in lupyuen.github.io
18 January 2020

Instead of sending SWD data over GPIO one bit at a time, what if we could blast out the data over

Raspberry Pi's SPI interface?

[Build and Flash Rust+Mynewt Firmware for PineTime Smart Watch](#) in lupyuen.github.io
8 January 2020

Programming a PineTime is not that hard… All you need is a Raspberry Pi, some wires and a little creativity!

[Optimising PineTime's Display Driver with Rust and Mynewt](#) in lupyuen.github.io
29 December 2019

Simple tweaks like Batched Updates and Non-Blocking SPI can have a huge impact on rendering performance

[Porting [druid] Rust Widgets to PineTime Smart Watch](#) in lupyuen.github.io
14 December 2019

Code Watch Apps in Rust the Declarative Way

[My 5-Year IoT Mission](#) in lupyuen.github.io
4 December 2019

5 years ago I decided to fix every link in the IoT Chain so that we can create really useful and affordable IoT gadgets, the Lean and Agile Way

[Hey GD32 VF103 on RISC-V: I surrender… For now](#) in lupyuen.github.io
23 November 2019

Porting Mynewt OS to GD32 VF103 on RISC-V was a nightmare

[Building a Rust Driver for PineTime's Touch Controller](#) in lupyuen.github.io
22 November 2019

Programming the Hynitron CST816S Capacitive Touch Controller

[Sneak Peek of PineTime Smart Watch… And why it's perfect for teaching IoT](#) in lupyuen.github.io
15 November 2019

PineTime is the spiritual successor to BBC micro:bit

[Porting Apache Mynewt OS to GigaDevice GD32 VF103 on RISC-V](#) in lupyuen.github.io
30 October 2019

Many GD32 VF103 RISC-V developer boards are coming real soon... And Mynewt OS would be perfect for them

[Bluetooth Mesh with nRF52 and Apache Mynewt](#) in lupyuen.github.io
15 October 2019

Set up an nRF52 mesh network, step by step, without any coding

[Coding nRF52 with Rust and Apache Mynewt on Visual Studio Code](#) in lupyuen.github.io
3 October 2019

nRF52 works with popular open-source tools on Windows and macOS like VSCode, OpenOCD, Rust and
ST-Link

[Build an NB-IoT GPS Tracker on STM32 L476 with Apache Mynewt and Embedded Rust](#) in
lupyuen.github.io
22 September 2019

Let's build a simple gadget that determines its current location based on received GPS signals… And
transmits the location to a server via NB-IoT

[Quick Peek of Huawei LiteOS with NB-IoT on Ghostyu NB-EK-L476 Developer Kit (STM32L476RCT6)](#) in
lupyuen.github.io
4 September 2019

Peek into the LiteOS + Application source code that was bundled with the NB-IoT Developer Kit

[Low Power NB-IoT on STM32 Blue Pill with Apache Mynewt and Embedded Rust](#) in lupyuen.github.io
30 August 2019

Learn to optimise the power consumption of the NB-IoT Sensor Application in the previous tutorial

[Visual Embedded Rust Programming with Visual Studio Code](#) in lupyuen.github.io
17 August 2019

Create and edit Embedded Rust programs for STM32 Blue Pill and Apache Mynewt… By dragging and
dropping blocks!

[Advanced Topics for Visual Embedded Rust Programming](#) in lupyuen.github.io
17 August 2019

Watch what happens behind the scenes when you create a Visual Embedded Rust program

[Rust Rocks NB-IoT! STM32 Blue Pill with Quectel BC95-G on Apache Mynewt](#) in lupyuen.github.io
4 August 2019

Hardly anyone writes embedded programs in Rust for microcontrollers (like STM32 Blue Pill), we all use
C. But we really should switch to Rust!

[Connect STM32 Blue Pill to NB-IoT with Quectel BC95-G and Apache Mynewt](#) in lupyuen.github.io

25 July 2019

Let's build an IoT sensor with a real microcontroller — STM32 Blue Pill — and a real NB-IoT module — Quectel BC95-G!

[Get Started with NB-IoT and Quectel modules](#) in lupyuen.github.io
15 July 2019

How to use a Quectel evaluation board to send a CoAP message to the CoAP server hosted at thethings.io

[Visual Programming with Embedded Rust? Yes we can with Apache Mynewt and Google Blockly!](#) in Medium
11 July 2019

Simpler embedded coding, the visual way

[Safer, Simpler Embedded Rust with Apache Mynewt on STM32 Blue Pill](#) in lupyuen.github.io
7 July 2019

Declarative and Procedural Macros (plus bindgen and tips for Visual Studio Code) to protect Embedded Rust coders from stumbling into embedded traps

[Hosting Embedded Rust apps on Apache Mynewt with STM32 Blue Pill](#) in lupyuen.github.io
9 June 2019

It's time to drop our legacy programming practices and adopt smarter, safer ways to exploit these microcontrollers… starting with Apache Mynewt and Rust.

[Build Your IoT Sensor Network—STM32 Blue Pill + nRF24L01 + ESP8266 + Apache Mynewt + thethings.io](#) in lupyuen.github.io
27 May 2019

Let's build a Sensor Network running on two Blue Pills with nRF24L01 and ESP8266

[Super Blue Pill—Like STM32 Blue Pill, But Better!](#) in lupyuen.github.io
21 May 2019

Friendlier for newbies, supports ESP8266 WiFi and nRF24L01

[Connect STM32 Blue Pill to ESP8266 with Apache Mynewt](#) in lupyuen.github.io
20 April 2019

And WiFi Geolocation with ESP8266

[Create your IoT gadget with Apache Mynewt and STM32 Blue Pill](#) in lupyuen.github.io
26 March 2019

Apache Mynewt is a free, open-source realtime operating system for microcontrollers

[Push AWS IoT sensor data to Redshift with Kinesis Firehose](#) in Medium
10 March 2019

AWS IoT Rules Engine and Kinesis Firehose were designed to stream live sensor data into Redshift for storage and analysis

[Transform and Import a JSON file into Amazon Redshift with AWS Glue](#) in Medium
8 March 2019

With AWS Glue it's now possible to keep our Redshift data warehouses in sync with JSON-based data stores… So we may exploit the full potential of business analytics and machine learning in AWS!

[Connecting AWS Lambda Node.JS to Redshift or PostgreSQL? Try AWS Lambda Layers!](#) in Medium
6 March 2019

With Lambda Layers it's really easy to connect our Node.js Lambda Function to Redshift or PostgreSQL

[STM32 Blue Pill — Bootloading the WebUSB Bootloader](#) in lupyuen.github.io
25 February 2019

How do we upgrade the Bootloader when it's always running in the background, waiting for flashing requests? This article explains a special technique I used to upgrade the MakeCode Bootloader over WebUSB… I call it "Baseloading"

[STM32 Blue Pill — Dissecting the WebUSB Bootloader for MakeCode](#) in lupyuen.github.io
16 February 2019

Explore the innards of the MakeCode Bootloader that I have ported to Blue Pill

[STM32 Blue Pill — Unit Testing with Qemu Blue Pill Emulator](#) in lupyuen.github.io
7 February 2019

Computing sensor values in IoT devices can be prone to bugs… And Unit Testing can help to stop the bugs before they pollute the entire IoT chain

[STM32 Blue Pill – Shrink your math libraries with Qfplib](#) in lupyuen.github.io
30 January 2019

Filling in tiny math functions with nano-float

[STM32 Blue Pill — Analyse and Optimise Your RAM and ROM](#) in lupyuen.github.io
24 January 2019

Learn the tips and tools to prevent Blue Pill Bloat

[STM32 Blue Pill USB Bootloader—How I fixed the USB Storage, Serial, DFU and WebUSB interfaces](#) in lupyuen.github.io

18 December 2018

STM32 Blue Pill is a remarkable microcontroller for US$ 2. I proved it by running the USB Storage, USB Serial, USB DFU (Direct Firmware Upgrade) and WebUSB interfaces all on the same Blue Pill concurrently, without any additional hardware!

[STM32 Blue Pill Visual Programming with MakeCode, CODAL and libopencm3](#) in Medium

9 December 2018

This work-in-progress document describes an incomplete implementation of STM32 Blue Pill visual programming

[Sigfox Teacher Answers Your Questions](#) in Medium

7 December 2018

I teach Sigfox to working professionals. Here are their questions…

[以 thethings.iO 來將 BBC micro:bit 感測器圖形化](#) in 少儿编程教程网

29 November 2018

如果您可以將您以電池供應電力的BBC micro:bit設置在城市裡的任何一個角落來收集感測資料 … 或者是隨時查看從家裡、學校、工作場所即時更新的感測資料 … 不是很酷嗎?

[Visualising BBC micro:bit sensors with thethings.iO](#) in Medium

17 November 2018

Wouldn't it be cool if you could plant your BBC micro:bit anywhere in the city (powered by batteries) to collect sensor data… And watch live updates of the sensor data from your home, school, workplace, … Even on the go?

[連接 BBC micro:bit 與 Sigfox 物聯網](#) in MakerPRO

13 November 2018

使用 BBC micro:bit 連接 Sigfox 物聯網網路會是一個很好幫助孩子們理解感測器與感測網路如何運作的理想方式。micro:bit 是新式以電池提供電力的感測器裝置典範,具備充足的處理能力並支援大多數的感測器類型。在教育用途上,Sigfox 可能是今日用於城市規模測試的感測網路之中,最為便宜的方案。

[Connect BBC micro:bit to Sigfox](#) in Medium

5 November 2018

BBC micro:bit connected to the Sigfox IoT network is the perfect way to help kids understand how Sensors and Sensor Networks operate. The micro:bit is a good representation of a modern battery-powered sensor device, with ample processing power and support for most types of sensors. For education, Sigfox is likely the cheapest option today for experimenting with a city-wide sensor network.

連接 STM32F103C8T6 Blue Pill 開發板與 Sigfox 物聯網 in MakerPRO
17 October 2018

以 STM32 微處理器為核心的 STM32F103C8T6 Blue Pill 開發板連接 Sigfox 收發器模組來接取 Sigfox 物聯網網路可能會是設計一款低功率物聯網裝置的最佳組合。

Connect STM32 Blue Pill to Sigfox in Medium
28 September 2018

STM32 "Blue Pill" microcontroller connected to a transceiver module for the Sigfox IoT network might be the best combination for low-power IoT devices right now.

Watch STM32 Blue Pill Juggle Two SPI Sensors With DMA in Medium
19 September 2018

This article that explains all that I have learnt about SPI ports, DMA and interrupts on the Blue Pill

Program Your First FPGA With GOWIN GW1N-4 in Medium
5 September 2018

As we learn how to program the FPGA, we'll soon realise that FPGA programming is really extraordinary, unlike any other kind of programming we have done before

Juggling STM32 Blue Pill For Arduino Jugglers in Medium
27 August 2018

Upsizing from Arduino Uno to a 32-bit STM microcontroller doesn't have to be hard

Juggling Sigfox Downlink And Arduino Sensors With cocoOS in Medium
20 August 2018

Using the cocoOS task scheduler to run Sensor Tasks concurrently while waiting for the Network and UART Tasks

Juggling Arduino Sensors With cocoOS in Medium
11 August 2018

Juggle multiple Arduino sensors, using an open source library for cooperative processing: cocoOS

Why use FPGA for IoT? Here's what I think… in Medium
31 July 2018

Since FPGAs are already mainstream, could we use them to create IoT devices that are more power-efficient than current devices based on microcontrollers?

Coding the STM32 Blue Pill with Rust and Visual Studio Code in Medium

10 July 2018

Let's learn Rust, a modern systems programming language that promotes safe, concurrent low-level coding

[Making my first ever PCB with Seeed Fusion PCB assembly service](#) in Medium
5 July 2018

Here's the story of the first gadget that I have ever created, with help from the brilliant minds at Seeed in Shenzhen

[Running Rust and FreeRTOS on the PADI IoT Stamp](#) in Medium
18 June 2018

Better tools for building robust and reliable programs for microcontrollers

[First Impressions of Alibaba Cloud (Aliyun)](#) in Medium
21 May 2018

Could Alibaba Cloud be the economical cloud for high volume IoT?

[Multitasking on the Arduino with a Finite State Machine – And why you'll need it for Sigfox Downlink](#) in Medium
13 May 2018

How to implement a Finite State Machine on the Arduino Uno

[Realtime sensor data processing with thethings.io and Amazon Web Services Kinesis](#) in Medium
1 May 2018

How to experiment with IoT today while minimising the security and performance risks, and keeping costs low

[I Teach IoT. Here's what you'll learn](#) in Medium
24 April 2018

Arduino, Low Power Networks, IoT Networks, IoT Analytics, ...

[Developing cost-effective, energy efficient IoT solutions for outdoor as well as indoor applications](#) in OpenGov
20 March 2018

Lup Yuen talks about two classes of IoT, 'deep' IoT and 'wide' IoT. Deep IoT devices require high bandwidth and power supply. UnaBiz looks at wide IoT, which refers to devices that are very light, battery-powered and operate on pervasive networks. They can work anytime, anywhere in Singapore and do not rely on WiFi or the cellular network.

[How To Build Your Sigfox Server (Version 1.0)](#) in Medium
14 October 2017

Building highly reliable, robust and scalable systems for processing Sigfox messages

[Story of the UnaShield](#) in Medium
5 July 2017

Co-created with Upton Lai, the brilliant guy who could make anything

[IoT is a Bad Word](#) in Medium
26 May 2017

IoT is about solving real problems (not imaginary ones) in a sustainable way

[Overcoming Productivity Challenges in the F&B Industry](#) in Retail World Asia 2015
23 April 2015

[Sigfox and Google Cloud Platform](#) in Google Developer Group Singapore DevFest
20 October 2014

[Patent: Enlargement of video content streamed from the internet](#) in US Patent Office WO/2012/002906
30 June 2010

This invention relates to a system for displaying video content streamed from a network in a full screen mode. The system receives receiving a network address based on a selection from a user. The system then transmits a request for content from the network address and subsequently receives the content associated with the network address. A search is performed on the content for data that provides displaying a video content in a full screen mode. Upon detecting the data, the process generates the data and displays video content in full screen mode.

[Patent: A system and method for providing mobile services](#) in US Patent Office WO/2008/004981
27 June 2007

A system and method for providing mobile services, the system comprising: a mobile device executing a client application for generating a mobile service request; and a hub server for receiving and processing the mobile service request, wherein the mobile service request comprises location data of the mobile device, and the hub server pushes one or more mobile service offers to the mobile device based on the location data. The method comprises executing a client application for generating a mobile service request on a mobile device; receiving and processing the mobile service request at a hub server; and pushing one or more mobile service offers from the hub server to the mobile device based on location data, wherein the mobile service request comprises location data of the mobile device.

LANGUAGES

English   Mandarin   Cantonese

Native speaker   Native speaker   Fluent

How was this JSON
Resume created?
https://github.com/lupyuen/lupyu
en.github.io

Native speaker   Native speaker   Fluent