

LEE Lup Yuen

Techie and Educator in IoT

Singapore SG

Born in 1969

<https://lupyuen.github.io> luppy@appkaki.com

[in lupyuen](#) [lupyuen](#) [mistertechblog](#) [Download PDF](#) [JSON](#)



Hands-on IoT advisor and educator. Passionate about helping everyone create IoT products that make a difference to the man and woman on the street. 'Top Writer In Internet of Things' at medium.com

SKILLS

Internet of Things (IoT)

Master

[nb-iot](#) | [sigfox](#) | [loras](#) | [aws iot](#) |
[google cloud iot](#) | [azure iot](#) | [thethings.io](#) |
[ubidots](#) | [embedded rust](#) | [embedded c](#) |
[arduino](#) | [stm32](#) | [blue pill](#) | [esp8266](#) |
[nrf24l01](#)

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

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.

- Operating Systems: He conducted tutorials and labs for the Operating Systems core subject, which is a graduation requirement for all fulltime students. He covered a broad range of operating systems including Android, iOS, Linux and Windows.

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.

- UnaLocation - Enhanced Sigfox Geolocation: Estimates your latitude/longitude geolocation from Sigfox signal strength. Computed based on past GPS coordinates and Sigfox signal strength collected by the UnaTumbler tracking device. Machine Learning based on Google TensorFlow, Google BigQuery, AWS SageMaker
- UnaRadar - Sigfox Network Finder: Mobile web tool for showing the locations of nearby Sigfox basestations and their signal strengths with respect to your Sigfox device.
- UnaMap - Sigfox Coverage Map: Web-based coverage map, computed based on past GPS coordinates and Sigfox signal strength collected by the UnaTumbler tracking device.
- UnaShield - Sigfox Shield for Arduino: Arduino library that powers the communication between UnaShield and Sigfox - <https://github.com/UnaBiz/unabiz-arduino>
- UnaBell - Smart Button on Sigfox: Cloud server that powers the smart button
- sigfox-gcloud - Open Source Sigfox Server for Google Cloud: <https://github.com/UnaBiz/sigfox-gcloud>
- sigfox-aws - Open Source Sigfox Server for Amazon Web Services: <https://github.com/UnaBiz/sigfox-aws>

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. Projects executed include:

- Straight-Through Food & Beverage (F&B) Ordering System: Deployed in Singapore and Australia, he created the system that allows mobile users to place food orders through a mobile app and submit directly to the Point Of Sales System and the Kitchen Display System. The Kitchen Display System automatically calls the user when the order is ready for collection. Loyalty points and digital receipts are automatically populated in the app, through direct integration with the Lavu Point Of Sales system. Tools and platforms used: AWS (Lambda, S3, SQS, API Gateway, Mobile Analytics), Google BigQuery, Firebase, Parse, Magento 2, Loggly, Sumo Logic, Jenkins, Raygun, Slack, Azure, MongoDB, Node.js, Android, iOS (Swift), C#, Windows Presentation Foundation.
- Bluetooth Beacon Analytics: Profiling mobile users accurately using Bluetooth Beacon analytics and targeting them with highly-relevant promotions. Tested in large exhibitions and shopping malls. Based on Google BigQuery, Google Cloud Datalab, MongoDB, Node.js, Android, iOS.

- Other projects include Health/Wellness, Android Set-Top Boxes, Hospitality

Chief Technology Officer at SingTel LifeLabs June 2009- November 2014

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

Reports directly to CEO Group Digital Life, 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. Projects executed include:

- (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

[Safer, Simpler Embedded Programs with Rust on RIOT](#) 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 GitHub

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 GitHub

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 GitHub

25 July 2020

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

[Flutter State Management with Bloc for PineTime Companion App](#) in GitHub

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 GitHub

19 June 2020

Getting started with PineTime Smart Watch

[Your First GTK App with Go and VSCodium](#) in GitHub

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 GitHub

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 GitHub

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 GitHub

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 GitHub

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 GitHub

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 GitHub

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 GitHub

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 GitHub

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 Medium

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 Medium

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 Medium

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 Medium

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 Medium

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 Medium

14 December 2019

Code Watch Apps in Rust the Declarative Way

[My 5-Year IoT Mission](#) in Medium

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 Medium

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 Medium

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 Medium

15 November 2019

PineTime is the spiritual successor to BBC micro:bit

[Porting Apache Mynewt OS to GigaDevice GD32 VF103 on RISC-V](#) in Medium

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 Medium

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 Medium

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 Medium

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 Medium

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 Medium

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 Medium

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 Medium

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 Medium

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 Medium

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 Medium

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 Medium

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 Medium

9 June 2019

[Build Your IoT Sensor Network—STM32 Blue Pill + nRF24L01 + ESP8266 + Apache Mynewt + \[thethings.io\]\(#\)](#) in Medium

27 May 2019

[Super Blue Pill—Like STM32 Blue Pill, But Better!](#) in Medium

21 May 2019

[Connect STM32 Blue Pill to ESP8266 with Apache Mynewt](#) in Medium

20 April 2019

[Create your IoT gadget with Apache Mynewt and STM32 Blue Pill](#) in Medium

26 March 2019

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

10 March 2019

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

8 March 2019

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

6 March 2019

[STM32 Blue Pill—Bootloading the WebUSB Bootloader](#) in Medium

25 February 2019

[STM32 Blue Pill—Dissecting the WebUSB Bootloader for MakeCode](#) in Medium

16 February 2019

[STM32 Blue Pill — Unit Testing with Qemu Blue Pill Emulator](#) in Medium

7 February 2019

[STM32 Blue Pill – Shrink your math libraries with Qfplib](#) in Medium

30 January 2019

[STM32 Blue Pill—Analyse and Optimise Your RAM and ROM](#) in Medium

24 January 2019

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

18 December 2018

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

9 December 2018

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

7 December 2018

[以 thethings.io 來將 BBC micro:bit 感測器圖形化](#) in Medium

29 November 2018

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

17 November 2018

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

13 November 2018

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

5 November 2018

[連接 STM32F103C8T6 Blue Pill 開發板與 Sigfox 物聯網](#) in Medium

17 October 2018

[Connect STM32 Blue Pill to Sigfox](#) in Medium

28 September 2018

[Watch STM32 Blue Pill Juggle Two SPI Sensors With DMA](#) in Medium

19 September 2018

[Program Your First FPGA With GOWIN GW1N-4](#) in Medium

5 September 2018

[Juggling STM32 Blue Pill For Arduino Jugglers](#) in Medium

27 August 2018

[Juggling Sigfox Downlink And Arduino Sensors With cocoOS](#) in Medium

20 August 2018

[Juggling Arduino Sensors With cocoOS](#) in Medium

11 August 2018

[Why use FPGA for IoT? Here's what I think...](#) in Medium

31 July 2018

[Coding the STM32 Blue Pill with Rust and Visual Studio Code](#) in Medium

10 July 2018

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

5 July 2018

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

18 June 2018

[First Impressions of Alibaba Cloud \(Aliyun\)](#) in Medium

21 May 2018

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

13 May 2018

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

1 May 2018

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

24 April 2018

[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

[Story of the UnaShield](#) in Medium

5 July 2017

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

26 May 2017

[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

Native speaker

Mandarin

Native speaker

Cantonese

Fluent

How was this JSON

Resume created?

<https://github.com/lupyuen/lupyuen.github.io/blob/master/README.md>