Devices, Hacking Hardware, and Robotics With GNU/Linux

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Sipeed Lichee RV RISC-V module gets $5+ carrier board with HDMI and USB ports, optional WiFi - CNX Software [4]

Sipeed introduced the Lichee RV Allwinner D1 Linux RISC-V board going for just $17 with 512MB RAM last month. While with a USB-C port it could be used as a standalone part, its dual M.2 connector makes it more like a module and we noted a tiny carrier board was in the works at the time.

The baseboard is now available and known as the Lichee RV Dock adding HDMI and USB ports, as well as a 40-pin GPIO header for just $5, or $8 if you'd like to get Wi-Fi 4 and Bluetooth 4.2 connectivity through a Realtek RTL8723DS module.

CH583 RISC-V microcontroller supports Bluetooth 5.3 LE - CNX Software [5]

Following up on the CH572 RISC-V BLE microcontroller with 10KB SRAM, WCH has now introduced the CH583 RISC-V microcontroller with 32KB SRAM, 1 MB flash, and support
for the latest Bluetooth 5.3 LE standard.

The new microcontroller also offers a wide range of peripherals with two USB host/device interfaces, up to 40 GPIOs, four UART, two SPI, one I2C, up to 14 ADC interfaces, and more. WCH also offers CH581 and CH582 microcontrollers with a different minimum input voltage, less storage (256KB for CH581) and/or peripherals.

* Indoor positioning BU01 development board can detect tiny body movements - CNX Software [6] *

GPS is available for outdoor positioning, what about indoors? There is a positioning technology that is more accurate than GPS: UWB. The technology offers positioning accuracy within 10cm which greatly compensates for the shortcomings of the indoor RSSI positioning of past IoT products.

* ESP32 Pretends To Be GPU; Gives You A Ransomware Scare | Hackaday [7] *

Sometimes a piece of hardware meets a prank idea, and that?s how the fun Hackaday articles are born. [AnotherMaker] shows us some harmless entertainment at the expense of an IT enthusiast in your life? programming an ESP32-powered devboard with a VGA output to show an ever-feared ?all your files are encrypted? screen on a monitor connected to it. The ASCII text in its 8-bit glory helps sell this prank, making it look exactly like a BIOS-hijacking piece of malware it claims to be; akin to UIs of the past that skilled hackers would whip up in x86 assembly. The devboard?s integration into a PCI card backplate is a cherry on top, a way to seamlessly integrate this into a PC case, making it look not particularly different from an old graphics card. In such a configuration, we don?t doubt that this would be a head-scratcher to a certain kind of an IT department worker.

* Some predictions for the year ahead [8] [Ed: Takes note of the role of GNU/Linux in robotics] *

Robotics processor vendors will increasingly offer Robot Operating System (ROS)-based solutions for hardware acceleration across the entirety of robotics offerings.

This should help tackle the problem of system integration and entice developers to adopt more off-the-shelf processors and hardware.

Furthermore, the hardware-software optimization will provide a set of benchmarks and standards for the field, which is fairly fragmented at the moment, accelerating the time-to-market.

As a total of 45,000 cobots and 452,000 mobile robots are expected to be shipped in 2022, a
65 percent and 51 percent Y-o-Y growth, end users are expected to benefit from the tighter integration.

What will not happen in 2022 includes:

The democratization of robotics expertise

While the emergence of ROS and various robotics startups will offer real advances in the short term, robotics as a whole suffers from a significant shortage in expertise.

In the long run, this will have an adverse effect on development and commercialization. Considerable investment in resource- and time-intensive areas requiring experts from different fields is badly needed, but this will not happen anytime soon.

GNU Linux Hardware

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