EMBEDDED PROCESSING FEATURE

RISC-V: Too Open to Succeed
BRANDON LEWIS, EDITOR-IN-CHIEF

Earlier this year, I wrote a column entitled “RISC-V: Too Open to Fail” in which I outlined several reasons why the open hardware initiative will be a success. Now it’s time to look at a few reasons the technology could fail. And they start with the fact that RISC-V is open source.

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AI & MACHINE LEARNING FEATURE

When Do I Use Machine Learning or Deep Learning?
SETH DELAND, MATHWORKS

Understanding which AI technologies to use to advance a project can be challenging given the rapid growth and evolution of the science. This article outlines the differences between machine learning and deep learning, and how to determine when to apply each one.

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DEV KIT WEEKLY: HARDWARE REVIEW & RAFFLE

Dev Kit Weekly: Thundercomm TurboX AI Kit
WITH BRANDON LEWIS, EDITOR-IN-CHIEF

This week we review the Thundercomm TurboX AI Kit, which is based on the Thundercomm TurboX module, which is based on the Qualcomm SDA845 heterogeneous SoC, which is based on... just kidding. Kinda.

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AUTOMOTIVE HMI FEATURE

Designing ISO 26262-Compliant HMI Graphics and Storage for Automotive Clusters

PRITESH MANDALIYA AND MARTIN OBERK?NIG, CYPRESS SEMICONDUCTOR

Automotive clusters, which must display critical information from various sensors and actuators in the car, must meet the ASIL B standard. There is some cluster display information, such as brake, telltales, and transmission gear selector (PRNDL) images that must also follow the ISO 26262 functional safety standard.

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EMBEDDED TOOLBOX VIDEO INTERVIEW SERIES

Embedded Toolbox: GUIs, GUIs Everywhere with Qt for MCUs

WITH AURINDAM JANA, THE QT COMPANY

Qt recently announced Qt for MCUs, a lightweight GUI development environment that uses the familiar QML language but compresses the executables into packages that can run on 32-bit micros. It currently supports MCU offerings from ST Microelectronics, NXP, and Renesas, and provides demos for applications like touchscreen thermostats and vehicle instrumentation clusters.

Tune in for More +
Many people claim that analog is a dying technology. David Dwelley, Vice President and Chief Technology Officer at Maxim Integrated, has a birds-eye view on state-of-the-art analog design.

Tune in for More +

**POWER ELECTRONICS FEATURE**

**The Fundamentals of Transimpedance Amplifiers**

BONNIE C BAKER, MAXIM INTEGRATED

I'm surprised how often transimpedance amplifiers (TIA) and associated circuits keep coming back into our analog designers' conversations. Medical photosensing applications demand a high level of analog precision and accuracy. Several circuits tackle the photosensing task; however, I am going to focus on the basics. The primary analog photosensing or the TIA circuit provides a wealth of information that will carry through to your next light-sensing circuit design.

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**POWER ELECTRONICS FEATURE**

**Bus Bars: The 3D Solution to Excessive IR Power-Rail Drop**

BILL SCHWEBER, JAFFA ENGINEERING

Despite the widespread use of low-power ICs ? or counterintuitively, because of it ? DC power-rail currents on PC boards keep increasing. It's not unusual to have a modest-size board drawing high tens of amps and even more. Getting rid of the resultant I2R heat is a well-known thermal problem, but there's a problem which comes before that consequence: delivering the nominal rail voltage to the load without excessive voltage drop due to PC board track resistance.

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EMBEDDED SECURITY FEATURE

Addressing the Increased Need for Hardware Security

ALIX PAULTRE, SENIOR TECHNOLOGY EDITOR

Where it was once acceptable to address security almost completely with software, it has gotten to the point where the device itself has to be intrinsically secure. One of the emerging solutions is based on the concept of Hardware Root-of-Trust, where you have a device that can securely boot itself, forming the foundation for security in the rest of the system.

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Machine learning (ML) algorithms are moving processing to the IoT device due to challenges with latency, power consumption, cost, network, bandwidth, reliability, security, and more.

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To be successful in this increasingly digital world, organizations need the infrastructure and technology to be capable of delivering and storing data and analytics in a fast, secure and efficient way.

Hear Failure from Miles Away
NATIONAL INSTRUMENTS

Experienced maintenance professionals can understand if a machine is healthy or not by walking up to it and using their senses — hearing, touch, smell, and sight. But, this skill doesn’t scale when there are more plants than experts. This short-read paper — a TechINSIGHT — shows how IoT maintenance solutions are helping machine analysts be in multiple places at once. It includes recordings of a failing bearing so you can hear for yourself.