Embedded COMPUTING DESIGN
May E-Letter

National Instruments platforms and tools evolve for IIoT developers of all skill levels


Brandon Lewis, Technology Editor

Almost 31 years ago National Instruments (NI) introduced LabVIEW, one of the first visual programming languages and design environments for system development. As Jeff Kodosky, a co-founder, technology fellow, and the “father of LabVIEW” at NI explained at this week’s NIWeek in Austin, TX, “In the beginning, we were just aiming to help engineers [...]

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Making the leap from Arduino to Raspberry Pi: Initial use experience


Jeremy Cook, Engineering Consultant

As mentioned in my last article, I have a decent amount of experience with Arduino boards, and quite a bit more with industrial programmable logic controllers (PLCs), but until now I haven’t actually sunk my teeth into the Raspberry Pi. Now that I have one of these boards, it was time to actually give it a try.

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3D printing car parts is a potential boon to auto industry


Rudy Ramos, Mouser

Car manufacturers and designers are already familiar with 3D printing because they've been using it for prototyping for decades. But will the technology ever be a practical way to mass-manufacture vehicles? For drivers, perhaps the ultimate sci-fi 3D printing dream would be to view a few cars on a screen, choose one, and tweak the [...]

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Bulls, bears, and bunnies: The 6th RISC-V Workshop in Shanghai


Larry Lapides, Imperas

Last week, I attended the 6th RISC-V Workshop, held in Shanghai. RISC-V is, of course, the open-source processor architecture invented and introduced by the University of California, Berkeley in 2014. The previous workshop, held last November in Silicon Valley, attracted around 350 participants; this workshop about the same. The majority of attendees were from Asia, [...]

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Is the EdgeX Foundry right for everyone?


Rich Nass, Embedded Computing Brand Director

Is there a need for IoT interoperability? I guess it depends on your perspective, but in most cases, the answer would be yes. If you're a little guy, it's obvious why it's a good thing—your parts are compatible with lots of other systems. If you're a big guy, it's less obvious because you generally have [...]

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Ada competition: Look who's a judge!


Rich Nass, Embedded Computing Brand Director

I just became the proverbial kid in a candy store (hey, you have your candy and I have mine). AdaCore just launched its second-annual Make with Ada programming competition, and I get to be one of the judges. Contestants use the Ada programming language in building their project and have the chance to win cash [...]

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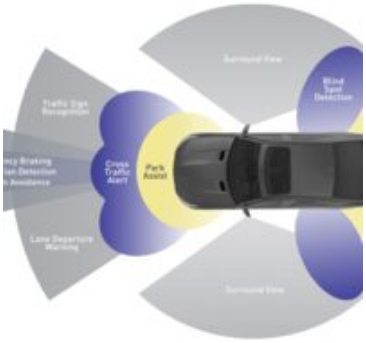

Ensuring functional safety in embedded software

Franz Maidl, Altium

For those of us in the automotive segment of embedded software, the success – or failure – of our companies depends heavily on meeting safety requirements. If we do not develop code using proven development methods to ensure safety, at best we will go out of business; at worst, we could cause destruction of property, injury, or even death. As automobiles evolve toward autonomously driven vehicles, functional safety of hardware and software is the…

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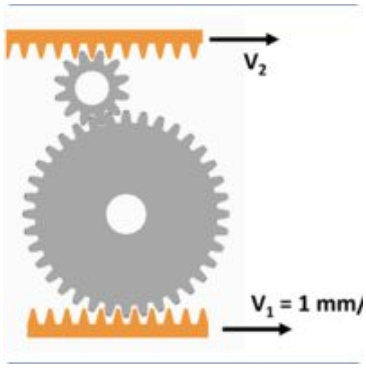

DESIGN ARTICLES

Appropriate models for 3D motion analysis

Josh Siegel, Simplexity Product Development

Embedded motion engineers have to know how the smart electronics get placed within the physical structure (“embedded”) and how each component moves relative to each other (“motion”). In this article, I’d like to discuss how we describe and model the latter term, motion, which we often take for granted as being quite simple.

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Doing binary

Colin Walls Mentor Graphics Embedded Systems Division

When thinking about this blog, I was reminded of an old joke: There are 10 kinds of people in the world: those who understand binary and those who do not. Sorry, but it still makes me smile. Embedded developers often need to work “close to the hardware.” Stated another way, the [...]

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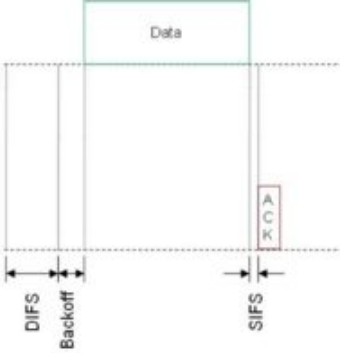

DESIGN ARTICLES

Enabling the IoT, part 2: Coexistence – living in the same neighborhood


Sachin Gupta, Cypress Semiconductor

The number of IoT devices is growing exponentially and making the usable frequency spectrum busier than before. Wi-Fi, Bluetooth, and ZigBee operate in the unlicensed 2.4-GHz (2.4 GHz to 2.4835 GHz) Industrial Scientific and Medical (ISM) band. Bluetooth and Wi-Fi are almost non-competing technologies. Each of these have their own applications based on their merits. Many IoT applications require both be present in the same network. Some applications even require both of these technologies…

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Open source vulnerabilities pose a serious risk for software startups


Justin Blanchard, Server Mania

A recently published report from Black Duck Software revealed that a surprising number of applications contain high-risk vulnerabilities in their open source components.

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DESIGN ARTICLES

Four tips for assessing BLE module data sheets


Jonathan Kaye, Laird

Bring some salt. Bring a lot of salt, actually. You're going to need it if you're working on a product design and need to select a Bluetooth module from the stack of data sheets trying their darnedest to get you to pick their solution. There's a reason these aren't called "fact sheets." These are sales materials first and foremost, and you need to take their claims with a grain of salt – or sometimes…

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Embedded Insiders Podcast: Is RISC-V risky business?

 Rich Nass, Embedded Computing Brand Director *and*  Brandon Lewis, Technology Editor

Researchers at Princeton recently found memory consistency errors in the RISC-V instruction set architecture (ISA), an extensible, open-source ISA spawned out of academia that is being adopted by industry in the development of everything from Internet of Things (IoT) microcontrollers (MCUs) to data center processors. While certain media outlets have sensationalized these findings, the Embedded Insiders ask Rick O'Connor, Executive Director of the RISC-V Foundation for the real scoop. As you'll hear, there are…

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Safety, security, and source code for industrial embedded systems: No shortcuts

 Brandon Lewis, Technology Editor

For English-speaking embedded engineers the term “safety,” as in functional safety, is used to imply the reliable and deterministic operation of electronic systems, particularly those capable of harming human beings. The term security, on the other hand, is used to describe safeguards present in an electronic system to protect it and its data against software-borne, [...]

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Letting go of the wheel: Can humans do it?

 Shawn Andreassi, SAE International

This article is the fourth of a six-article series from SAE International providing a practical look into the feasibility of connected vehicles and autonomous driving. Read the first, second, and third articles.

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zigbee’s dotdot makes IoT edge devices interoperable with multiple RF connectivity support


Prima Saraiya, Volansys Technologies

The zigbee alliance recently introduced dotdot, a universal language for the Internet of Things (IoT) that works on the application layer to enable communication across different networking technologies. It can be seen as an extension of the zigbee Cluster Library (ZCL) specification used to issue commands across zigbee 3.0’s interoperable application layer. In addition to the application layer remaining slim, [...]

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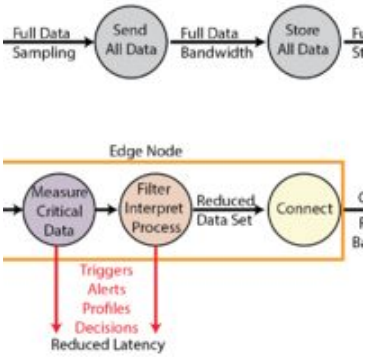

DESIGN ARTICLES

Innovation in sensor analytics at the edge


Ian Beavers, Analog Devices

The Industrial Internet of Things (IIoT) revolution is in full development as industrial providers continue integrating smart connected solutions into their existing operations. A high level challenge is that many IIoT solutions are tasked with capturing and moving massive amounts of data from a myriad of sensors to the cloud. Often, this creates an inadvertent crippling effect from a bottleneck deluge of raw data. With a dumb sensor approach, the typical “send everything to…

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WHITE PAPER

Architectures for Implementing a Hardware in the Loop System

Staff, National Instruments

Safety, availability, or cost considerations can make it impractical to perform all the necessary tests with the complete embedded control system. Using hardware-in-the-loop (HIL) simulation, you can simulate the parts of the system that pose these challenges. By thoroughly testing the embedded control device in a virtual environment before proceeding to real-world tests of the complete system, you can maintain reliability and time-to-market requirements in a cost-effective manner even as the systems you are testing…

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