Hardware Firmware Interface Design Best Practices For Improving Embedded Systems Development

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These interfaces are critical, a solid hardware design married with adaptive firmware can access all the capabilities of an application and overcome limitations caused by poor communication. For the first time, a book has come along that will help hardware engineers and firmware engineers work together to mitigate or eliminate problems that occur when hardware and firmware are not optimally compatible.

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Hardware/Firmware Interface Design: Best Practices for Improving Embedded Systems Development. Why care about hardware/firmware interaction? These interfaces are critical, a solid hardware design married with adaptive firmware can access all the capabilities of an application and overcome limitations caused by poor communication. For the first time, a book has come along that will help hardware engineers and firmware engineers work together to mitigate or eliminate problems that occur when ...

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Hardware/Firmware Interface Design Best Practices for Improving Embedded Systems Development Gary Stringham AMSTERDAM † BOSTON † HEIDELBERG † LONDON NEW YORK † OXFORD † PARIS † SAN DIEGO SAN FRANCISCO † SINGAPORE † SYDNEY † TOKYO Newnes is an imprint of Elsevier.

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The hardware specification written by hardware engineers with details about the bits and registers forming the hardware/ firmware interface is the most valuable tool for firmware engineers. They have to have this to correctly code up the firmware. Of course, it goes without saying that this specification must be complete and correct.

~~Basics of hardware/firmware interface codesign - Embedded.com~~

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~~Hardware/Firmware Interface Design - 1st Edition~~

Book: Hardware/Firmware Interface Design Gary has authored a book with practical concepts that can be used while designing ASICs, ASSPs, SoCs, and FPGAs which will solve many firmware programming issues and help avoid chip respins. It contains over 300 best practices, some of which have been discussed in his newsletters.

~~Book: Hardware/Firmware Interface Design - Gary Stringham ...~~

To get the best mix of hardware and on-screen, digital controls, product developers need to reunite UI design with engineering and industrial design processes — ideally within the Design Thinking framework. This requires two major shifts in process thinking: Merge Development Timelines. Bridging the agile development process of UI and the linear stage-gate process of hardware design is challenging, but it can be done by forcing a more iterative process.

~~A Plan for Integrating Hardware and Software - Bresslergroup~~

Firmware is just a special kind of software that serves a very narrow purpose for a piece of hardware. While you might install and uninstall software on your computer or smartphone on a regular basis, you might only rarely, if ever, update the firmware on a device and you'd probably only do so if asked to by the manufacturer, probably to fix a ...

~~Hardware vs Software vs Firmware: What's the Difference?~~

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~~Hardware/Firmware Interface Design [Book]~~

In this workshop, we present approximately 300 best practices of hardware/firmware interface design and explore the fundamental principles underlying them. We teach engineers how to customize and adapt these best practices for your specific development processes. Your engineers will emerge from the workshop with a set of best practices tailored to your environment.

~~Hardware Firmware Interface Design - Barr Group~~

User interface is part of software and is designed such a way that it is expected to provide the user insight of the software. UI provides fundamental platform for human-computer interaction. UI can be graphical, text-based, audio-video based, depending upon the underlying hardware and software combination.

~~Software User Interface Design - Tutorialspoint~~

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Why care about hardware/firmware interaction? These interfaces are critical, a solid hardware design married with adaptive firmware can access all the capabilities of an application and overcome limitations caused by poor communication. For the first time, a book has come along that will help hardware engineers and firmware engineers work together to mitigate or eliminate problems that occur when hardware and firmware are not optimally compatible. Solving these issues will save time and money, getting products to market sooner to create more revenue. The principles and best practices presented in this book will prove to be a valuable resource for both hardware and firmware engineers. Topics include register layout, interrupts, timing and performance, aborts, and errors. Real world cases studies will help to solidify the principles and best practices with an aim towards cleaner designs, shorter schedules, and better implementation! Reduce product development delays with the best practices in this book Concepts apply to ASICs, ASSPs, SoCs, and FPGAs Real-world examples and case studies highlight the good and bad of design processes

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This book provides an overview of modern boot firmware, including the Unified Extensible Firmware Interface (UEFI) and its associated EFI Developer Kit II (EDKII) firmware. The authors have each made significant contributions to developments in these areas. The reader will learn to use the latest developments in UEFI on modern hardware, including open source firmware and open hardware designs. The book begins with an exploration of interfaces exposed to higher-level software and operating systems, and commences to the left of the boot timeline, describing the flow of typical systems, beginning with the machine restart event. Software engineers working with UEFI will benefit greatly from this book, while specific sections of the book address topics relevant for a general audience: system architects, pre-operating-system application developers, operating system vendors (loader, kernel), independent hardware vendors (such as for plug-in adapters), and developers of end-user applications. As a secondary audience, project technical leaders or managers may be interested in this book to get a feel for what their engineers are doing. The reader will find: An overview of UEFI and underlying Platform Initialization (PI) specifications How to create UEFI applications and drivers Workflow to design the firmware solution for a modern platform Advanced usages of UEFI firmware for security and manageability

Embedded Firmware Solutions is the perfect introduction and daily-use field guide--for the thousands of firmware designers, hardware engineers, architects, managers, and developers--to Intel’s new firmware direction (including Quark coverage), showing how to integrate Intel® Architecture designs into their plans. Featuring hands-on examples and exercises using Open Source codebases, like Coreboot and EFI Development Kit (tianocore) and Chromebook, this is the first book that combines a timely and thorough overview of firmware solutions for the rapidly evolving embedded ecosystem with in-depth coverage of requirements and optimization.

Interested in developing embedded systems? Since they don’t tolerate inefficiency, these systems require a disciplined approach to programming. This easy-to-read guide helps you cultivate a host of good development practices, based on classic software design patterns and new patterns unique to embedded programming. Learn how to build system architecture for processors, not operating systems, and discover specific techniques for dealing with hardware difficulties and manufacturing requirements. Written by an expert who’s created embedded systems ranging from urban surveillance and DNA scanners to children’s toys, this book is ideal for intermediate and experienced programmers, no matter what platform you use. Optimize your system to reduce cost and increase performance Develop an architecture that makes your software robust in resource-constrained environments Explore sensors, motors, and other I/O devices Do more with less: reduce RAM consumption, code space, processor cycles, and power consumption Learn how to update embedded code directly in the processor Discover how to implement complex mathematics on small processors Understand what interviewers look for when you apply for an embedded systems job "Making Embedded Systems is the book for a C programmer who wants to enter the fun (and lucrative) world of embedded systems. It’s very well written—entertaining, even—and filled with clear illustrations." —Jack Ganssle, author and embedded system expert.

Intelligent readers who want to build their own embedded computer systems-- installed in everything from cell phones to cars to handheld organizers to refrigerators-- will find this book to be the most in-depth, practical, and up-to-date guide on the market. Designing Embedded Hardware carefully steers between the practical and philosophical aspects, so developers can both create their own devices and gadgets and customize and extend off-the-shelf systems. There are hundreds of books to choose from if you need to learn programming, but only a few are available if you want to learn to create hardware. Designing Embedded Hardware provides software and hardware engineers with no prior experience in embedded systems with the necessary conceptual and design building blocks to understand the architectures of embedded systems. Written to provide the depth of coverage and real-world examples developers need, Designing Embedded Hardware also provides a road-map to the pitfalls and traps to avoid in designing embedded systems. Designing Embedded Hardware covers such essential topics as: The principles of developing computer hardware Core hardware designs Assembly language concepts Parallel I/O Analog-digital conversion Timers (internal and external) UART Serial Peripheral Interface Inter-Integrated Circuit Bus Controller Area Network (CAN) Data Converter Interface (DCI) Low-power operation This invaluable and eminently useful book gives you the practical tools and skills to develop, build, and program your own application-specific computers.

Authored by two of the leading authorities in the field, this guide offers readers the knowledge and skills needed to achieve proficiency with embedded software.

Quick Boot is designed to give developers a background in the basic architecture and details of a typical boot sequence. More specifically, this book describes the basic initialization sequence that allows developers the freedom to boot an OS without a fully featured system BIOS. Various specifications provide the basics of both the code bases and the standards. This book also provides insights into optimization techniques for more advanced developers. With proper background information, the required specifications on hand, and diligence, many developers can create quality boot solutions using this text. Pete Dice is Engineering Director of Verifone, where he manages OS Engineering teams in Dublin, Ireland and Riga Latvia. Dice successfully launched Intel(R) Quark(TM), Intel's first generation SoC as well as invented the Intel(R) Galileo(TM) development board and developed a freemium SW strategy to scale Intel IoT gateway features across product lines. He is also credited with architecting the "Moon Island" software stack and business model.

Gain the knowledge and skills necessary to improve your embedded software and benefit from author Jacob Beningo’s more than 15 years developing reusable and portable software for resource-constrained microcontroller-based systems. You will explore APIs, HALs, and driver development among other topics to acquire a solid foundation for improving your own software. Reusable Firmware Development: A Practical Approach to APIs, HALs and Drivers not only explains critical concepts, but also provides a plethora of examples, exercises, and case studies on how to use and implement the concepts. What You'll Learn Develop portable firmware using the C programming language Discover APIs and HALs, explore their differences, and see why they are important to developers of resource-constrained software Master microcontroller driver development concepts, strategies, and examples Write drivers that are reusable across multiple MCU families and vendors Improve the way software documented Design APIs and HALs for microcontroller-based systems Who This Book Is For Those with some prior experience with embedded programming.

The new RISC-V Edition of Computer Organization and Design features the RISC-V open source instruction set architecture, the first open source architecture designed to be used in modern computing environments such as cloud computing, mobile devices, and other embedded systems. With the post-PC era now upon us, Computer Organization and Design moves forward to explore this generational change with examples, exercises, and material highlighting the emergence of mobile computing and the Cloud. Updated content featuring tablet computers, Cloud infrastructure, and the x86 (cloud computing) and ARM (mobile computing devices) architectures is included. An online companion Web site provides advanced content for further study, appendices, glossary, references, and recommended reading. Features RISC-V, the first such architecture designed to be used in modern computing environments, such as cloud computing, mobile devices, and other embedded systems Includes relevant examples, exercises, and material highlighting the emergence of mobile computing and the cloud