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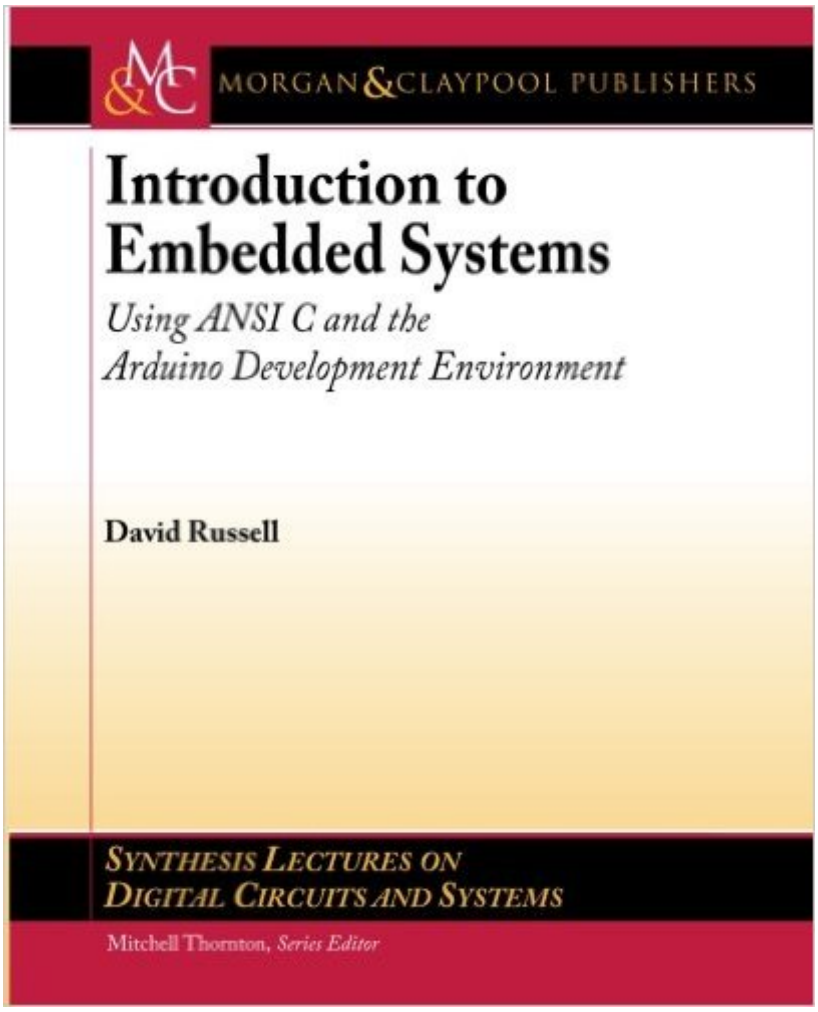
Introduction To Embedded Systems: Using ANSI C And The Arduino Development Environment (Synthesis Lectures On Digital Circuits And Systems)



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Synopsis

Many electrical and computer engineering projects involve some kind of embedded system in which a microcontroller sits at the center as the primary source of control.The recently-developed Arduino development platform includes an inexpensive hardware development board hosting an eight-bit ATMEL ATmega-family processor and a Java-based software-development environment. These features allow an embedded systems beginner the ability to focus their attention on learning how to write embedded software instead of wasting time overcoming the engineering CAD tools learning curve. The goal of this text is to introduce fundamental methods for creating embedded software in general, with a focus on ANSI C. The Arduino development platform provides a great means for accomplishing this task. As such, this work presents embedded software development using 100% ANSI C for the Arduino's ATmega328P processor.We deviate from using the Arduino-specific Wiring libraries in an attempt to provide the most general embedded methods. In this way, the reader will acquire essential knowledge necessary for work on future projects involving other processors. Particular attention is paid to the notorious issue of using C pointers in order to gain direct access to microprocessor registers, which ultimately allow control over all peripheral interfacing.Table of Contents: Introduction / ANSI C / Introduction to Arduino / Embedded Debugging / ATmega328P Architecture / General-Purpose Input/Output / Timer Ports / Analog Input Ports / Interrupt Processing / Serial Communications / Assembly Language / Non-volatile Memory

Book Information

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Customer Reviews

Excellent ref. book for an intro. to embedded systems. Book is well organized andhas plenty of pictures and diagrams and explains the C programming language asit applies to Arduino micro controllers.

This book is perfect for those that have a good background in programming (e.g. in C/C++ or Java) and are new to embedded systems. The book introduces readers to the Arduino microcontroller (a wonderful teaching tool in itself - see [...]) and its functionality. The author gives clear, concise explanations and helpful examples. While readers are learning how to operate the Arduino microcontroller, they will develop knowledge and skills that are applicable to *any* embedded system. (A wonderful goal that the author explicitly mentions early on).As mentioned in a previous comment, readers will need to be open to experimenting, doing some minor research on their own, and buying a few basic electronic parts (e.g. jumper cables, resistors, capacitors, 7-segment LED, multimeter) to complete the exercises at the end of each chapter. Far from a drawback though, I've found these exercises to be appropriately challenging / stretching. The problems actually reminded me of small projects I did in my undergraduate comp. sci. courses (which were also well designed and insightful).I cannot recommend this book enough. Its clear, insightful explanations and excellent use of a wonderful electronic teaching tool (the Arduino microcontroller - $30) make this text an invaluable resource for those interested in learning the basics of embedded systems programming.

This book along with the You Tube by PAZ is one way to get a top level electronics education at a minimal cost. I am getting old and have worked with electrical controls all my life but still like to learn what is new. This book and video cover a lot of ground that is difficult to get one book and video at a time.Great Job PAZ!!!!

This book is exactly what I've been looking for, if you have a decent understanding of electronics and programming and want to put the two together, this book is for you. Its straight to the point and read much like a lecture, which for me was great. The only issue I have with this book is that at the end of each chapter there are questions like a text book, unfortunately there is no answer key in the book, kind of leaves you wondering if you were right or not. Still minus that one part, it's a great book.

This text book introduction to embedded systems using Ansi C along with the Arduino Micro

computer is excellent. The text is well written and thought out. I highly recommend this no nonsense book. The order of topic discussion is easier to read than most text books and computer language texts. It explains data architecture and the micro computer architecture very efficiently and clearly. The order of topic discussion is logical and easy to follow.

This book is a competent treatment of the subject. Without frills, it pragmatically takes you through a hobbyist understanding of Arduino and programming to the fundamentals that would useful towards learning embedded systems.

Exactly what I excepted! Well written. Covers the topic in the prefect blend of technical detail and instruction.

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