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A Trio of New Embedded Books

Regular readers may know that I've always been fond of John Hart's "Computer Approximations", the mother of all references about creating floating point approximations to trig and other complicated functions. Sadly, it's been out of print for some time, though most decent university libraries will have a copy. Amazon also claims they can find used copies occasionally. Mine's for sale… for $100,000!

Jack Crenshaw, venerable columnist for Embedded Systems Programming, has a new book that covers some of Hart's territory. "MATH Toolkit for REAL-TIME Programming" (ISBN 1-929629-09-5) is in many ways a collection of his very popular columns, with some new background material. Crenshaw's book is a very readable description of how one goes about creating an approximation to a function. He covers a few particular functions in detail, like the sine, log, arctangent and square root.

Most of us who went through engineering school once knew this stuff, but likely forgot the details immediately after the final exam. I find Crenshaw's explanations infinitely more understandable than that of my profs, and a lot more interesting.

I highly recommend this book for anyone trying to remember how curve fitting works, or who needs to create approximations to complex functions. It's not a cookbook like Hart's volume; rather, this is a guide to creating your own approximations.

Since every embedded product today seems to require Internet connectivity (toasters? don't laugh – I've seen microwaves and refrigerators connected to the Net), various TCP books have appeared. A new one, "TCP/IP Lean" by Jeremy Bentham (ISBN 1-929629-11-7) is the latest entry, and is specifically targeted at putting net-awareness on embedded applications.

The book contains complete source code (on disk as well as in the text) for a TCP/IP stack and web server. Do note that the code is copyrighted and may not be used in your systems. This is understandable, though does defeat our usual need to just find a place to get some code, quickly. Look at this as an educational volume, not a canned solution.

I like the fact that the software is structured as a state machine; it's a nice real world example of using a state machine in a complicated application.

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Also nice is that the author presents code for both a 80188 CPU and a PIC 16C76, so he covers both the middle and low end range of embedded processors.

The book includes good explanations of the various protocols involved. Ever wonder what ARP is all about? Bentham explains these important concepts in detail and quite understandably.

Alan Bensky's new book, "Short-Range Wireless Communication" (ISBN 1-878707-53-1), is a timely introduction to sending data over radio links.

This is not a volume for the fainthearted; it covers RF with plenty of theory and equations. It's good stuff if you need to know how this all works, but count on being challenged by the math if hardware is not your thing.

One shortcoming is the lack of Bluetooth coverage; the single-page description isn't of much use to people dealing with Bluetooth today.

It's important to note that this volume doesn't include code or much in the way of hardware design. It's more a background for hardware engineers. There is a chapter on commercial chips and boards you can buy to do the RF portion of your link, though. I worry that this data could soon become obsolete, but as of now it's quite useful.

Possibly the most useful chapter covers regulations for RF operation in different countries. Fact is, no one dares transmit anything without conforming to the rules. And, I found the appendix on Information Theory quite interesting.

But for RF theory I much prefer "The ARRL Handbook for Radio Amateurs" (http://www.arrl.org/catalog/?category=Reference). I've got the 1970 edition, which covers transistor and vacuum tube designs. Page for page it's the most useful radio book I know.

Where Bentham's book contains code that implements TCP/IP, and Crenshaw's book shows you how to create code to fit your particular algorithm need, Bensky's book is much more detailed background to RF.

Thought for the Week

OK – this one is NOT a joke. In my continuing search for the silliest embedded system I ran across a smart coffee scoop at a Maryland Mall.

A computer controlled spoon? How much intelligence do my utensils need?

About The Embedded Muse

The Embedded Muse is an occasional newsletter sent via email by Jack Ganssle. Send complaints, comments, and contributions to him at jack@ganssle.com.

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