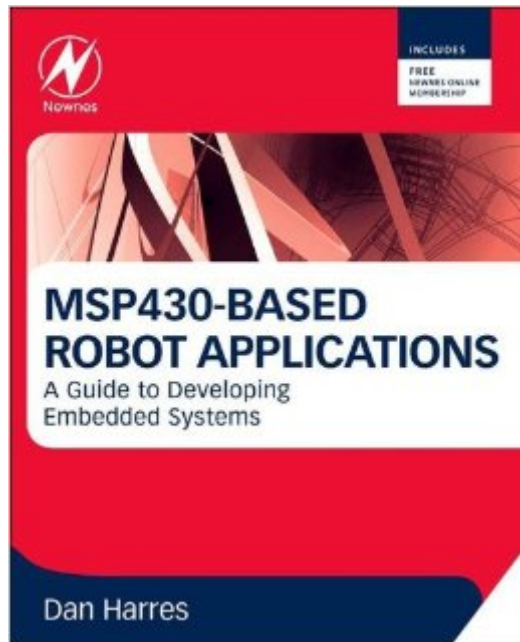# MSP430-based Robot Applications: A Guide To Developing Embedded Systems

Synopsis

This book provides a careful explanation of the basic areas of electronics and computer architecture, along with lots of examples, to demonstrate the interface, sensor design, programming and microcontroller peripheral setup necessary for embedded systems development. With no need for mechanical knowledge of robots, the book starts by demonstrating how to modify a simple radio-controlled car to create a basic robot. The fundamental electronics of the MSP430 are described, along with programming details in both C and assembly language, and full explanations of ports, timing, and data acquisition. Further chapters cover inexpensive ways to perform circuit simulation and prototyping. Key features include: Thorough treatment of the MSP430â ™s architecture and functionality along with detailed application-specific guidance Programming and the use of sensor technology to build an embedded system A learn-by-doing experience With this book you will learn: The basic theory for electronics design Â Â Â Â Â Â Â Â Â Â Â Â Â Â Â - Analog circuits Â Â Â Â Â Â Â Â Â Â Â Â Â Â Â - Digital logic   Â Â Â Â Â Â Â Â Â Â Â Â Â Â Â Â - Computer arithmetic   Â Â Â Â Â Â Â Â Â Â Â Â Â Â Â - Microcontroller programming   How to design and build a working robotAssembly language and C programming How to develop your own high-performance embedded systems application using an on-going robotics application Teaches how to develop your own high-performance embedded systems application using an on-going robotics applicationThorough treatment of the MSP430â ™s architecture and functionality along with detailed application-specific guidanceFocuses on electronics, programming and the use of sensor technology to build an embedded systemCovers assembly language and C programming

Book Information

Lending: Not Enabled

Enhanced Typesetting: Not Enabled

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Customer Reviews

Dan Harres book is well written, and covers all of the key basics that are needed for someone who is new to Microcontrollers (MCUs), and new to robots.It focuses on how to use a low-cost ($ 10), but extremely popular Microcontroller platform, the Texas Instruments MSP430 Launchpad, for use in a low cost robot. But even though it uses a low cost R/C car robot as the robot platform, the robot project includes a number of very useful features, including ultra-sound sensors, and light sensors.It teaches the beginner all of the key basics of how to use a Microcontrollers's functions: systems clocks, digital I/Os, Analog to Digital converters, Timers, and Pulse Width Modulators, and does so in a very straight-forward, and easy to grasp fashion.But the best part, and what separates it from other Microcontroller tutorial type books, is that it does an excellent job of describing the associated Analog portions of the project, including the basics of motor control, pulse width modulation, ultrasonic ping processing, light detection, and so forth. It takes subjects that are often complex and confusing for beginners, and breaks them down, and walks through how to use the associated analog electronics that control the robot in a very readable fashion. It simplifies the math so that even a beginner can grasp what is going on.It also discusses, and walks through some of the issues that can "bite you" when designing robotic/analog circuits, such as noise, and shows how to solve them. So it provides a good view of what "real engineering" tasks consist of. The reader actually understands what is going on, rather than just soldering and slapping a robot together.

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