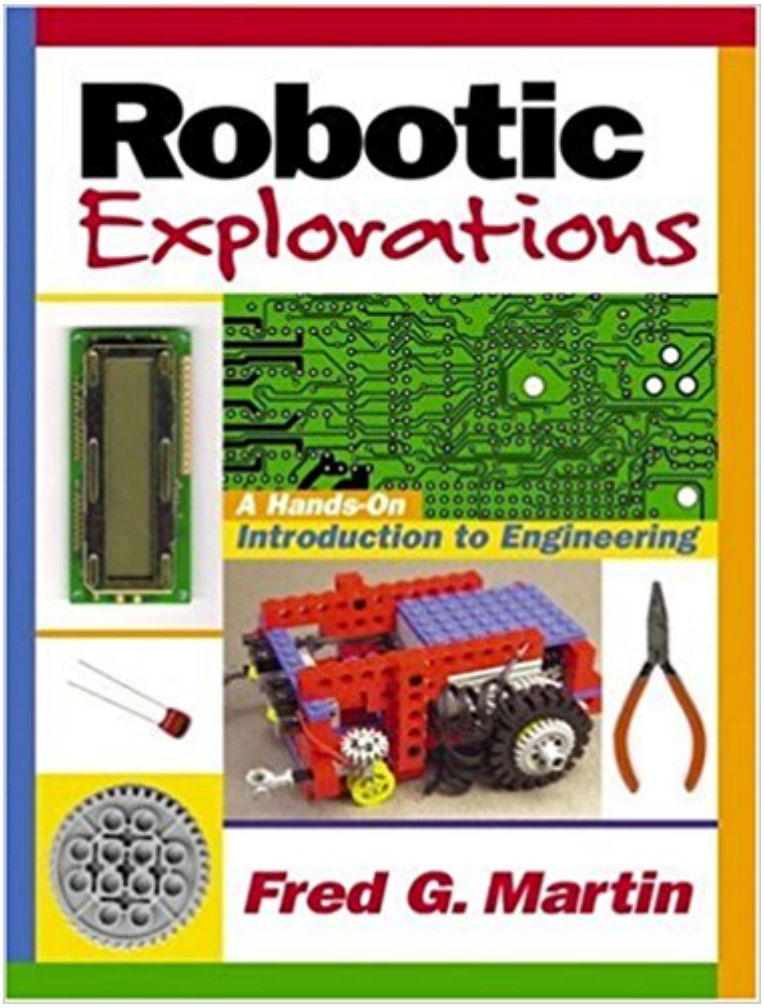
Robotic Explorations: A Hands-On Introduction To Engineering



Synopsis

This hands-on, introductory book is based on widely available, custom robotics materials (Handy Board, Interactive C, LEGO Technic). Covers sensors; motors, gears, and mechanism; control; handy board design; construction techniques; DC Motor; and more. Ideal as an introduction to electrical engineering or capstone design. Also appropriate for readers interested in electrical technology robotics.

Book Information

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Customer Reviews

Written by one of the founders of the famous MIT "6270" Lego Robotic design Competition, Robotic Explorations: A Hands-On Introduction to Engineering engages students in hands-on robot building, emphasizing technological systems of all kinds—electrical, mechanical, and computational. A first text for students as well as reference for practitioners, the book provides all the practical information needed to create an introductory freshman-level laboratory class. This versatile and pioneering book sparks the imagination and leads the reader into many thought-provoking and challenging engineering situations. Robotic Explorations includes: An introduction to the field of engineering design, accessible to students at multiple undergraduate levels, with concepts relevant to electrical, mechanical, and software systems. Principles of mechanical design, illustrated using the catalog of parts available in the LEGO TechnicÂ® system. Step-by-step instructions for building "My First Robot," a tutorial for beginning explorations of control. Applications of various control strategies including traditional proportional/derivative feedback, behavioral robotics, and hierarchical control. Designs and application ideas for robotic sensors. Project guidelines for designing robot

contests to facilitate students' learning of particular engineering concepts. Documentation for using educational robotics technology developed at MIT—Handy Board control hardware and Interactive C software.

I just finished participating in the MIT 6.270 Autonomous Robot Competition. This book really pulls together everything you need to understand how to build a robot from Lego parts, and interface it to the real world using a variety of sensors and actuators (aka motors). There is so much to be learned by actually BUILDING a robot - this is a great book to help you dig into your own project. You can order the same hardware and software used in the MIT class off the internet as well.

This is a great book though I will probably not rank it good. Should be acceptable. It's a really old book.

I love it

I purchased this book as a 'recommended' book for a class almost nine years ago and it's still interesting.

This book presents an introduction to various aspects of robot building and planning. It is written as an undergraduate textbook, and contains numerous exercises throughout the text. The book assumes that students and other readers will have access to Handyboards and LEGO Technic equipment, as well as a desktop PC and hobbyist-level soldering equipment. The book walks the reader through analyzing a Handyboard, how to use it, how to build custom sensors and motors, and how to write programs in assembly language. All of this information would be very useful to first-year engineering students as it would help them put theory from many of their other classes into practice. Nevertheless, most of the tasks and programs described in the book could actually be built with a standard LEGO RCX brick. On the other hand, a person who masters the material in this book would be able to take advantage of the extra sensors and motors that the Handyboard supports and build far more sophisticated robots than would be possible with LEGO Mindstorms equipment. Anyone who builds robots using LEGO equipment, whether with a Handyboard or an RCX, will find information in this book about Braitenberg vehicles, LEGO design, control theory, and robotics contests quite useful. The introduction to Assembly language in Appendix A is also presented in an easily accessible style.

Kind of funny, this book showed up as a suggestion on some random unrelated page, and I had to comment.I took an Intro to Robotics course a number of years ago, the author of this book being the teacher of the course.All I can say at this point is that parts and components may change over time, but the basic lessons of robotics remain the same. And these lessons have helped me even to this day, most notably forcing myself to reject a mindset of "it should just work". (Thanks, Fred!)Humans do so many things so easily that until you try to program a robot yourself, you can't really appreciate whats actually involved.That's sort of the other thing that I got out of the course and this book - the ability to deconstruct whats involved in these "simple things", like accurately walking towards a source of light, and using that information on the job (lasers, motion control, sensors, etc).In a way, this book is good not only for people interested in robotics, but also for people interested in humans and how they work. When trying to figure out how to make a robot do something, you have to first figure out how YOU do it, then adapt that to the available hardware.Plus... You get to play with Lego's, man.

I found this to be an excellent introduction to how to build a fully functional, autonomous robot. This book covers everything you need to build robots using LEGO Technics (think LEGO blocks plus gears, motors, etc.) and a Handyboard, a robot brain developed to get the hard digital electronics out of the way so you can concentrate on putting together a good design with motors and sensors and software intelligence.As someone looking for how to break into robotics without first getting bachelors in Electrical Engineering or Mechanical Engineering, this book was for me. I got the basics of the two topics covered and was able to dive right into the interesting "what can I do with my robot" scenarios.This book also goes into some detail on inexpensive sensor components out in the electronics market and how to use them in robots. I found this to be a great source of ideas and instructions even when not creating robots using the Handyboard brain.For those looking to dabble, be aware that this is a book best used in conjunction with real, live robot parts. (...)

The basic content of this book is excellent. It provides a readily accessible introduction to the principles of engineering. This book could easily be used as the text for a first year course in a unified engineering curriculum including Computer Science. The one flaw with this book is that it appears to have been rushed out by the publisher. Many of the page references are to the wrong pages and some of the pictures are rather blurry. Finally, the instructions for creating and downloading ICB files to incorporate assembly language modules for interrupt side programming

and similar purposes needs to be reworked in a future edition. I hope that a future edition will also have a chapter on electrical design and construction techniques to compliment the chapter on mechanical techniques. I also look forward to a third chapter on sensing and possibly a second chapter on control theory. Regardless, this is overall an excellent book and should be acquired by anyone interested in small robots.