

Embedded Systems & Robots: Projects Using The 8051 Microcontroller

By Subrata Ghoshal

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Embedded Systems & Robots: Projects Using The 8051 Microcontroller is meant to serve as a reference book on real-time embedded system design and the applications of the 8051 microcontroller for undergraduate as well as postgraduate students of computer science, information technology, electronics, instrumentation, mechatronics, and other related disciplines. The book will also prove useful to general readers who wish to understand and fabricate simple working models of robots. This book adopts a do-it-yourself approach, starting with very simple projects and slowly leading to more complex items. It includes discussions on real-time embedded systems and provides step-by-step instructions for design and construction of different types of simple robots. The book highlights the need for accurate scheduling in real-time systems and indicates the related solution-techniques through assembly language programming. It contains discussions on importance of data structures in real-time scheduling (Chapter 7) and interfacing issues of sensors such as SONAR, infrared, LDR, and tactile sensors. The book provides complete fabrication blue-prints of several robot examples, including line-follower robot, maze-solving robot, obstruction-detecting robot, shadow-activated robot, learning robot, and humanoid robot. The book uses simple and lucid language for easy understanding of the concepts involved. A large number of illustrations (in colour where required) have been incorporated to enhance understanding of relevant technical details. All circuits shown in the book have been tested. Review exercises, including objective-type questions have been provided at the end of every chapter to test the students understanding of the topics discussed.

Key Features

- (1) Delineates 11 do-it-yourself projects using the 8051 microcontroller with complete hardware circuit details and software listings
- (2) Follows a step-by-step approach for understanding the design concepts of real-time embedded systems
- (3) Contains over 350 diagrams, photographs, and tables for quick, clear, and easy understanding
- (4) Includes 16 colour plates to enhance display of selected figures and photographs

(5) Incorporates end-of-chapter exercises, including objective-type questions

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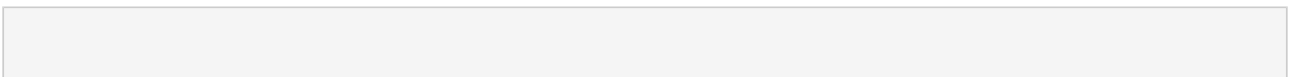
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Editorial Review

About the Author

A Ph D from IIT Bombay, Subrata Ghoshal is currently Professor in the Embedded System Design Department of IIIT, Pune. He has over 20 years of teaching experience at reputed institutes of higher education in India, including BITS (Pilani), STCET (Kolkata), and SMIT (Sikkim). He has authored two books and has to his credit several technical papers published in India and abroad. He has also served as Guest Editor of the Robotics issue of CSI Communications (November, 2008). His research interests include robotics, artificial intelligence, and embedded system design.

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