

C Programming of Microcontrollers for Hobby Robotics

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Abstract. This handout supplies the necessary start up information for programming microcontrollers in C language. The examples of the handout is selected on the amateur robotics applications such as line tracking by a mobile platform, on-off, proportional, proportional-integral-derivative control for servomotor control.

Keywords: PIC microcontroller, C for hobby robotics, line tracking, PID controller.

1 Introduction

This article is written for the novice robotics hobbyists who want to have a quick start in microprocessor programming, for the IIRC 2008 Robotics Competition. It is a great opportunity for a hobbyist to enjoy the competition with a home-made robot.

A *microcontroller* (or MCU) [1] is a computer-on-a-chip used to control electronic devices. It is a type of microprocessor emphasizing self-sufficiency and cost-effectiveness, in contrast to a general-purpose microprocessor used in a PC. A typical microcontroller contains all the memory and interfaces needed for a simple application, whereas a general purpose microprocessor requires additional chips to provide the same functions.

The microcontroller applications are mainly categorized into the following fields in an alphabetic listing: Audio; Automotive; Wired communication; Computers and peripherals; Consumer Appliances; Industrial Instrumentation; Imaging and video application; Medical Instrumentation; Military and aerospace instrumentation; Mobile and wireless devices; Motor control; Security Equipments; General Purpose Devices; and Miscellaneous Applications. From these fields, robotics uses the wired and wireless communication, image processing, and motor control extensively.

A microcontroller is a must of a mechatronics device which combines intelligence, mechanical actions, and sensory devices for a goal. Robotics and Hobby Robotics are typical fields of mechatronics. In a robot, microcontrollers are embedded to implement intelligent control algorithms.

A low-end microcontroller can execute most of the robotics control algorithms. Implementation of robotics microcontroller applications requires two main components, a microcontroller and its IC-programming tool, and a convenient programming language to express the algorithms. The main objective of this article is an introduction to these item.

C Programming Of Microcontrollers For Hobby Robotics

BM King



C Programming Of Microcontrollers For Hobby Robotics:

Embracing the Beat of Phrase: An Psychological Symphony within **C Programming Of Microcontrollers For Hobby Robotics**

In a world consumed by displays and the ceaseless chatter of immediate transmission, the melodic splendor and emotional symphony created by the prepared term frequently diminish in to the background, eclipsed by the persistent noise and interruptions that permeate our lives. Nevertheless, set within the pages of **C Programming Of Microcontrollers For Hobby Robotics** a marvelous fictional prize brimming with raw feelings, lies an immersive symphony waiting to be embraced. Constructed by a masterful composer of language, that captivating masterpiece conducts visitors on an emotional journey, skillfully unraveling the hidden melodies and profound impact resonating within each carefully constructed phrase. Within the depths of this touching analysis, we can explore the book is key harmonies, analyze its enthralling publishing model, and surrender ourselves to the profound resonance that echoes in the depths of readers souls.

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