Microcontroller Based Motor Controller Project Report

Yousef S. Ettomi Ali

A Microcontroller Based Stepper Motor Control System Dereng Mao,1990

Motor Control System Development Using Microcontroller Based in PID Controller ,2014

PIC16F1847 Microcontroller-Based Programmable Logic Controller Murat Uzam,2020-10-23 The PIC16F1847-Based PLC project supports up to 4 analog inputs and 1 analog output, 1 High Speed Counter, 2 PWM (pulse width modulation) outputs, 1 Drum Sequencer Instruction with up to 16 steps, the implementation of Sequential Function Charts (SFCs) with up to 24 steps. This volume presents advanced concepts of the PIC16F1847-Based PLC project and consists of topics like program control, high speed counter and PWM macros. It further explains memory related drum sequencer instruction, sequential functional charts, and analog input and output modules. Aimed at researchers and graduate students in electrical engineering, power electronics, robotics and automation, sensors, this book: Presents program control macros to enable or disable a block of PLC program or to move execution of a program from one place to another. Proposes a High-Speed Counter and four PWM Macros for high speed counting and PWM operations. Develops memory related macros to enable the user to do memory read/write operations. Provides a Drum Sequencer instruction with up to 16 steps and 16 outputs on each step. Discusses the implementation of Sequential Function Chart (SFC) elements with up to 24 steps.

Microcontroller Based DC Motor Control and Measurement Ruthiran Punniavan,2005

Microcontroller Based DC Motors Lakshminarayana Gadupudi,Heena Chandwani,2012 Motion control is required in large number of industrial and domestic applications. Such systems employed for motion control are called drives. Direct current (dc) drives are extensively used in industry all over the world. This project takes the area speed control of dc motor using low cost and easily available 8-bit microcontroller. The speed of dc motor is linearly increasing speed and most popular. The dynamic response of dc drive is better than other drives, it has only varying the armature voltage of the motor and there is no harmonics and frequency loss. The speed and current feed-back paths are available from digital signal and analog signal respectively. The proportional integral controller logic is used to calculate the error signal and generate the control signal.The combination of proportional integral controller is used for dynamic response of the closed-loop control system. The AT89S52 microcontroller is used to implementation of proportional integral logic in the C language of KEIL IDE complier. In-System Programmer is used for loading the program from personal system to 89S52 microcontroller.

Development of a Microcontroller-based Speed Control System for DC Motors Ramkumar Rajan,1991

DC Motor Synchronization Speed Controller Based on Microcontroller Aamir Shahzad,2020 In this chapter, we report the design and fabrication of an improved speed synchronizer device in which two dc motors has been controlled on different sequences programmed by microcontroller. Depending on the programmed software, the device is used to command a rolling of machines, synchronizes the dc motors speed, and displays the result on liquid crystal display (LCD). Flash memory of the microcontroller is used to program for controlling this device where permanent memory is needed to store different parameters (codes for motor speed, LCD display, ratio control, and rotary encoder,Äôs feedback). The present simulation gives new reliable results with better performance for the speed and direction than the earlier available synchronizers. It has been shown that the speed and direction are dependent on both the ratio setting and frequency of encoder in two dc motors speed synchronizer. It is shown that this device is applicable for controlling, monitoring, and synchronizing identical processes and can be implemented in multiple domains, from textile industry and home control applications to industrial instruments.

Direct Current Motor Control Led by Microcontroller Created PWM Thinesh Kunasegeran,2012 Direct current (DC) motor has already become an important drive configuration for many applications across a wide range of powers and speeds. The ease of control and excellent performance of the DC motors will ensure that it is widely used in many applications. This project is mainly concerned on DC motor speed control system by using microcontroller PIC 16F877A. Pulse Width Modulation (PWM) technique is used where its signal is generated in microcontroller. The program for PWM generation is written in C+ Language using MPLAB IDE software. It is programmed into the microcontroller using PIC Microcontroller Start-up Kit. Then the microcontroller is installed into the motor control circuit. The Microcontroller acts as the motor speed controller in this project. The PWM signal will send to motor driver to vary the voltage supply to motor to acquire desired speed. Besides, it also shows a graph of motor speed versus PWM dutycycle percentage to let the user monitor the performance of the system easily. Based on the result, the readings are quite reliable. Through the project, it can be concluded that microcontroller PIC 16F877A can control motor speed at desired speed efficiently by using Pulse Width Modulation signal.

QNX Based Stepper Motor Controller Sampson Wong,2001

Speed Control & Vector Control Design Implementation for Electric Vehicle Project Rami Mourtada,Jaideep Tandon,1995

Microcontroller-based PID Controller for DC Motors Henry V. Tabangay,2008

Development of a Microcontroller-based Variable Speed Induction Motor Drive Controller N. M. Tsang,1988

Classical and Modern Controls with Microcontrollers Ying Bai,Zvi S. Roth,2018-12-13 This book focuses on the design, implementation and applications of embedded systems and advanced industrial controls with microcontrollers. It combines

classical and modern control theories as well as practical control programming codes to help readers learn control techniques easily and effectively. The book covers both linear and nonlinear control techniques to help readers understand modern control strategies. The author provides a detailed description of the practical considerations and applications in linear and nonlinear control systems. They concentrate on the ARM® Cortex®-M4 MCU system built by Texas InstrumentsTM called TM4C123GXL, in which two ARM® Cortex®-M4 MCUs, TM4C123GH6PM, are utilized. In order to help the reader develop and build application control software for a specified microcontroller unit. Readers can quickly develop and build their applications by using sample project codes provided in the book to access specified peripherals. The book enables readers to transfer from one interfacing protocol to another, even if they only have basic and fundamental understanding and basic knowledge of one interfacing function. Classical and Modern Controls with Microcontrollers is a powerful source of information for control and systems engineers looking to expand their programming knowledge of C, and of applications of embedded systems with microcontrollers. The book is a textbook for college students majored in CE, EE and ISE to learn and study classical and modern control technologies. The book can also be adopted as a reference book for professional programmers working in modern control fields or related to intelligent controls and embedded computing and applications. Advances in Industrial Control reports and encourages the transfer of technology in control engineering. The rapid development of control technology has an impact on all areas of the control discipline. The series offers an opportunity for researchers to present an extended exposition of new work in all aspects of industrial control.

Microcontroller-based Fuzzy Logic Speed Controller for Three-phase Induction Motor Marwan A. A. Badran,2013 Three-phase induction motors have been used in a wide range of industry applications; since they are robust, brushless and have simple design. Furthermore, the speed of induction motor can be easily controlled by variable frequency drives. The continuous development in power electronics semiconductors came out with modern electric drives. These drives use high speed power transistors, like IGBT and MOSFET, with various switching techniques. The speed control of induction motor is important to achieve maximum torque and efficiency. In the past decades, conventional control systems, such as proportional-integral derivative (PID) controller, were applied to electric drives to control the speed of induction motor. The PID controller is not a well established control method in motor drive because of the nonlinearity of induction motor. On the other hand, the use of Fuzzy Logic Controller (FLC) improves the performance of the speed control of induction motor. In this research, a microcontroller-based fuzzy logic controller was developed. The FLC replaces the conventional PI controller to improve the speed response of the drive in order to keep the speed of the induction motor constant when the load varies within the operating range. The research also included the design and implementation of a three-phase voltage source inverter (VSI) driven by Space Vector Pulse Width Modulation (SVPWM) signal. The control system in this research was designed using Matlab/Simulink environment. The simulation included a comparison of speed response of FLC and PI

controller. The input to FLC is the linguistic variable of speed error and change of speed error, while the output of FLC is the frequency fed to the inverter. The three-phase inverter was fabricated using MOSFET Hex-bridge connected to a low-pass LC-filter to smooth the inverter output voltage wave. In order to apply FLC and generate corresponding SVPWM signals a PIC16F877A microcontroller was used in the control system. The speed controller was tested using various values of input speed using simulation and experiments. The results showed the superiority of the proposed FLC over the conventional PI controller in the dynamics response of speed. The results also showed the ability of the proposed to generate a three-phase sine wave with desired frequency to control the speed of the induction motor with THD less than 5%.

DC Motor Control - A case study MOHAMMED ASLAM HUSAIN,2018-11-20 In this book the four quadrant speed control system for DC motor has been studied and constructed. To achieve speed control, an electronic technique called pulse width modulation is used which generates high and low pulses. These pulses vary in the speed of the engine. For the generation of these pulses, a microcontroller is used. It is a periodic change in the program. Different speed grades and the direction are depended on different buttons. The experiment has proved that this system is higher performance. Speed control of a machine is the most vital and important part of any industrial organization. This paper is designed to develop a four-quad speed control system for a DC motor using microcontroller. The engine is operated in four quadrants ie clockwise, counterclockwise, forward brake and reverse brake. It also has a feature of speed control. The four-quadrant operation of the dc engine is best suited for industries where engines are used and as a requirement they can rotate in clockwise, counter-clockwise and thus apply brakes immediately in both the directions. In the case of a specific operation in an industrial environment, the engine needs to be stopped immediately. In this scenario, this system is very integral. The PWM pulses generated by the microcontroller are instantaneous in both directions and as a result of applying the PWM pulses. The microcontroller used in this project is from 8051 family. Push buttons are provided for the operation of the motor which are interfaced to the microcontroller that provides an input signal to it and controls the speed of the engine through a motor driver IC. The speed and direction of DC motor has been observed on digital CRO

Microcontroller Based Adjustable Speed Closed-loop Dc Motor Drive Yousef S. Ettomi Ali,2004 The speed control of DC motors is crucial especially in applications where precisions and protection are of importance. This work investigates and implements a microcontroller-based adjustable speed drive system for a system shunt motor. The theory of the armature voltage control algorithms in a closed loop system has been successfully implemented. An IGBT switch is used in buck configuration to control armature voltage of the motor. The PWM signal that controls the IGBT is generated from a motorola 68 HC11 microcontroller. The speed of the motor is measured by a shaft encoder and directly fed to the microcontroller along with a speed reference signal. A data acquisition routine reads the measured speed and the reference speed in digital format and generates the error value signal. The error values signal is directly fed into the proportional controller routine to

commute the controller output. Finally, the controller output is used to generate a PWM, which completes the loop by controlling the switch. To protect the motor from gih current, a current monitoring routine is implemented to read the motor current through a Hall effect sensor. If the motor current is higher than its rated curent halting the PWM generation routine will stop. Experimental results obtained have supported the idea of the design. The speed of the motor could be controlled over a wide range using the dc chopper and the PWM. Employment of a microcontroller has shown a great improvement in the acceleration, speed reduction, and deceleration and over current protection of a dc motor.

Microcontroller-based System Controller for a Hybrid Electric Vehicle John Hsu,2002

Design of DC Motor Speed Controller Using Microcontroller ,2011

An Intel 80C196KB Microcontroller Based Implementation of the MVVS Algorithm for the Cornell Electric Vehicle William Dill,1993

A DC Motor Controller Using PID Algorithm Implementation on PIC Wan Robaah W Ahmad,2008 This project is about controlling the speed of DC servo motor by using Proportional-Integral-Derivative (PID) algorithm then implemented on Peripheral Interface Circuit (PIC) microcontroller. The main objective of this project is to control the speed of DC servo motor at the demanded speed or to drive the motor at that speed. The speed of a DC motor usually is directly proportional to the supply voltage. So, if we reduce the supply voltage from 12 Volts to 6 Volts, the motor will run at half the speed. It could be achieved by simply adjusting the voltage sent to the motor, but this is quite inefficient to do. So, A PID controller becomes the best way to overcome this problem. PID attempts to correct the error between a measured process variable and a desired setpoint by calculating and then outputting a corrective action that can adjust the process accordingly. In this project, the PID algorithm that is added to the system becomes a closed loop system. A simulation using MATLAB software is implemented to tune PID algorithm by changing the value of Proportional gain, Kp, Integral gain, Ki and Derivative gain, Kd to get a speed of the motor which is less overshoot and increase settling time. Then, a PIC microcontroller is programmed by adding the value of tuned PID algorithm to control the speed of DC servo motor. At the end of the project, the speed of the DC servo motor should be maintain even the supply voltage is varied.

Unveiling the Energy of Verbal Artistry: An Emotional Sojourn through **Microcontroller Based Motor Controller Project Report**

In a global inundated with screens and the cacophony of quick communication, the profound energy and emotional resonance of verbal beauty usually diminish in to obscurity, eclipsed by the regular assault of noise and distractions. Yet, set within the

musical pages of **Microcontroller Based Motor Controller Project Report**, a charming function of fictional elegance that pulses with organic feelings, lies an remarkable journey waiting to be embarked upon. Written with a virtuoso wordsmith, that exciting opus courses visitors on a psychological odyssey, softly exposing the latent possible and profound influence embedded within the delicate internet of language. Within the heart-wrenching expanse of this evocative examination, we will embark upon an introspective exploration of the book is central styles, dissect their captivating publishing type, and immerse ourselves in the indelible impact it leaves upon the depths of readers souls.

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