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TEMPERATURE CONTROL USING FUZZY LOGIC

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ABSTRACT

The aim of the temperature control is to heat the system up todelimitated temperature, after ward hold it at that temperature in insured manner. Fuzzy Logic Controller (FLC) is best way in which this type of precision control can be accomplished by controller. During past twenty yearssignificant amount of research using fuzzy logichas done in this field of control of non-linear dynamical system. Here we have developed temperature control system using fuzzy logic. Control theory techniques are the root from which convention controllers are deducted. The desired response of the output can be guaranteed by the feedback controller.

KEYWORDS

Fuzzy logic, Fuzzy Logic Controller (FLC) and temperature control system

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Speed Control of Separately Excited DC Motor using Fuzzy Neural Model Reference Controller

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ABSTRACT

In this paper an analytic approach is devised to represent, and study the behavior of, nonlinear dynamic chaotic Genesio system using general nonlinear modal representation. In this approach, the original nonlinear ordinary differential equations (ODEs) of model transforms to a sequence of linear timeinvariant ODEs. By solving the proposed linear ODEs sequence, the exact solution of the original nonlinear problem is determined in terms of uniformly convergent series. Also an efficient algorithm with low computational complexity and high accuracy is presented to find the approximate solution. Simulation results indicate the effectiveness of the proposed method.

KEYWORDS

Chaotic Systems, Genesio System, Modal Series, Ordinary Differential Equations

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FAULT DETECTION AND ISOLATION USING UNKNOWN INPUT OBSERVERS WITH STRUCTURED RESIDUAL GENERATION

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ABSTRACT

Detection and isolation of faults are important tasks for improving the reliability of process industries in order to enhance their products quality. This paper investigates the detection and isolation of faults using structured residuals. Actuator and sensor faults are considered. Residuals are generated using a bank of unknown input observers (UIO). Three-tank benchmark system was used as a prototype of many process industries. Simulation results show the effectiveness of the studied method.

KEYWORDS

Fault detection and isolation, Three-tank benchmark, Residual generation, Residual evaluation, Unknown input observer

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VIBRATION AND TIP DEFLECTION CONTROL OF A SINGLE-LINK FLEXIBLE MANIPULATOR

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ABSTRACT

In this paper, a hybrid control scheme for vibration and tip deflection control of a single link flexible manipulator system is presented. The purpose of this control is for input tracking, vibration control of hub angle and tip deflection control. The control scheme consists of a resonant controller and a fuzzy logic controller (FLC).The resonant controller is used as the inner loop feedback controller for vibration control using the resonant frequencies at different resonant modes of the system which were determined from experiment. The fuzzy logic controller is designed as the outer loop feedback controller for the tracking control and to achieve zero steady state error. The performance of the proposed control scheme is investigated via simulations and the results show the effectiveness of the control scheme, in addition the controller is tested to show it robustness using different values of payload.

KEYWORDS

Hybrid controller, vibration control, resonant controller, fuzzy control, flexible link manipulator.

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REAL TIME DATA ACQUISATION OF SOLAR PANEL USING ARDUINO AND FURTHER RECORDING VOLTAGE OF THE SOLAR PANEL

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ABSTRACT

This paper presents the simulation of real time data acquisition of a solar panelin LabVIEW. A prototype model has been made where two Arduino were used. One is used for interfacing the solar panel with the PC for acquisition of data and the other one isused with the servomotor. The servomotor is linked with the solar panel with the help of a shaft and is rotated according to the LDR output. Two LDR is fixed on both the sides of the solar panel for tracing the sunlight. The whole simulation is performed with the help of LINX firmware wizard, which is available in LabVIEW Maker's Hub. Data were collected of different days in different duration of time. According to the collected data, behaviour and the voltage of the solar module was analysed. This paper describes the design of a low cost, solar tracking and real time data acquisition system.

KEYWORDS

Arduino (microcontroller), Servomotor, LabVIEW Makers Hub, LINX firmware wizard.

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IMPORTANCE OF THREE-ELEMENTS BOILER DRUM LEVEL CONTROL AND ITS INSTALLATION IN POWER PLANT

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ABSTRACT

Conversion of water into steam is the primary function of a utility boiler. The steam pressure is used to turn a steam turbine thus, generating electricity. Within the boiler drum there exists a steam/water interface. Boiler steam drum water level is one of the important parameters of power plant that must be measured and controlled. For safe and efficient boiler operation, a constant level of water in the boiler drum is required to be maintained. Too low water level may cause damage boiler tube by overheating. On the other hand too high drum water level leads to improper function of separators, difficulty in temperature controlling and damage in superheater tubes. Turbine may also be damaged by moisture or water treatment chemicals carryover. The amount of water entering the boiler drum must be balanced with the amounts of steam leaving to accomplish the constant water level in the drum. Therefore it is extremely important to have the knowledge of the operating principles, installation requirements, strength and weaknesses of drum water level control system. Ignoring these considerations can result in misapplication, frequent maintenance, unsafe operation and poor instrument as well as system performance. In this paper design aspects and installation requirements of boiler drum level control are discussed for safe and economic operation.

KEYWORDS

Superheater, Steam Drum Level, Wet Leg System, Swell, Cascade Controller

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MULTIPLE LINEAR REGRESSION ANALYSIS FOR PREDICTION OF BOILER LOSSES AND BOILER EFFICIENCY

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ABSTRACT

Calculation of boiler efficiency is essential if its parameters need to be controlled for either maintaining or enhancing its efficiency. But determination of boiler efficiency using conventional method is time consuming and very expensive. Hence, it is not recommended to find boiler efficiency frequently. The work presented in this paper deals with establishing the statistical model for boiler efficiency using major boiler losses. Collected data from an eminent industry shows that the loss due to dry flue gas, loss due to hydrogen content in fuel and loss due to moisture content in fuel are the major losses. The boiler efficiency depends mainly on these losses. Multiple regression analysis is used for building the model.

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ROBUST STABILIZATION OF A QUADROTOR UAV IN PRESENCE OF ACTUATOR AND SENSOR FAULTS

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ABSTRACT

This paper deals with the stabilization problem of an underactuated quadrotor UAV system in presence of actuator and sensor faults. The dynamical model of quadrotor while taking into account various physical phenomena, which can influence the dynamics of a flying structure is presented. Subsequently, a new control strategy based on backstepping approach, taking into account the actuator and sensor faults is developed. Lyapunov based stability analysis shows that the proposed control strategy design keeps the stability of the closed loop dynamics of quadrotor UAV even after the presence of these faults. Simulations of the controlled system, illustrate that the proposed control strategy is able to maintain performance levels and to preserve stability under the occurrence of actuator and sensor faults.

KEYWORDS

Actuator faults, Backstepping control, Dynamic model of quadrotor, Fault tolerant control (FTC), Robust control, Sliding mode control, Sensor faults,Unmanned aerial vehicles (UAV).

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FUZZY BASED STATOR FLUX OPTIMIZER DESIGN FOR DIRECT TORQUE CONTROL

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ABSTRACT

Direct Torque Control (DTC) is well known as an effective control technique for high performance drives in a wide variety of industrial applications and conventional DTC technique uses two constant reference value: torque and stator flux. In this paper, a new fuzzy based stator flux optimizer has been proposed for DTC controlled induction motor drivers and simulation studies have been carried out with Matlab/Simulink to compare the proposed system behaviours at vary load conditions. The most important feature of the proposed fuzzy logic based stator flux optimizer that it self-regulates the stator flux reference value using the motor load situation without need of any motor parameters. Simulation results show that the performance of the proposed DTC technique has been improved and especially at low-load conditions torque ripples are greatly reduced with respect to the conventional DTC.

KEYWORDS

Induction motor control, Direct torque control, Fuzzy logic optimization, Vector control

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ZIGBEE BASED WIRELESS DATA ACQUISITION USING LABVIEW FOR IMPLEMENTING SMART DRIVING SKILL EVALUATION SYSTEM

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ABSTRACT

The Smart Driving Skill Evaluation (SDSE) System presented in this paper expedite the testing of candidates aspiring for a driving license in a more efficient and transparent manner, as compared to the present manual testing procedure existing in most parts of Asia and Pacific region. The manual test procedure is also subjected to multiple limitations like time consuming, costly and heavily controlled by the experience of examiner in conducting the test. This technological solution is developed by customizing 8051 controller based embedded system and LabVIEW based virtual instrument. The controller module senses the motion of the test vehicle on the test track referred to as zero rpm measurement and the LabVIEW based virtual instrument provides a Graphical User Interface for remote end monitoring of the sensors embedded on the test track. The proposed technological solution for the automation of existing manual test process enables the elimination of human intervention and improves the driving test accuracy while going paperless with Driving Skill Evaluation System. As a contribution to the society this technological solution can reduce the number of road accidents because most accidents results from lack of planning, anticipation and control which are highly dependent on driving skill.

KEYWORDS

LabVIEW, Microcontroller, ZigBee, Data Acquisition , Sensors, E-application, GUI & Driving Skill.

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