Research of Wind-solar Complementary Distribution Based on Power Generation Systems

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Abstract

With the production of the wind-solar complementary system is more and more high degree of automation, the demand related to power general equipment is large. The topic "Wind-solar Complementary platen testing calibration DCS equipment", it can detect the horizontal degree of driven earth, wind power sensor is used to inspect platen assembly quality of riveting point. This article design based on image processing technology of Wind-solar complementary platen online quality detection system, using two cameras, detecting Wind-solar complementary platen riveting quality and horizontal error. Detailed system program design, overall structure, and the experimental results is given. The system hardware is simple, it can realize online real-time transmit.

Keywords

Wind-solar Complementary; Detection correction system; DCS processing technology

1. Introduction

Wind-solar Complementary is composed of the pressure light panels power generation and wind rotation power generation equipment assembly, the high-speed rotating strength is important index to evaluate the quality of the car key parts. In order to guarantee the quality of the driven plate, detection of corresponding technical parameters is necessary. However, at present, there is no automatic equipment which can detect and correct the driven plate level swing error in domestic and foreign market. Artificial detection and correction exists many problems, such as: large error, time consuming. This research is significant to improve the automation of production of the Wind-solar Complementary and the product percent of pass.

2. Computer image technology is used to capture the light angle

Computer vision technology for industrial production of product quality inspection in developing rapidly in recent years, especially in the case of defect detection. Machine vision in theory about the shape feature extraction, Fourier descriptor is an effective means of shape feature description. Also, this method is not affected by driven angle translation or rotation, and so on.

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Project name: wind-light complementary device is suitable for low temperature environment.
3. The overall structure and hardware based on curve of system

Driven plate photoelectric monitoring system is composed of the workbench, the rotation control equipment, cameras and system control part. Under the precise control of computer, coordinated operation, it realizes the wheel rotation, camera work, image recognition processing, alarm parts work. The structure of the measuring device as shown in Picture 1.

![Wind-solar Complementary Distribution curve graph](image1)

Figure 1. Wind-solar Complementary Distribution curve graph

4. System hardware design

Image acquisition system hardware design: The core parts of the system are the two camera image acquisition system and image processing algorithm. Image acquisition part is composed of the cameras and lenses, it is an important part of the detection system, and it is equivalent to the human eye in the machine vision.

The module introduces the selection and application of camera, image acquisition working mode and classification, the design of the imaging system and the design of DSP system structure diagram.

Hardware design of the system: This part mainly solve the problem of selection of ADC chip and single chip microcomputer system, the discussion of keyboard and display, the selection of step motor and driver issues, the choice of testing control and protecting circuit, alarm circuit and test, the design of the amplifying circuit.

Driver: The main task of the stepper motor control program is the judge of direction of rotation. Interrupt output control pulse program listed in appendix.

Accordance: From the point of view of application, it has the following advantages: high integration, fast; Good processing ability strong, rechargeable, addressing a wide range.

ADC0809 conversion chip with 51 single-chip connection as shown on Figure 2.
5. Sunlight servo turntable plate shape feature extraction

This article uses the multimedia timer to achieve timing. It sets image size and time interval by collecting program. In this paper, the size of the image acquisition is set to 350 x 350. Based on the gray image, selected threshold, the binary image, the background and different division. By means of histogram equalization processing, to enhance the image contrast, improve the quality of the image. Performs threshold processing, converting gray image into binary image. After that, eliminate the irregular isolated points in the picture, improve the calculation accuracy. After edge detection and image segmentation, it can get the target shape. Calculating the area of the rivet in the image, judging whether there is leakage phenomenon of riveting. Parallel test, it is in the side of the console, placed a CCD camera, with 25 frames/s to acquire a driven plate profile image sequence. This paper use a binary image as an effective method of straight line detection to realize global detection. Image edge test results as shown in Figure3.

![Figure3. Throughout the landscape distribution graph](image)

6. Program design and experimental results

Visual c ++ for visualization integrated programming environment. Program design, according to six modules including pretreatment image grayed , gray-linear-transformation and median filtering .Image divided includes morphological operation and boundary tracking, etc. The measuring range of Wind-solar Complementary: 230 mm diameter Temperature error: room temperature -30 to 35 °C +/ - 2 °C The torque error: plus or minus 1% (F.S) Nm Speed error: plus or minus 1% (F.S) r/min Error rate: ≦ 2%

7. The conclusion and prospect

It uses advanced testing calibration technology to improve the detection accuracy, reduce the test time , which has become a main trend in the development of domestic automobile detection. In this scheme, the accuracy of each point determined is not high, therefore, the algorithm of each point positioning should be improved.

In hardware part, we use inverter components to catch sun degree, and use data wind power generation processing equipment to complete the recognition process. Direction of future work is to further improve the detection quality of the equipment, in order to achieve faster and more accurate, easier
operation requirements. At the same time, the products adopt industrial development, in order to meet the needs of the domestic market about the kind of special power general equipment.

**Reference**


