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The Notation Scanner Systems using Resilient Backpropagation Method

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Abstract

This research proposes anotation scanner system for numerical notation. This research was supported by using resilient backpropagation algorithm and uses the music application to get a melody of musical instruments. Objects used are designed to be focused on the numerical notation symbols. To be implemented, the input image from camera will be pre-processing, image segmentation, number and symbol recognition, output sound, and to read numerical notation symbols before entering resilient backpropagation algorithm resize the image will be 21x21 pixels. By using colour filtering can reduce errors in handwriting recognition. Success rate by using 15 new sample data with 100 sample data training, the test to get a successful outcome as much as 87.9% and 12.1% error while success rate by using 15 new sample data with 50 sample data training, the test to get a successful outcome as much as 74.4% and 25.6% error.

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Keywords: resilient backpropagation, OpenCV, pattern recognition

1. Introduction

The development of information technology in specific area of computational intelligence has been developed very rapidly such as computer vision and robotics. As in today's society has been living in the globalization era, an era in which the views, products, ideas, and other cultural aspects of each part of the world are able to integrate with each other increasingly influenced by modern technology. Vision-based computer technology has become a part of everyone's life. The latest technology in the field of computer vision has profound implications for companies and individuals, one of them in the music industry.

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Only 8 students or 20% are able to read and write numerical notation of the number of students as many as 40 people. Students is still difficulty in reading numerical notation especially at the level of understanding of the form and note values, the sound tone used in the numerical notation like the sound of the tone of do-re-mi-fa-sol-la-si, how to read the knock-bar notes 1/4 , 1/2, 1/8, and others. Based on these issues, students still do not understand and do not fully understand what the teacher to convey to learning material the art of music.

Many research focusing on reading numbers or symbol based on computer vision, such as reading the Indian numbers through pre-processing operations such as segmentation, binarization, normalization, and location[2]. In previous research[3], English alphabet as a binary value that used as input for simple feature extraction system, whose output is fed to the neural system. Hence it developed an application that can recognize the numerical notation. Objectives of the development of this application is to develop an application that can recognize the shape of the numerical notation using neural network technique with resilient backpropagation algorithm and can secrete melody of music, the development of these applications can help people who want to enjoy a musical of sheet music numerical notation and can learn music by using sheet music numerical notation.

The benefits to be gained by using a neural network technique with resilient backpropagation algorithm in the form of an application can recognize and use music applications that can secrete musical melody, and help users to listen music without having to master the melody sheet music numerical notation, thereby increasing the public's attention will taste curious about the music, and the user can explore the hobby of listening to musical instruments.

2. Proposed Method

We propose our system based on the flow diagram shown in figure 1:

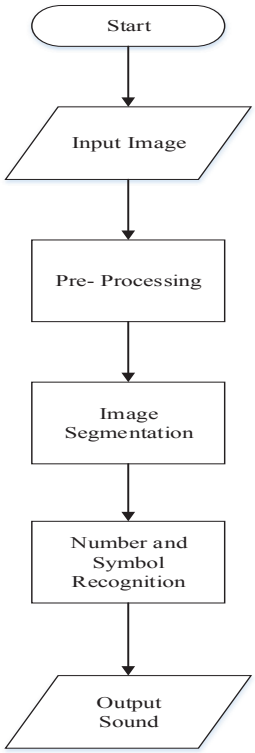

Figure 1. Application flow diagram

At the initial stage, user will input an image in the white paper (HVS) which contains note number along with its symbols. This image input process, done by the user confronts the white paper (HVS) on the next camera.At the pre-processing stage, after the user to input image, display or image by capture the camera will be processed through some kind of process in image processing, will experience the stages of grayscale, brightness, contrast, threshold and canny image.Image segmentation is the stage where the text