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by Nurdin,dahla A ,oc Putri,e Satria,dian R,febri L Yuliwati,asri W, Sujinah,madinah,evan R,alvian R

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Nurdin[1*], Dahlan Abdullah[1], One Charita Putri[1], Erwinsyah Satria[2], Dian Rianita[3], Febri Liantoni[4], Yuliwati[5], Asri Wijayanti[6], Sujinah[7], Madinah[8], Evan Rosiska[9], Alfian Erwinsyah[10], Hendra Syahputra[11] and I Ketut Sudarsana[12]

[1]Department of Informatics, Universitas Malikussaleh, Aceh Utara, Indonesia
[2]Department of Elementary School Teacher Education, FKIP, Universitas Bung Hatta, Indonesia
[3]Department of Administration, University of Lancang Kuning, Pekanbaru, Indonesia
[4]Department of Informatic, Faculty of Information Technology, Institut Teknologi Adhi Tama Surabaya, Indonesia
[5]Department of English Education, STKIP Kusuma Negara, Jakarta, Indonesia
[6]Faculty of Law, Universitas Muhammadiyah of Surabaya, Indonesia
[7]Faculty of Education, Universitas Muhammadiyah of Surabaya, Indonesia
[8]Faculty of Industrial Engineering, National Technology of Science Institut, Jakarta, Indonesia
[9]Department of Information System, University of Putera Batam, Batam, Indonesia
[10]Faculty of Education and Teacher Training, IAIN Sultan Amai Gorontalo, Indonesia
[11]Department of Management, Faculty of Dakwah and Communication, UIN Ar-Raniry, Banda Aceh, Indonesia
[12]Department of Religious Education, Institut Hindu Dharma Negeri Denpasar, Indonesia

* nurdin@unimal.ac.id

Abstract. Sound is a natural and efficient communication media to get an information. In everyday discoveries, someone is always looking for information with other people. Voice with information and data that someone wants to get through various media. Not only by talking we can get information, one of them is through by music. Not only as entertainment, music also have many benefits. At this time maybe not many people know what Indonesian traditional music is, especially Aceh music. Because in this modern era there are so many people who are starting to leave traditional Indonesian music, there are some people who do not know it, even do not want to know it at all for many reasons. One way it can be used to provide information about computer vision used in this study. This research was built using Borland Delphi 7.0 programming language. The sound recognition process is done by inputting the sound sample results and also the sound inputted will produce energy using the Hubbard Stratonovich Transformation method. The results showed that the system depends on the accuracy of the sound technique used, and also obtained an average of an average of around 60% to 90%. Using this system is expected to help release the types of music from Aceh.

1. Introduction

Human voice is one of the most effective means of communication. Besides being effective, humans are also more familiar with using voice in communication [1]. Many ways to develop with humans and electronic devices can be used using sound. But to realize this way there are still many problems and limitations, because the sound cannot be easily recognized by a computer.

Sound is a natural and efficient communication medium to get information. In everyday discoveries, one must get information with other people [2]. Voice with information and data that someone wants to get through various media.

Technological developments that are increasingly prevalent at this time, encourage, and allow one to use computers using voice or speech that creates good communication and information exchange [3]. Who does not know music. both from young people to old people. Not only as entertainment, music and also many benefits. Even music is also very necessary for health therapy. Such as helping patients to improve or maintain their health. Music has long helped people overcome them.

At this time there may not be many people who know Indonesian traditional music, especially Aceh music. Because in this increasingly modern era there are so many people who are starting to leave traditional Indonesian music, there are some people who do not know it, even do not want to know it at all for many reasons.

2. Related Works

Hubbard-Stratonovich Transformation is a precise mathematical transformation discovered by Russian physicist Ruslan L. Stratonovich and popularized by British physicist John Hubbard. It is used to convert particle theory in each field theory by linearizing the density operator in the Hamiltonian interaction term and introducing additional scalar fields. This is defined by an inseparable identity [4]. The basic idea of the HS transformation is to formulate the particle system through the potential of two bodies into an independent particle system interacting with a fluctuating field. This procedure is widely used in polymer physics, classical particle physics, spin glass theory, and electronic structure theory. Where the provisions of hubbard transformation essentially transform this can manipulate or influence integral gaussian and Grassmann variables [5].

3. Research Methodology

3.1 Data Collection Techniques

In collecting data for this study, voice data collection techniques for Aceh ethnic music were used. and each type of music format is changed to WAV and the record process uses Adobe Audition version 1.5. The reason for choosing audioWAV files is because the WAV audio format is the default standard in processing audio on Windows operating systems [6]

3.2 System Requirements Analysis

Hardware or specifications that can be used in this research are as follows:
1. SAMSUNG Laptop
2. Intel Core i3
3. RAM 2 GB
4. HDD 500GB
5. CPU @ 1.70 GHz

Software or general specifications that can be used in this study are as follows:
1. Windows 8
2. Delphi 7.0
3. Microsoft Office 2013
4. Audio Lab VCL
5. Adobe Audition 1.5

3.3 System Design

At this stage the author designs an application or program. The author designs Aceh ethnic music detection program, to help users detect the types of Aceh ethnic music based on its division, like Aceh Besar, Aceh Tamiang, and Aceh Gayo ethnic music using the Delphi 7 programming language [7] and Hubbard Stratonovich-Transformation method.

4. Result and Discussion

4.1 System Analysis

The system designed in this study is an Aceh ethnic music detection system which can detect the type of Aceh music through the sound of songs that can be trained in the system. Aceh ethnic music samples are taken from various sources or intermediary media such as interviews. The results discussed include the selection of training samples for each ethnic music of Aceh Besar, Aceh Gayo, and Aceh Tamiang by taking a sample of 10 ethnic Acehnese music. Where the sample is stored in * .wav audio format.

The system training process is calculating the original signal value, then the HST process to get the energy from the sound signal. And the energy resulting from the transformation is used for the recognition of the voice signal. The system testing, the steps of the system testing process is the same as the training process, which includes the process of calculating the original signal value, then the process of using the HST to get the energy from the sound signal. Furthermore, the signal energy in the testing process will be compared to the signal energy in the previous training process. The approach or similarity in energy values is the reference for the introduction of ethnic Acehnese music, in this case it can be called a statistical approach. The measurement of system performance is an entire process that has been carried out, which contains data from the results of the study.

4.2 Sound Training Sample

The sample used for the introduction of the ethnic types of Aceh Besar, Aceh Gayo, and Aceh Tamiang is a flare file with * .wav extension. the sound file inputted has a 16 bit file size. The file duration is not more than 15 seconds. Figure 1 shows some samples of Aceh ethnic music frequency using Adobe Audition.
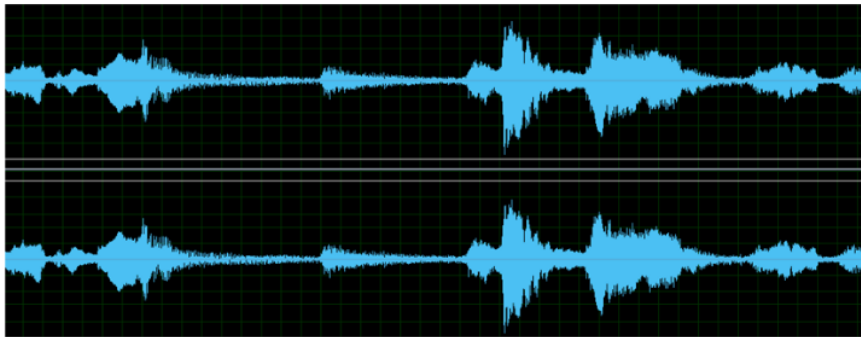

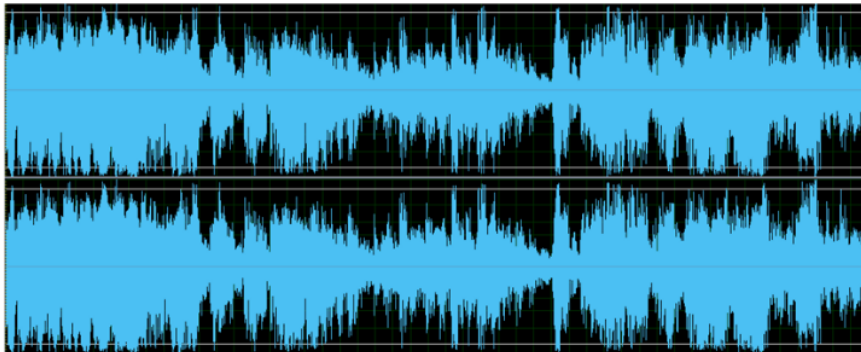**Figure 1**. Sample of Aceh Besar Ethnic Music Sound "Bungong Seulanga"

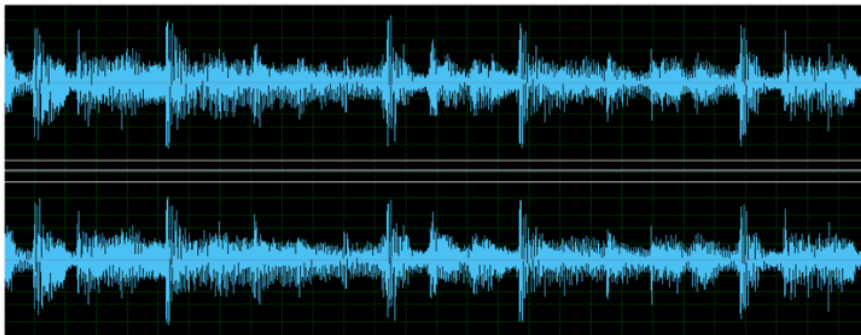**Figure 2**. Sample of Aceh Gayo Ethnic Music Sound "Gayo Blang"

Figure 3. Sample of Aceh Tamiang Ethnic Music Sound "Kuntum Mende"

4.3 *Results of Voice Recognition*

Tests are carried out to compare the sound energy used as a reference with the sound energy that is inputted later, whether the energy can be recognized as a feature or not. The following shows the results of testing the detection system of ethnic Aceh music types.

In Figure 4 can be seen the results of the test of the Aceh Besar music, namely "Bungong Seulanga" was shown through a sample sound signal on the detection system of ethnic Aceh music types.
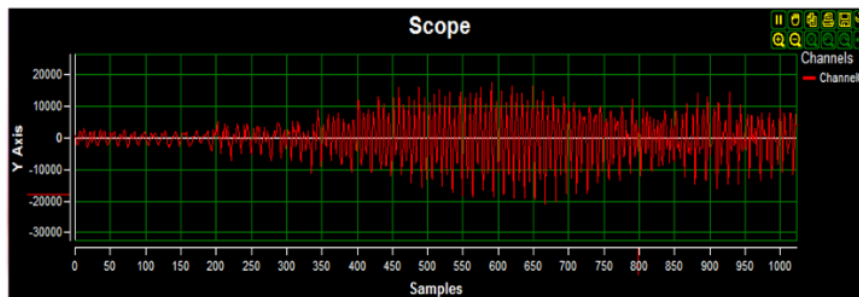

Figure 4. Results of Aceh Besar Ethnic Music Testing "Bungong Seulanga"

In Figure 5 can be seen the results of the test of Aceh Gayo music, namely "Gayo Blang" was shown through a sample voice signal on the Detecting Type of Aceh Ethnic Music System.
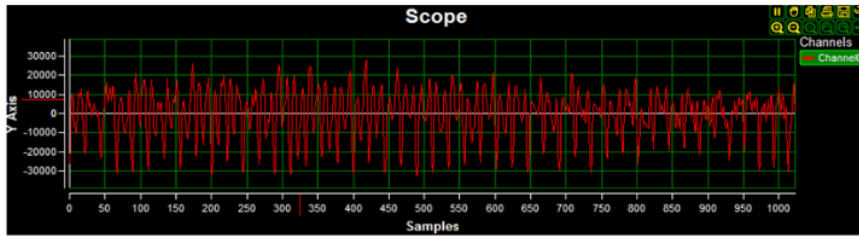
Figure 5. Results of Aceh Gayo Ethnic Music Testing "Gayo Blang"

In Figure 6 can be seen the results of the test of Aceh tamiang music "Kuntum Mende" shown through a sample voice signal on the Detecting Type of Aceh Ethnic Music System
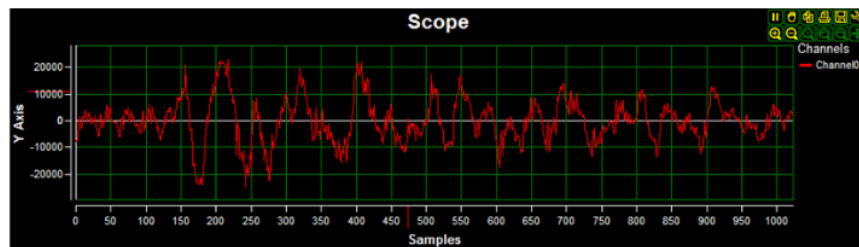

Figure 6. Results of Aceh Tamiang Ethnic Music Testing "Kuntum Mende"

Measurement of the performance of this system has a total of 4 samples in the training process and 6 samples in the testing process for each type of Acehnese ethnic music.

Table 1. Illustrate the results of performance measurement

Number of Training sounds	Number of Testing sounds	Correct Detection Amount	Incorrect Detection Amount	*Detection Rate(true)*	*Detection Rate(false)*
6	8	7	3	70 %	30%
9	8	6	4	60%	40%
8	9	7	3	70%	30%
10	9	6	4	60%	40%

From the above table it can be concluded that the success rate of this system uses the Hubbard Stratonovich method is 70% of each training and testing sample.

5. Conclusion
The conclusions of this study are as follows:
1. Hubbard Stratonovich Transformation can be used as an algorithm in the detection system of aceh ethnic types of music through voice.
2. The results of this research shows the performance rate of the detection rate system is strongly influenced by the amount of training.
3. The tests conducted on Aceh Besar ethnic music and Aceh Gayo resulted in an introduction rate of 70% and not achieve is 30%. Whereas for the Aceh Tamiang ethnic music produced an introduction rate of 60% and did not achieve is 40%.

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