

ABSTRACT

The use of speech signals is one of the characteristics of the development of technology. Speech recognition can replace the function of a tool, for example replacing the switch function on the fan. Using the switch is still less efficient because it takes time to press the switch. Therefore, the author designed a fan rotation speed control system that utilizes speech recognition using arduino.

The fan's rotation speed control system begins with recording sound through a microphone, then processed on a laptop using Arduino IDE and python software. The speech recognition process consists of data acquisition, *pre-processing*, character extraction, object classification, speech result determination, and serial communication with arduino microcontrollers.

This fan rotation speed control system utilizes the *Mel Frequency Cepstral Coefficient* (MFCC) method to extradite the *Artificial Neural Network* (ANN) method for object classification. This speech recognition program has been successfully created and works as expected. In this program displays the extraction results of MFCC traits and speech that are successfully recognized. The program is tested at multiple distances resulting in different levels of accuracy each distance. At a distance of 30 cm in silence resulted in an accuracy of 96% while in crowded conditions resulted in an accuracy of 93%, accuracy for a distance of 50 cm in silence is 93% while in crowded circumstances it produces an accuracy of 90%, accuracy at a distance of 1 meter in silence of 93% while in crowded circumstances produces an accuracy of 90%, and accuracy for distance of 2,5 meters in silence is 90% while in crowded circumstances it produces an accuracy of 87%. The result of the feasibility of this system in silence is 93% and in a crowded state of 90% with a system response time of 1 second. In the speech recognition program for fan rotation speed control, it recognizes only three kinds of speech, namely the words hidup, mati, and dua.

Keywords : Human Speech, Mel Frequency Cepstral Coefficient, Artificial Neural Network, Speech Recognition "hidup", "mati", and "dua".