

ABSTRACT

The sensitivity of human hearing is very limited. Human has very slow response to changes in their noisy environment. Similarly, they have problems when listening to the loud speakers. When the noise environment changes, the sound of the speakers will becomes louder or weaker. This limitation is due to the limitation of hearing sensitivity. When listening to a sound, people focus more on the information contained in the sound carrier and they miss to realize which level the volume of the sound is. After hearing the carrier volume of the sound is too soft or too loud, then they just realize about the volume of the sound has changed, but these changes have occurred some minutes before.

Based on these problems, a speaker is built that can set their own volume based on the noise level of the surrounding environment. The concept used is to process the sensor input sound when the speaker does not emit sound, or in other words when voltage is equal to zero. So it is understood the sound is detected by the sensor is the true noise from the loudspeaker. The ATmega16 is used to perform the processing of the large volume changes with fuzzy logic method. Value of the changing volume will be sent to the AD8403 digital potentiometer instead of analog potentiometer.

The largest error in the measurement AD8403 digital potentiometer value is 3% with average error is 0.45%. The largest error from system fuzzy is 7% eith average error is 2.28%.

Keywords: loudspeaker, microcontroller, voice, digital potentiometer, fuzzy logic.