ABSTRACT

Lately in the province of Papua there is an organisation that is rebelling against the Indonesian state. This organisation is also called the Free Papua Organisation (OPM) or commonly referred to as the Armed Criminal Group (KKB). The rebellion carried out by the OPM or KKB uses firearms that can endanger the TNI-Polri and civilians. The use of firearms will emit an explosive sound when the firearm is fired.

In this modern era, the use of a gunshot direction detector will be very helpful in efforts to secure the area carried out by the TNI and Polri. The gunshot direction detector is an effort to find out the direction of origin of gunshots that can help the TNI-Polri to find out the position of the OPM or KKB. However, gunshots are often mixed with ambient sound or what is commonly called noise. This noise can interfere with the process of detecting the direction of gunshots so that a filtering method called denoising is needed to reduce or even disappear the noise. The sound filtering method that will be used is the Normalise Least Mean Square (NLMS) method. NLMS is an adaptive filter that can suppress noise from signals affected by noise.

The results obtained by using the NLMS algorithm in this study can suppress the noise contained in the gunshot signal very well. The denoising process with the NLMS algorithm on the shot sound data of Sniper AX cal. 7.62mm on the recording results with a distance of 100 cm or 1 meter shows the average SNR value of 31.65 dB with a very good MSE average value of 0.0000020.

Keywords: *Filter Normalize Least Mean Square (NLMS), Least Mean Square (LMS), denoising, noise, Signal to Noise Ratio (SNR), Mean Square Error (MSE)*