

ABSTRACT

Ground Penetrating Radar (GPR) is kind of radar that used to detect metal and non-metal buried objects. This application working by detecting object based on electromagnetic impulse response which is radiated by transmitting antenna and hit object on the ground. After hit object some impulse are reflected to the receiving antenna. In receiver the reflected signal will be processed after strengthening process by *Low Noise Amplifier (LNA)*. In GPR application, data processing is used to clean receive signal from *clutter* and *noise* .

Signal cleaning is done to get the easier data to identificate kind and position of the object. In this final project cleaning signal methods are based on image processing with alignment and de-noising process.

Alignment process is used to enhance B-scan image which is shifting caused by non-ideal condition when collecting data. This process using edge detection to get information about width and high of the shifthing also how many region formed by shifthed effect. Next, de-noising process which are cleaning clutter and noise also clarify the detected object, are use Discrete Cosine Transform and Discrete Wavelet Transform. In Discrete Cosine Transform, de-noising process get image with clearly object is reached when the image has increasing 7.3885 dB of SNR but in Discrete Wavelet Transform, de-noising process produce image with none clearly the detected object though has higher increasing SNR value.

Key Words: GPR, B-Scan, Clutter, Noise, Image Processing