

## **ABSTRACT**

The development of information and communication technologies are increasingly rapidly. Variety of activities about sending and downloading data from internet and the other sources make a lot of people want to protect their own works. Until now, protecting data with digital watermarking techniques are vary widely. Various methods are used and even combined to produce a qualified watermarked data.

This final project has simulated watermarking system on digital grayscale and RGB image by inserting grayscale image into it. The first step begins with doing contourlet transformation on the host and watermark images. The next step, using a genetic algorithm to select the best coefficients host as a place to embed watermark coefficients.

From the research result, watermarking system based on contourlet transform with genetic algorithm producing watermarked host image PSNR 38.0117 dB as the highest and 35.2337 dB as the lowest value. For the extraction process, the extracted watermark without attack has 0.92386 as the highest and 0.89892 as the lowest values of NC. However, the watermarking system is still vulnerable to some type of noise because contourlet transform is very sensitive to physical changes of the input image.

**Keyword :** Watermarking, Image, Contourlet Transform, Genetic Algorithm, Performance Parameter.