

## ABSTRACT

Delivering and accessing process of digital image is easier in line with the developing era and the multimedia network that gets wider. The benefit has made people change information they want freely, so that a protection system of datas needed. Data protection of digital system can be *criptography* and *watermarking* method. *Criptography* method is a method used to randomize data become *chipertext* using a *criptography* key. *Criptography* is focused on the security during the data's distribution process. *Watermarking* method is a method used to insert data with a *watermark* data. *Watermarking* focused on the protection of copyright data.

The objective of the Final Project is to develop a *watermarking* image system using a level one Haar Wavelet transformation. RSA Algorithm is one of keys on *criptography* used to randomize *watermark* data such as image and Independent Component Analysis as *watermark* extraction. RSA Algorithm which encryption and decryption process are based on prime number and aritmatic module so it is expected that *watermark* image is not easily detected and the security of *watermark* data can be improved.

The important parameter affecting performance image *watermarking* system is mean square error (MSE) and mean opinion score (MOS). From simulation of image *watermarking* with randomizing *watermark* image using RSA Algorithm resulted MSE  $1.48 \cdot 10^{-14}\%$  for image watermarking without noise distortion. Reliability test of this *watermarking* scheme is done by giving noise, JPEG compression and *rescaling* in *watermark* image. Based on result simulation can be known MSE value when given noise uniform is 13.9176%, for JPEG compression 42.9841%, and 42.6666% for *rescaling*.