Abstract

Hadamard transformation is one of digital image transformation that has fast processing time and easy to implement in hardware because its transformation matrix consists number -1 and 1. Hadamard transformation can also be used in watermarking that useful to protect copyright and it can be categorized in a block-based watermarking. Blocks of image also have certain characteristics, and one of the characteristics is the variance value of the block.

The research was conducted to implement watermarking using Hadamard transformation on blocks of image that have small variance (or they can be called as homogeneous blocks) for increasing the invisibility of the watermark and was implemented on intensity plane in HSI color model because modification on this plane will not have much effect on color images.

Results from the research show that watermarking with Hadamard transformation on the homogeneous block is quite resistant to attack the histogram equalization, sharpening, darkening, enlarged resize, and JPEG compression with quality above 60%. Other attacks such as mean filtering, blurring, brightening, and cropping especially when the embedded block is missing, the watermarking is not sufficiently resistant. In addition, the effect of embedding in homogeneous blocks is the quality of the watermarked image had improved and homogeneous block on different image will also give different results as well.

Keywords: *watermarking, Hadamard transformation, block based, homogeneous block, intensity plane, HSI.*