

## ABSTRACT

Batik is one of Indonesia's cultural heritage should be preserved and developed. Various methods have been used to appreciate the form of Batik by community preservation. Besides wearing a batik cloth in everyday dress, how else can do is, by creating variations of batik motifs. Variation of batik can be done manually by batik designers, or people who are experts in the field. In order for the process of creating batik pattern variations can be done easily and can be done by everyone, so in this final, made an application which can produce variations of batik motifs.

Applications are made in this thesis using Genetic Algorithm, which is used in the process of selecting the composition and position of several shapes and colors, to be used as a motif. Genetic algorithm is an algorithm that adapts the process of evolution, where every generation produces a better solution or as good. Besides using Genetic Algorithm, used the concept of Fractals. Use of Fractals concept aims to produce variations of the motif has the general characteristics of batik, which on batik motives, there is often repetition of the same shape, which resembles the motif itself.

In performance testing Genetic Algorithm, in discovering the composition of form and color matching, carried out by varying the parameter values evolution Genetic Algorithm. From the testing that has been done, when the value of crossover probability = 1, probability of mutation = 0.33, the number of iterations = 20 and space population = 50, solutions yielded by the Genetic Algorithm to reach the highest fitness.

In addition, we also performed testing on the quality of batik pattern variations. Tests conducted using a questionnaire to 20 people, 15 people experts and ordinary people 5 people. From the results of the questionnaire, assessing motives correspondent to variations produced, amounting to 85% rate the quality of the motif is directly proportional to the magnitude of fitness. Moreover, the conclusion, the difference of fractal dimension on a motive, an effect more on the quality of the resulting patterns of variation, compared to the color and shape.

**Keywords:** Genetic Algorithms, Fractals Concepts, probability of crossover, mutation, the number of iterations, the population space, a fitness