This paper presents the use of a Genetic Algorithm to find the optimal layout for the placement of garment patterns on a fabric of fixed width to minimize fabric waste. We developed a program to simulate garment pieces and their layout on a fixed-width fabric. Each piece in the order book is placed with 2 possible orientations: 0 degrees and 180 degrees. The efficiency is measured by the length of fabric used after all the patterns in the order book have been laid out. A comparison is made between the placement using our proposed genetic algorithm to that made by an expert human using our simulation program.

The results from our experiments on various pattern designs indicate that our genetic algorithm can effectively be used to obtain highly efficient solutions, comparable to that done by an expert while using a reasonable amount of time. The algorithm can also be adapted for use in other areas related to optimal consumption of sheet material such as metal, paper, and leather.