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**Using genetic algorithms to search for an optimal portfolio strategy and test market efficiency** HAOWEN XI, EDWARD MANDERE, Bowling Green State University — In this numerical experiment we used genetic algorithms to search for an optimal portfolio investment strategy. The algorithm involves having a "manager" who divides his capital among various "experts" each of whom has a simple fixed investment strategy. The expert strategies act like population of genes which experiencing selection, mutation and crossover during evolution process. The genetic algorithm was run on actual portfolio with stock data (DowJones 30 stocks). We found that the genetic algorithm overwhelmingly selected optimal strategy that closely resembles a simple buy and hold portfolio, that is, evenly distribute the capital among all stocks. This study shows that market is very efficient, and one possible practical way to gauge market efficiency is to measure the difference between an optimal portfolio return and a simple buy and hold portfolio return.

Edward Mandere
Bowling Green State University

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