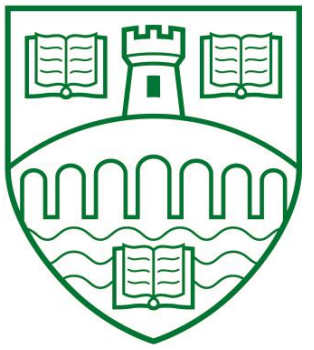# A Trading System Built by Genetic Algorithm
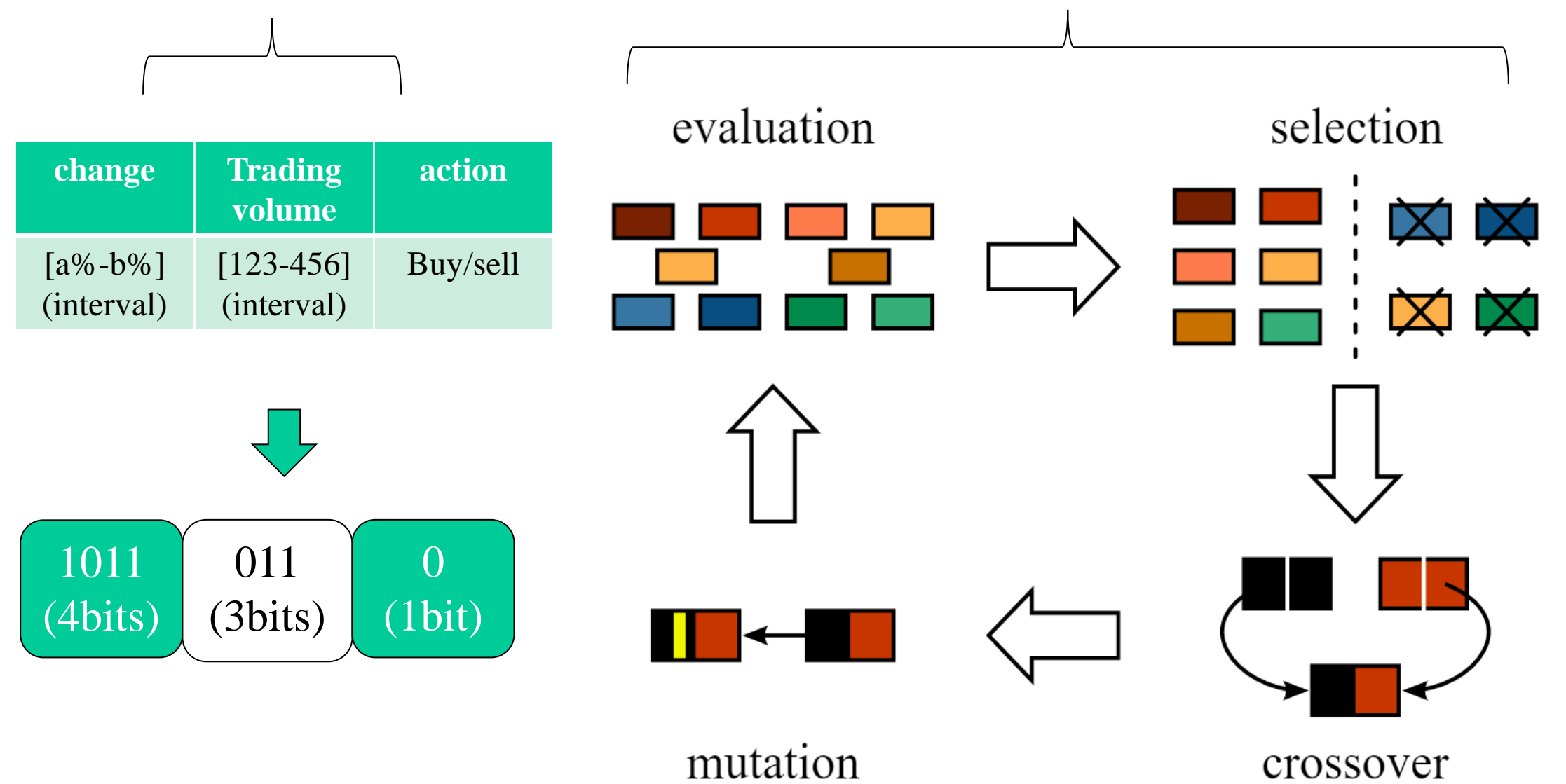
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MSc in Computing for Financial Market

Genetic Algorithm (GA) is a metaheuristic inspired by the process of natural evolution. It uses bio-inspired operators such as mutation, crossover and selection to find a good enough solution of a problem. In this case, trading rules are transformed to binary code to represent chromosomes in the first step. Then, with GA, the best trading rules in the training period are picked to check the performance in the test period.

Trading Rules Transformation ▷ **Genetic Algorithm** ▷ **Performance Evaluation**

change	Trading volume	action
[a%-b%] (interval)	[123-456] (interval)	Buy/sell

1011 (4bits)	011 (3bits)	0 (1bit)

Binary Coding:
Transforming trading rules to binary data to represent chromosomes

evaluation

selection

mutation

crossover

Evaluation: To calculate the fitness(profit)
Selection: To pick to survival of the fittest
Crossover: To mate between individuals
Mutation: To introduces random modifications

Evaluation: In the simulation of performance, the best trading rules are applied to trade on the data from test period, and the profit is the fitness.
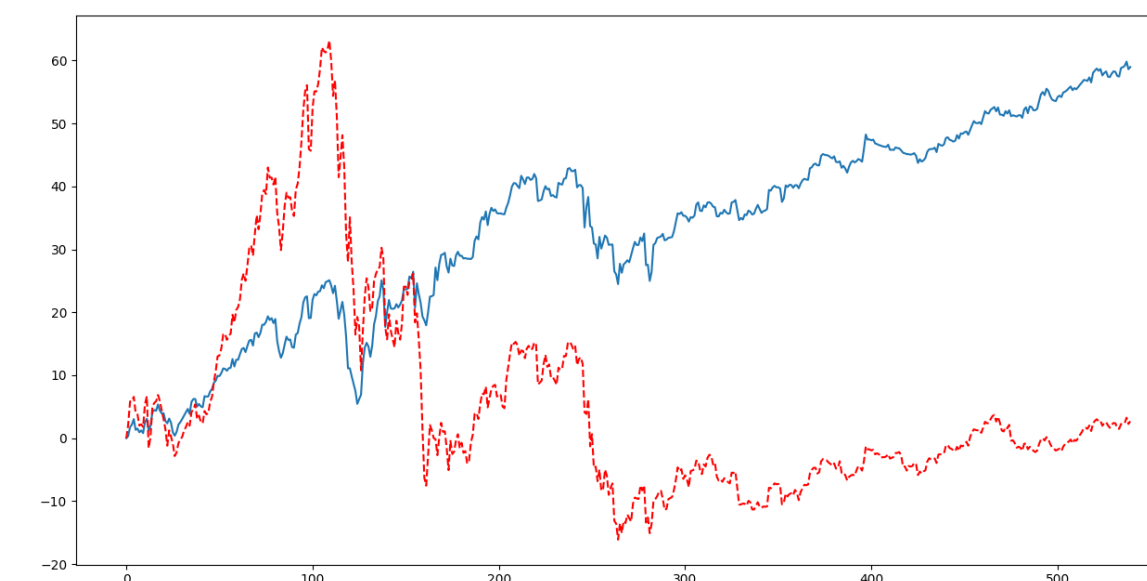
The upper chart is the performance of GA on Shanghai index(red line is the benchmark: buy-and-hold strategy)
The lower chart is the performance of GA on stock 600000(red line is the benchmark: buy-and-hold)
(data from 2014-7-7 to 2017-7-7)
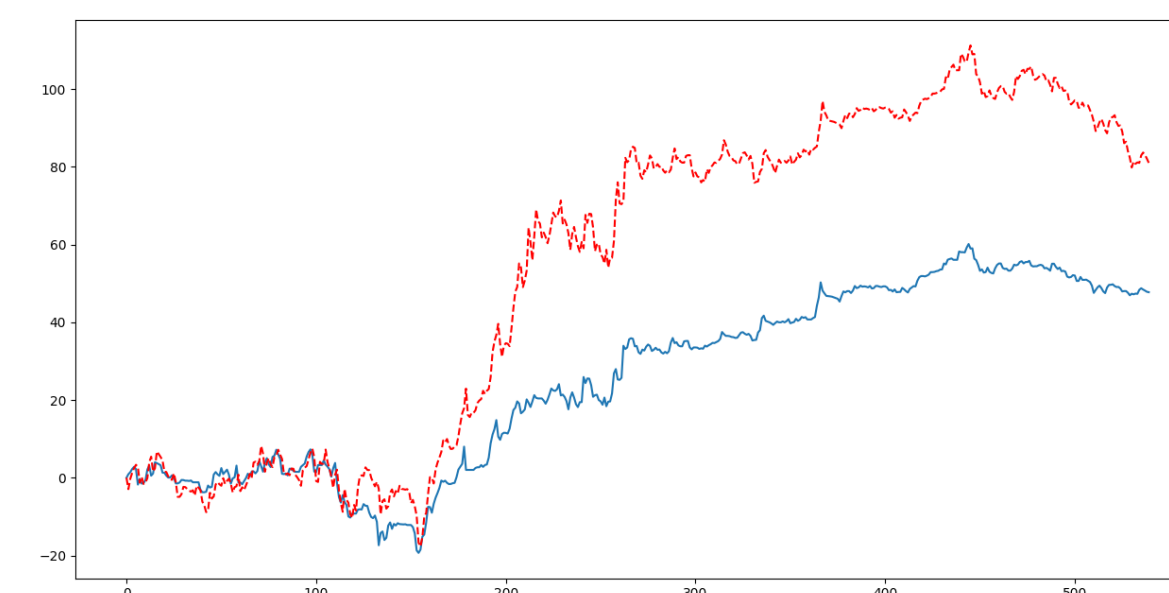
It is clear to figure out that the algorithm works well when the market goes down and can not outperform the benchmark when it is going up.