Chapter 11
Using Genetic Algorithms to Develop Investment Strategies

ABSTRACT

Genetic algorithms (GAs) are a powerful search technique. The use of genetic algorithms (GAs) will help in the development of better trading systems. The genetic algorithms (GAs) help the researcher to explore various combinations of trading rules or their parameters, which the human mind is unable to find. This chapter explains genetic algorithms (GAs) in brief and gives insight on how they find better trading strategies. Some of the manual trading strategies are good in nature. Genetic algorithms (GAs) only addition to them. Interfacing genetic algorithms (GAs) with stock trading systems or developing a combined model requires a large degree of imagination and creativity. It is an art not a scientific invention. Genetic algorithms (GAs) make use of computers to find various interesting trading systems.

11.1 INTRODUCTION

With the availability of huge processing power and memory at cheap rates at your door step in past decades. It has been helpful to develop new trading strategies to forecast stock data. This has result in creating new generation Artificial Intelligence (AI) based systems which are known as expert systems popularly. Many algorithms has also comes into picture to support them. Genetic Algorithms (GA's) is one such type of technique which is used as an optimizer in common to generate various trading rules or their best parameters

DOI: 10.4018/978-1-7998-4105-0.ch011

(Bauer, 1994). These artificial intelligence based systems are so powerful that no human intervention can match their results, as human mind has limited processing ability or cognitive power. But by a large decision or results by these expert systems are much superior then given by traditional systems. Genetic Algorithms (GA's) based expert systems are of flexible in nature and changes their working according to the market conditions. They are of self evolving in nature and take their learning's from the past. Results or solution find by them are of superior in nature and we cannot dream of finding such solutions by traditional optimization techniques. Of all optimizers present and past researches has found that Genetic Algorithms (GA's) are of most innovative and powerful in nature. Results are of promising in nature as we had applied them in past data and Genetic Algorithms (GA's) is replacing past traditional statistical based traditional search methods firstly.

Genetic Algorithms (GA's) are simple in nature as they are inspired by biological evolution. Genetic Algorithms (GA's) process is generally a artificial simulation in nature i.e its selection and survival of fittest (Goldberg, 2002). It is based on Darwin theory of survival of fittest. Genetic Algorithms (GA's) has found its application in a large number of areas in addition to the stock market domain. Past researchers have shown that Genetic Algorithms (GA's) has been successful in each and every domain.

11.2 GENETIC ALGORITHMS (GA'S) PAST HISTORY

Genetic Algorithms (GA's) are based on Darwin theory of natural selection and survival of fittest (Rajasekaran et. Al, 2007). The stock market domain problems generally posses a large search with almost infinite combinations. Genetic Algorithms (GA's) basically search in many dimensions in a search spaces. In this procedure many new vantage points are found not just one. Genetic Algorithms (GA's) generate a large number of solutions. Thus selection in combination with other intelligent operators consistently improves the fitness function, generation after generation. Nature has got a lot of power to evolve itself under various changing circumstances. Genetic Algorithms (GA's) is just the mimic of nature evolution in a computer program. First attempt to mimic the working of nature was done in 1950's and 1960's. These attempts were unsuccessful as proper balance between the operators is not successfully done.

In 1960's John Holland along with his students in University of Michigan developed Genetic Algorithms (GA's) with selection, crossover and