Chapter 1
Introduction

Abstract This chapter presents an overview of the work and its structure. In Sect. 1.1 the goals are described, in Sect. 1.2 the main improvements in the work's subject area and in Sect. 1.3 the structure of this book is detailed.

1.1 Work's Purpose

The aim of this work is to create an application of pattern discovery and based on that predict the stock market behavior. A new methodology, named SIR/GA, to identify patterns in the historical prices of stocks will be developed. After identify patterns, the goal is to create investment rules based on the pattern discovered. In order to achieve this goal, the GA will be used to find a set of patterns and investment rules that allows finding the best investment strategy.

The last goal is to outperform, in terms of total return, the Buy and Hold strategy with the new SIR/GA approach. The application must be able to make automatic investment decisions based on the detection of patterns in the historical prices of stocks.

1.2 Main Contributions

The main contributions made in this work are:

- The creation of the new methodology to identify patterns that combines rules between PIPs with the mapping between those rules and different characters in the SAX representation.
- The combination of multiple exit/sell methods namely time, price, and pattern.
- The use of a GA adaptive approach able to automatically identify multiple patterns and generate trading rules.

1.3   Document Structure

This document is organized as follows:

- Chapter 2 addresses the theory behind the developed work, including technical analysis, technical indicators, and soft computing methodologies. Also, in this chapter, are presented and analyzed several and different methodologies regarding the identification of patterns.
- Chapter 3 describes the new approach SIR/GA methodology for pattern discovery and also the architecture of the proposed solution.
- Chapter 4 describes first the metrics used to evaluate the developed solution and second three case studies where the solution was tested.
- Chapter 5 summarizes the provided report and supplies the respective conclusion and future work.