Introduction

Researchers and investors conducted extensive research related to technical analysis for decades in various financial fields and technical trading rules have been treated as one of the effective ways to generate trading signals. Among different approaches, momentum strategy is the most well tested strategy that may generate profit continuously.

Traditionally, momentum investing involves a strict set of rules based on [technical indicators](https://www.investopedia.com/terms/t/technicalindicator.asp) that dictate market entry and exit points for particular securities. Momentum investors sometimes use two longer-term moving averages, one a bit shorter than the other, for trading signals. Some use 50-day and 200-day moving averages, for example. The 50-day crossing above the 200-day creates a buy signal. A 50-day crossing back below the 200-day creates a sell signal. A few momentum investors prefer to use even longer-term moving averages for signaling purposes.

Evolutionary algorithms such as genetic programming allow a system to automatically generate and adapt trading rules according to certain criteria. Developed by [11], genetic algorithms were combined with technical trading rules. Bauer [12] reported that systems built based on genetic algorithms were able to generate positive excess returns in the US exchange market. However, genetic programming was argued to be more appropriate in extracting trading rules from historical data because of its special structure [13]. A flexible framework for adjusting the trading rules to the current environment was presented in [14]. With the application of genetic programing to the financial industry, researchers tested its capability of generating excess returns using a data set from different markets and different assets.

Most recently, the filter, a revised version of Hodrick–Prescott (H-P) filtering, is proposed by Kim to extract the estimated trend for momentum strategy by substituting a sum of absolute values ( norm) for the sum of squares used in H-P filtering to penalize variations in the estimated trend. The trend filtering method produces trend estimates that are piecewise linear, and therefore it is well suited to analyzing time series with an underlying piecewise linear trend. By accurate estimation of the price drift, a momentum can be addressed by tuning the exposure between equity and fixed income instrument dynamically.

In this report, we will reproduce the result declared by Kim to make sure the correctness of the framework and then extend the model to an intra-day scenario where 0005.HK and 0700.HK are used as the sample inputs and we also will compare the PnL among and H-P filters to prove the effectiveness by using the filter.

Methodology









