INTRODUCTION TO ALGO TRADING – HOW RETAIL TRADERS CAN SUCCESSFULLY COMPETE WITH PROFESSIONAL TRADERS

By Kevin J. Davey
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INTRODUCTION

6:20 AM Saturday morning could not come quickly enough. That was usually the time I would hear the familiar “thunk” of a rolled up copy of the Los Angeles Times newspaper hitting my condo’s front door. That was if the delivery person had good aim that day. Some days the bushes nearby would welcome the paper with open arms (branches?) instead. Other days the newspaper never arrived at all. But on this Saturday I heard the paper hit the door, and when I did, I knew it was time to prepare for Monday’s trading.

Scrambling out of bed, I opened the door, grabbed the newspaper, and tore it apart until I found the Business section. Towards the back was the data I was looking for – the information that would, in a short time, make me fabulously wealthy (or so I thought): the daily commodity prices for the previous day.

As you may have guessed, this was back before computers took over and daily and intraday data was accessible with a few keystrokes. This was old school to the max – everything was on paper!

Anyhow, I scanned the commodity prices and found the prices for Live Hogs, as it was called back then (it is Lean Hogs now). I took the closing price for the nearest month’s contract, and copied it to a paper sheet that had 6 columns in it: date, closing price, 4 period average, 9 period average, 14 period average and signal.

I diligently calculated each average by hand – remember, I had no computer to help me back then – and then I compared the results to my rules:

9 period average greater than the 14 period average? Yes!
4 period average greater than the 9 period average? Yes!!
Closing price crossing above the 4 period average? Yes!!!!

That was it – everything was yes and I had a long signal! Monday morning, I would place an order to buy 1 live hog contract at the market. I dutifully wrote “GO LONG” in the signal column, cementing the trade in my mind.
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Figure 1 - Old School Algo Trading, By Hand!

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<th>9 AVG</th>
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Figure 2 - Algo Buy Signal, With Modern Technology
I was nervous, excited and in a dream state the rest of the weekend – my first real commodity trade!

I did not know it, but even back in those old days I was trading algorithmically, or “algo” trading. I was trading according to a precise set a rules, which when you boil it down, is all algorithmic trading really is.

Back then, traders referred to it as systematic trading, mechanical trading or rules based trading. A few years ago, many people spoke of robot or “bot” trading. But until recently, very few used the term algorithmic. Yet, it is all basically the same thing.

So, realize whenever someone mentions one of these terms – mechanical, systematic, rule based or algorithmic trading - they are likely referring to the same thing: a set of rules that tell you when to enter and exit a trade. These rules could be on a computer, in your head, or as was the case for me in the early days, written on good ol’ paper.

That is the first lesson of this book – **algo trading = rules to trade by**.

There are many more lessons in this book, all designed to introduce you to the world of algorithmic trading. This type of trading applies for many different instruments: stocks, ETFs, forex, futures, and options to name a few. Don’t let the terms algorithmic or algo scare you; in this book I’ll walk you through the basics of algorithmic trading:

- A Discussion of What Exactly Algo Trading Is, and What It Is Not
- The Basics of Algo Trading, For Beginner to Intermediate Traders
- Figuring Out If Algo Trading Is Something You Should Consider
- The Many Advantages of Algo Trading
- The Disadvantages of Algo Trading
- How To Begin Algo Trading On Your Own
- Selecting a Trading Software Platform
- Learning the Basics Of Your Platform
- Learning To Program In Your Platform’s Language
- A Simple Algo To Get You Started
- Tips For Successful Algorithmic Trading
- Steps To Take After You Read This Book

The intent of this book is not to teach you the basics of trading in general; there are plenty of other books available on that subject. This book is intended to get you started with algo trading, with the assumption you know some trading basics. I feel strongly that algo trading is a great way for smaller retail traders to compete against professional traders.
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By the end of the book, you won’t be scared off when people talk about trading algos. You’ll know the basics, and also have a plan for your future endeavors in algorithmic trading.

With that, let’s get started on the journey!
CHAPTER 1 – THE DIFFERENT TYPES OF TRADING

“Algos” and “algorithms.” These two words strike fear into the hearts of many a trader. Visions of computer programs running wild, buying and selling with reckless abandon, are a common nightmare. A trader goes to sleep flat, and wakes up to find a rogue robot algorithm frittered away his or her account, buying and selling all night, due to a simple programming bug.
Or worse yet, the trader wakes up to find he is short 100 ES (mini S&P) contracts, when he only wanted to be short one contract!

Maybe instead your nightmare vision is of hedge funds, executing “killer bot” algos with lightning speed, draining the accounts of all the slower traders.

The truth, of course, is that trading algos can do those things, and worse. Horror stories abound of these sorts of account killing computer codes. These exact nightmare scenarios have happened. But, properly designed algos can also be friendly, too.

I obviously will focus on the friendly algos!

But before I dive into details of algos, it is important to discuss some of the different types of trading. That will help you understand what an algo is, what it can do, and most importantly, what it cannot do.
Discretionary Trading

Most retail people out there are discretionary traders. Discretionary simply means traders use some sort of judgment to enter and exit trades.

For example, a trader hears about a hot stock on CNBC, and immediately decides to buy some. That is discretionary trading.

Another trader has a chart that she stares at all day. It may be filled with indicators, trendlines, moving averages, etc. Or it may be naked, except for price data. Once that trader makes a trade decision based on all she sees, that is a discretionary trade.

Our third trader has a DOM ladder only, a visual tool which shows all the resting buy and sell orders along with prices. He trades based on this tool. He is likely a discretionary trader, too.

At the end of the day, if you asked any of these traders about why they took certain trades, and why they avoided taking other trades (that may have looked exactly the same), they might give you a “deer in the headlights” look, or a vague response like “I don’t know, it just felt right!”

The truth is discretionary traders may or may not have rules, they may or may not follow these rules, and they may not be consistent in applying these rules. Heck, they might not even be able to describe the rules that caused them to trade.

I remember being in a trading room with a “price action” guru a while back. He was calling the market live, and it went something like this: “yes, the market is looking weak, and there is a short setup here that I usually take, so I am just waiting for a short entry…waiting…waiting…no, it’s a long trade! I just got out with a profit!”

Huh?

When asked about it later, the guru could not explain how a textbook (according to him) short entry suddenly turned into a profitable long scalp trade. “It just felt right,” he explained.

It made me wonder if he was even live trading, but that is another story. The point is that he was trading (likely simulated trading) in a discretionary fashion.

Discretionary trading, then, involves trading decisions that involve some degree of human judgment. Maybe it is intuition, or a sixth sense, or even random guessing, but the trade selection usually includes something that can’t quite be defined or tested.

Now, that type of trading might sound wrong to you (“who trades based on intuition?”) or it may sound appealing (“great, I get to use my brain to help me decide!”). But the fact is many people do it, and some people are successful at it. It is a legitimate way to trade.

Yet discretionary trading is definitely NOT algorithmic trading.

I’m guessing, if you are reading this book, chances are you might have already tried and failed at discretionary trading. Don’t feel bad, I count myself in your ranks
– I was never a good discretionary trader. That is the main reason I dove into algo trading.

**Algorithmic Trading**

Algo trading is all about rules. In fact, it is nothing but rules. No discretion. No human judgment.

Trading algorithms can be as simple as you want, or as complicated as you want. How simple? Here is a basic 2 line strategy:

- If close $< \text{average close of last 5 bars}$, go long
- If close $> \text{average close of last 5 bars}$, go short

Over the past 13 years, this strategy would have made over $92,000 after slippage and commissions, trading just one contract! And it makes money on both the long and short side! Don’t get too excited though, the last few years have not been kind to this strategy...
Figure 5 - A Simple (But Not Consistently Profitable) Algo Equity Curve
That was a very simple algo. In contrast, algorithmic strategies can also be extremely complicated, too. There are traders with single algorithms that run 25,000 lines of code or more – real rocket science stuff!

There are two keys to trading algorithms:

1. They can be tested. Most algorithms can be historically tested, commonly referred to as a backtest. This turns out to be a major advantage of creating algorithms, which I’ll describe later. For algos that cannot be historically tested, they almost always can be live tested in simulation mode, with proper precautions and some caveats. In either case, the trader can usually determine the acceptability of the strategy BEFORE trading it with real money.

2. Algorithms are rigidly defined. If the algorithm sees a long setup today, it will tell you to go long. If it sees that same setup tomorrow, it will tell you to go long again. The algo only looks at what it was programmed to look at. It doesn’t care what the Fed thinks, does not care about the news, and does not care that Jim Cramer screamed that a certain stock was a buy
last night – unless, of course, you program those types of rules into your algorithm. The algo is consistent in how it follows the rules.

Many traders speak of “black boxes,” a special type of algorithm. With black boxes, the rules (the algorithm) remain hidden to the trader. He or she only gets the entry and exit signals, and has no idea how those signals were produced.

That type of algorithm might sound unappealing or scary, but many people like that approach. It is really hard to interfere with computer code you cannot even see!

**Some Examples Of Algo Trading**

So what does an algo trader look like? Here are some typical examples:

- A retail trader, trading at home. He works full time, so trading is his hobby. Every night, he downloads the latest prices, calculates his signals either by hand or on a computer, and places trades according to the rules. He may or may not check positions during the day, but since he places orders during non-work hours, he knows he is following his strategies each and every day.

- A prop trader, trading full time. He enters and exits trades all day long, again according to set rules. He never, ever deviates from the rules, since he knows his boss spot checks his trades for adherence to the rules.

- A hedge fund computer code, written by numerous PhDs in math, statistics and physics. The computer code they run has 50,000 lines of code, and does everything – enter trades, exits trades, calculates position sizing, automatically performs rollovers, etc. A junior trader is always nearby, monitoring trades in case of a malfunction, but the computer controls the show. The strategies they run can be on the order of microseconds (in and out quickly), to day trades of a few hours, to swing trades lasting weeks.

- A professional retail trader, using a standard retail platform, Tradestation. He creates strategies, then lets Tradestation run those strategies automated. He is usually closely monitoring positions, because as Tradestation personnel say “automated trading does not mean unattended trading.” He can trade quite a few automated strategies, assuming he has enough capital, and if his strategies are diversified enough.

What makes these people algorithmic traders is that they follow strict rules for entry and exit. That is the real key – they are 100% rule followers. With those strict rules, they can historically backtest their approaches, and while “past performance is
not indicative of future results” (as a U.S. government disclaimer correctly states), it is very nice to realize that the strategies traded have worked in the past. Many traders can’t commit to 100% rule following, so they fall into the last major category – hybrid trading.

Hybrid Trading

Now that I have discussed discretionary trading, and algorithmic trading, it is time to bring another type of trading into the mix – what I call hybrid trading. Hybrid trading is simply a mix of discretionary and algo trading. Some examples:

- Entries are based on technical indicators and rules, but exits are left to the discretion of the trader
- Entries are based on trader judgment, but once in a trade, an automated exit “bot” controls the trade, with no trader intervention
- Entries and exits are both well defined by rules, but the trader has discretion to overrule. For example, a trader might decide to ignore long stock signals after a natural or manmade disaster. Or a trader might decide to go flat before major world events (Brexit vote, Trump election night).

The advantage in hybrid trading is that the trader can still have some discretionary influence on the trade. That is also a disadvantage! One thing I have noticed with my own algo trading is that some of my best algo trades turn out to be ones that my “human judgment” absolutely hated! If I treated those trades as hybrid trades, I would have negated all the good effects of the algo.

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Reading the last section, you might wonder “what are the professional traders out there doing, and how can I possibly compete with them?” Great question! Pros are using all of the methods detailed above. You can compete by treating trading as a serious endeavor. Don’t wish for “I have 15 minutes a day for trading” type systems. Wish for being the best you can be at trading – then you’ll be good competition for the pros.

Of all these types of trading, it is hard to decide which trading route is for you. Throughout the book, I’ll discuss some of the characteristics and traits that make for good algorithmic traders, but for now I will assume that you already know algo trading is the path you want to pursue. If you still aren’t sure, though, keep reading and maybe by the end of the book you will be sure!
ABOUT THE AUTHOR – KEVIN DAVEY

As an award winning full time trader, and best-selling and award winning author, Kevin Davey has been an expert in the algorithmic trading world for several decades. Between 2005 and 2007, Kevin competed in the World Cup Championship of Futures Trading, where he finished first once and second twice, achieving returns in excess of 100% each year.

Kevin develops, analyzes, and tests trading strategies in every futures market from the e-mini S&P to crude oil to corn to cocoa. He currently trades full time with his personal account. He also helps small groups of traders significantly increase their trading prowess via his award winning algorithmic trading course, “Strategy Factory®.” Kevin’s Strategy Factory Workshop was awarded 2016 “Trading Course of The Year” by a prestigious trading website. More information is available at https://www.kjtradingsystems.com.


Kevin is a Summa Cum Laude graduate of The University of Michigan, with a B.S.E in aerospace engineering. Kevin also has an MBA with Technology Management Concentration from Case Western Reserve University – Weatherhead School of
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Management, where he received the Dean’s Academic Achievement Award with a perfect 4.0 grade point average.

Prior to trading full time, Kevin was Vice President of Quality and Engineering for an aerospace company that designed and manufactured flight critical components, managing over 100 engineers and support staff. For his efforts, he was honored with the prestigious “40 Under 40” Award from Crain’s Cleveland Business Magazine.

Kevin currently lives outside of Cleveland, Ohio with his wife and three children.