Why Your Algorithm Will Fail

Reason 5: Doing Things Manually

> ***"Two things are infinite: the universe and human stupidity."***
>
> **- Albert Einstein**

Humans are pretty amazing. Collectively, our brains have achieved some notable things, like inventing the wheel, putting a man on the moon, and building gravity-defying skyscrapers. However, in order to achieve these monumental feats of intellect, we needed more than just our brains. In fact, there are some very important things that separate us from the rest of the animal kingdom. If not for these things, we humans would still be living in caves, foraging for food and trying to avoid taking bigger animals to lunch. Can you guess what those things are?

Tools.

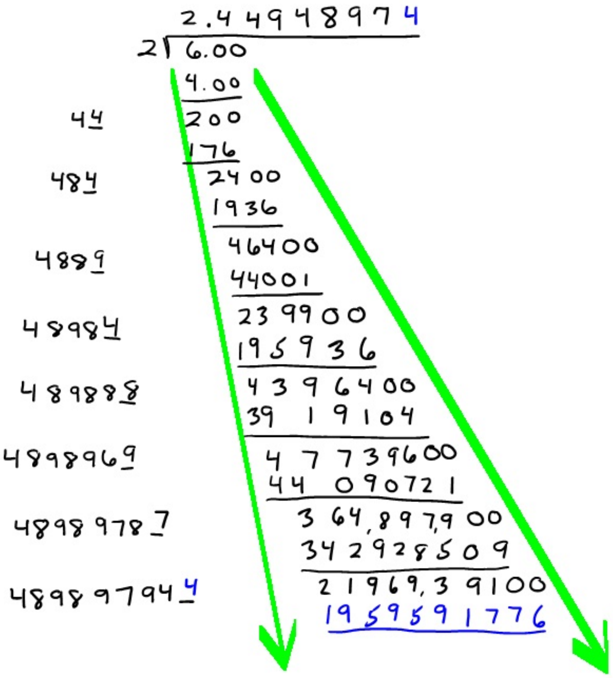
Humans have been creating tools since before the dawn of recorded time. The most important tool we ever discovered was **fire.** According to National Geographic, humans first used fire to harness the power of **cooking** about 1.8 million years ago. This innovation was directly responsible for **doubling our brain size** over the next 600,000 years, and our species' survival through the last Ice Age. Pretty cool, right?

Cooking **saved us a lot of work** by shortening digestion times and providing lots of energy. This freed up humans to constantly **innovate** better tools throughout history, such as those seen in the ensuing Stone, Bronze, Iron, Middle and Industrial Ages. Basically - fire was extremely **convenient and saved us lots of time.** But there is one recent invention that has rocked the boat for humans arguably as much as fire did: **the computer.**

Computers are the new fire for modern-day humans, and we've created them to effectively do one job: **process information.** Humans make lots of mistakes processing information because we're not purely rational creatures. Back in our caveman days, our instincts and imagination served us well, but in today's world, they get in the way of objectivity. They make us **dysfunctional** for the task.

This became a huge problem in the Industrial Age. As we began generating more information than had ever been seen before, our faulty human brains just couldn't handle it all properly -

Humans *suck* at processing information. If you need any proof of this, try calculating the square root of 6 by hand (√6). I'll wait…



Not fun, right? You can spend all day trying to figure that out, or you could simply put the problem in a calculator and **have it do the work for you - quickly and mistake-free. This is just one example of how computers enhance our functionality.** You see, since the invention of computers, humans have been freed from doing tedious tasks poorly to do what we do best: **use our imagination to innovate.**

That being said, you'll need to accept and internalize this before going any further -

Humans are not better than computers at information processing. On a true scale, you are only marginally better than a chimp at it. Your brain is literally a chicken nugget compared to the most basic CPU. Don't continue until you accept this basic fact.

So, what does this mean for us traders? To answer that question, let's turn our attention to the heart of the problem we face as *algorithmic* traders: **we have to process tons of information.** In a nutshell, that information is composed of Open, High, Low, Close, volume, and spread/commission values - repeated over and over again. That's it. It's simple information, but the fact that there's so much of it means trying to process it all with your tiny chicken nugget brain invites **disaster.**

This is why we use **specialized tools, called indicators,** to process market information. **Indicators are the result of objective mathematical computations, and their signals are based on those calculations.** They're great tools, but a big problem arises when we pair our chicken nugget brains with them -

For example, let's say you want to start building an algorithm manually. What's your first step? Well, **since you're not a computer and therefore can't iterate or process multiple instances of market data for comparative analysis, you need a**

reference point. So, you probably **"eyeball"** a small portion of history and try to find some visually appealing indicator settings that worked on it. **This is the manual version of an in-sample optimization, which is inferior in every way.**

Then, you take those settings and test maybe 100-300 historical trades, which we already know is inadequate in terms of efficiency and statistical significance. This probably takes you around 20-30 minutes on just one pair for just one parameter set on one symbol - **and that's if you're being strict about it** (accounting for news, spread, commissions, etc), **which you're probably not**. Obviously, there's just no way you can properly process all the data you need to in a reasonable amount of time, and this can cause a **lot** of frustration. That being said, I have a question for you -

Be honest: how many times have you messed with parameter settings or stopped the test once those parameters encountered a losing streak during a manual backtest?

If you're like me - too many to count. It's maddening, isn't it?

It's not your fault. Simply put, **psychology interferes with testing this way.** You see, our chicken nugget brains use a lot of energy, and that energy is limited. Spending that energy crunching numbers makes us feel drained. It also causes **laziness,** which reduces the quality of your work.

Sadly, we aren't very good at recognizing our own **laziness.** To make matters worse, **you may even think you're being productive when you're actually being lazy.** You see, our caveman brains associate productivity with **making things more**

convenient. But we're not cavemen anymore, and that instinct has gone completely haywire in modern times. **People are addicted to convenience, and that addiction negatively impacts functionality.** You see it all the time in your daily life -

We mindlessly scroll through our phones, drive above the speed limit, and eat crappy food all because it's **convenient.** The problem is, **conveniences often turn into bad habits. This universal truth applies to backtesting as well:**

In backtesting, it's **convenient** to use crude practices such as "eyeballing" or "chalks."

It's **convenient** to **not** run **OOS optimizations** to validate your parameters.

It's **convenient** to use small sample sizes to test.

It's **convenient** to just hope and pray that your system doesn't suck.

So, what *<u>do</u>* we do? -

The same thing we always do when our natural design isn't **functional** enough for a task - **use specialized tools.**

Enter: the **Expert Advisor.**

An Expert Advisor (EA) is a program which tests and/or trades based on indicators. Lucky for us, **EAs and indicators speak the same language.** You see, they are both pieces of code that perform exact functions based on **"if, then" statements,** which are also known as **conditional statements.**

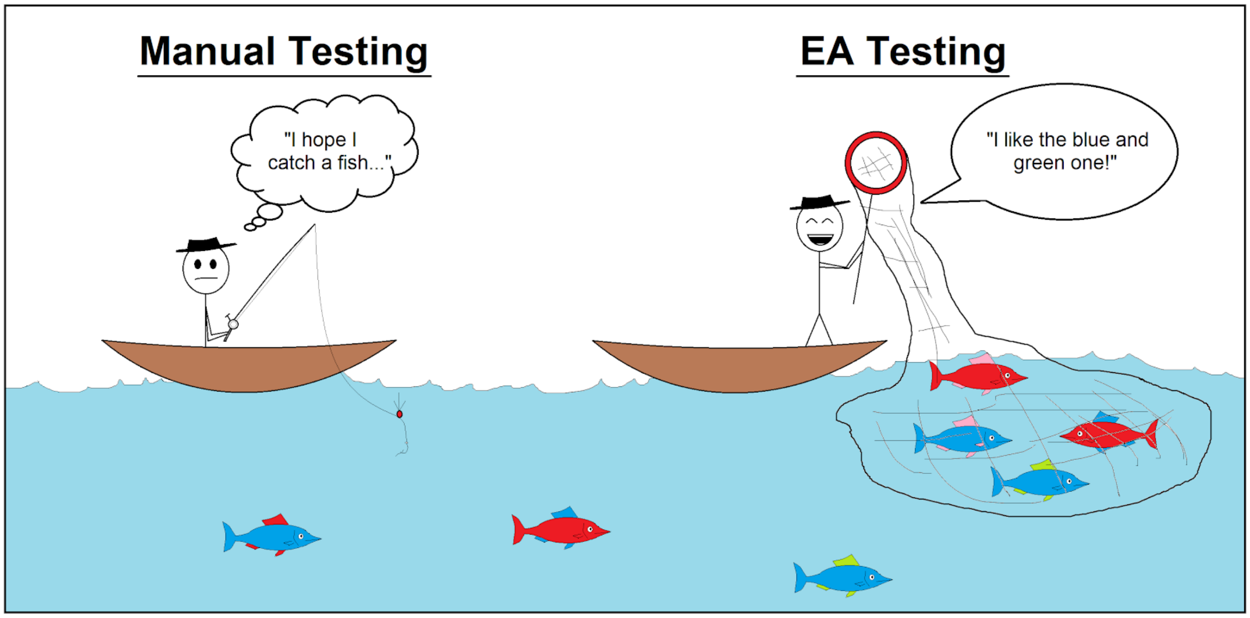
You may be reminded of the traditional **logical format: *if p, then q.*** It forms the basis of all logic. Let's try a **conditional statement** here:

If logic forms the basis of programming, then programming is logical.

Easy enough! Anyone who would like to debate that can go back to elementary school.

EAs, like all programs, execute their programming flawlessly. There are only two potentials for error in an **EA's** function: the chicken nugget-brained designer, or the chicken nugget-brained user. Like any other tool in existence, when an **EA** is designed well, the main potential for error lies with the user.

EAs are amazing because they can perform tasks that would take us hundreds of years in just minutes. Instead of wasting time testing parameters with the hopes of finding ones that will work, **EAs** test **every** parameter within a range over a defined amount of time and let you decide which ones you want. This is most easily compared to fishing. If you want to catch one fish, you use a fishing hook and pole. If you want to catch a lot of fish, you **use a net.** In terms of efficiency, there's just no comparison:



If you're like me before I started using **EAs**, you may be afraid to use an **EA.** That's most likely because you don't know how to build confidence in one. **To make sure an EA works properly, apply the Agile approach to testing its features.** Start with the most basic components, and work your way up, in terms of complexity. Once you're sure the functions work properly, start the real testing. Simple!

By this point, you should realize why you can't rely on doing things manually for systemic evaluation, but in case you need it spelled out, here's a nice numbered list about **why manual backtesting sucks:**

1. It's imprecise. As algorithmic traders, we use **indicators,** and **indicators are the result of an exact mathematical calculation.** It's plain stupid to pair this precision with shoddy estimation.

2. It's subject to psychological interference. Remember, your brain is a chicken nugget. Enough said.

3. It's slow as $%@# (and basically impossible because of it)!

4. Because of the sheer amount of information you're trying to process, you're forced to use **convenient but poor** test practices.

5. It's impossible to apply the **Agile approach** when you are forced into **convenience, rather than functionality.**

With that being said, all technology must be updated, including **EAs.** Whenever newer, more efficient technology comes out, you'd best make an effort to take advantage of it. You see, although you may already be using an **EA** to test, chances are, you aren't using one with all of the capabilities currently available -

MT4 testers, I'm talking to you.

We have some amazing technology at our disposal in this day and age, so you'd better put it to good use -

Or you'll be left behind by everyone who does.

In the next article, we'll wrap the series up with the last point of failure in your testing practices. Chances are, ALL of you are doing this:

Using old technology.