We're Doing It Wrong

December 4, 2018 by Ben Hunt

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Ed. Note: next week we will announce the Epsilon Theory Professional Service, where financial advisors and investment professionals can tap directly into our Narrative Machine market research and analysis. This week we'll be highlighting specific investment applications we'll be offering as part of that service, as well as the Big Picture value proposition. – Ben

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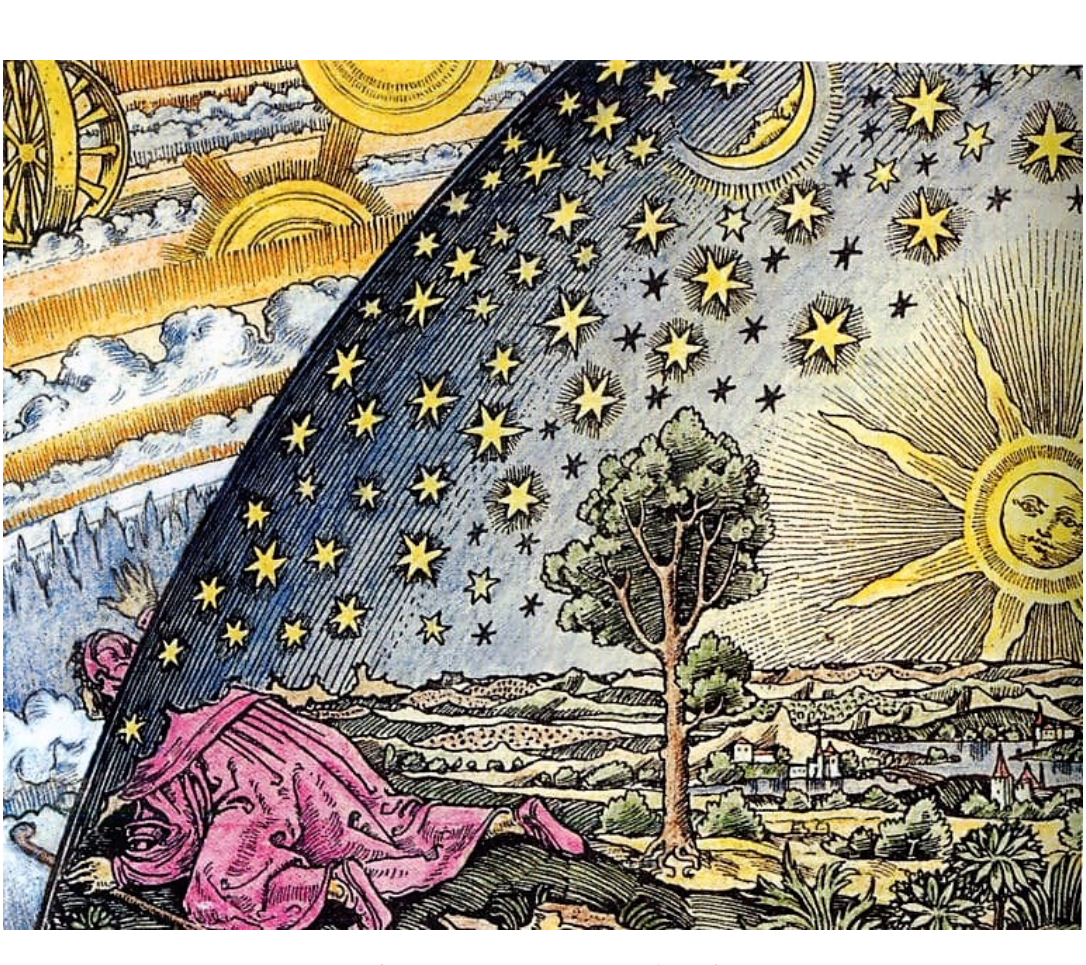


Flammarion engraving (1888)

We're all explorers seeking to pierce the veil, hoping against hope for a vision of the music of the spheres beyond this messy world. Looking for an Answer in the clockwork machine that we all believe incorporates and underpins markets.

I think we're doing it wrong.

I think investment professionals, quant and non-quant alike, are misusing the massive computing power that each and every one of us has at our fingertips. Whether it's the powerful computer that we call a smartphone, whether it's the crazy powerful multi-threaded computer that we call a laptop, whether it's the insanely powerful computing utility we call AWS or Azure or the like … we're using machine computing processes as an extension of our human computing processes.

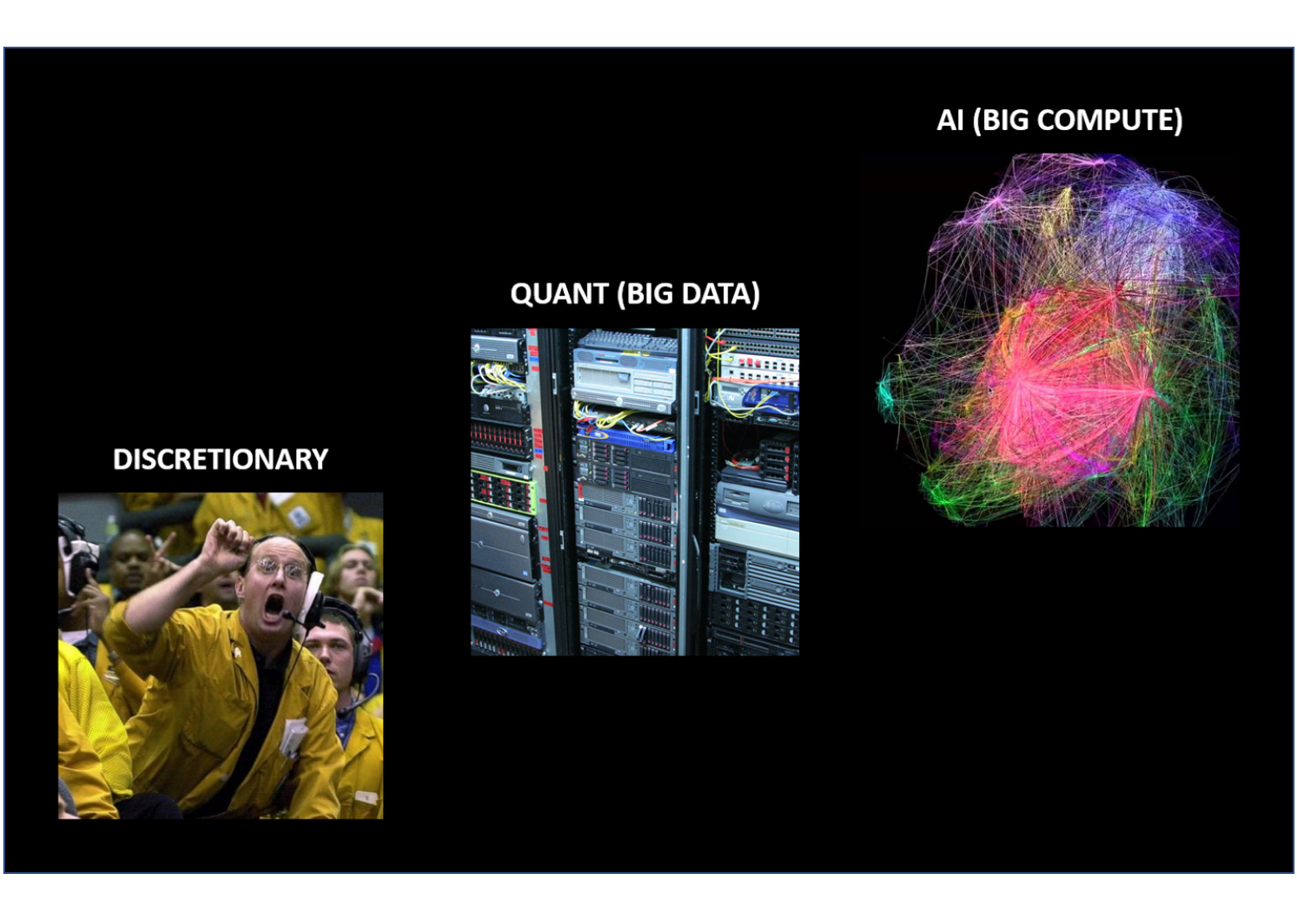
This is a classic anthropomorphic fallacy.

Meaning that we can't *imagine* what it would *mean* to use computers in some other, non-human way. Meaning that we never even consider whether there's a human way of perceiving the world, much less what a non-human approach might be.

Here, I'll give you an example.

In every how-do-we-use-computers-in-investing conversation I've ever had with anyone in tech … in every how-do-we-use-computers-in-investing conversation I've ever had with anyone in finance … in every how-do-we-use-computers-in-investing conversation I've ever had with MYSELF … *the conversation, either implicitly or explicitly, is ALWAYS about using computers to find some hidden formula that will make us lots of money.*

Always. Without exception. Ever.



This is a slide that ET contributor Neville Crawley made a while back, and it slays in meetings. It resonates. It sings.

Oh yeah, I see why we want this artificial intelligence system (I mean, I don't know why you're calling it Big Compute, but whatever).

It's the next level. It's the Giant Brain, replacing the Big Brain of all those computers that DE Shaw and Two Sigma and RenTech are using to figure out markets and mint money, which replaced the Little Brain of us humans scurrying around in the pits. AI is going to pierce through all the *noise* and find us the *signal*. It's going to identify the *pattern*. It's going to tell us the *Answer*.

Do you feel it? I feel it. It's why I became a professional investor in the first place. To figure it out. To find those patterns and signals that would make me rich. To find the "tell" of markets.

But that's not how AI works. That's not how any of this works.

AI is not a giant brain, and there is no Answer to be found.

AI isn't even a Difference Engine, as Charles Babbage called his programmable analytic device that we now call a computer. It's more like a Connection Engine, able to "see" the similarities in a million-fold matrix all at once. It's a non-human intelligence, more like an insect's compound eye + nervous system than anything human-ish. And yes, there's an oldie but goodie Epsilon Theory note for that.

As for the Answer …

The absence of an Answer – by which I mean the non-existence of a general closed-end solution or a predictive algorithm in any physical system of three or more interactive entities and certainly in any social system – is at the core of two canonical Epsilon Theory notes: **The Three-Body Problem** and **Clear Eyes, Full Hearts, Can't Lose**. Honestly it's the heart of the entire **Things Fall Apart** series of ET notes.

This message – *that there is no predictive algorithm for social systems* – bears repeating over and over, because the human brain is hard-wired to seek that algorithm. We literally cannot help ourselves. I believe it's the root of every totalitarian impulse, large and small, that the human animal has ever experienced. That totalitarian impulse is most obvious – and most deadly – in our social system of politics, but it is no less present in our social system of markets.

We think of markets as a clockwork machine, as an intricate collection of gears upon gears. We believe that if only we examine the clockwork closely enough, we can identify some hidden gear or unbeknownst gear movement that will let us predict the clockwork's movement and make a lot of money.

Our MODEL of markets is The Machine, and every Machine has a deterministic set of algorithms that create and drive it. Every Machine has an Answer.

This model – the market as machine – is an anthropomorphism.

There are lots of historical and anthropomorphic reasons why we think of social systems as machines. But they are all historical and anthropomorphic reasons. There's nothing "natural" about it. And yes, there's an Epsilon Theory note on that, too.

I'm sorry, Ray Dalio, but as a philosopher you're a fantastic hedge fund manager.

To be clear, market-as-machine is a perfectly useful anthropomorphic model for most investment purposes, just as Ptolemy's Earth-centric universe was a perfectly useful anthropomorphic model for most navigational purposes. Seriously, if your goal is to sail your ship from Tyre to Ostia, then you can't do better than celestial navigation per Ptolemy. If you want to go to the moon, on the other hand …

Anthropomorphic models break when a revolutionary invention allows us to SEE the world in a non-human way.

For the Ptolemaic earth-as-center-of-the-universe model, that revolutionary invention was the telescope and the ability to see sunspots and Jupiter's moons and all sorts of astronomical objects and phenomena that were, literally, previously invisible to the HUMAN eye.

AI is the revolutionary invention that breaks the market-as-machine model. It allows us to SEE narrative and sentiment and all sorts of social objects and phenomena that were, literally, previously invisible to the HUMAN eye.

To be sure, this new invention that lets us see in non-human ways isn't a sufficient condition to break an anthropomorphic model. These models become so embedded in our social institutions and our minds that, as with Ptolemaic science and the invention of the telescope, it can take a hundred years and a lot of violence for a better model to be widely accepted.

And that's the problem with AI for most investors, quant and non-quant alike.

If you use computers in your investment research process – and I know you do – I will bet you umpteen zillion dollars that you have those computers looking at structured historical data in an effort to find some repeating pattern. I will bet you do this rigorously and intentionally if you're a quant. I will bet that you do this all the same, but non-rigorously and haphazardly if you're not a quant.

Whether you realize it or not, you are using the market-as-machine model. You are looking for the Answer. Go on, you can admit it. You're among friends here. I'm like Big Lou in the insurance ads … I'm one of you. It is embedded in our minds and in our businesses. Mine, too.

But here's the thing.

> If you use AI as just another input to that market-as-machine investment research process, you will get puzzling "results" that don't help you very much. It will be just like using a telescope to get better measurements of the retrograde motion of Mars as it orbits around the Earth in your Ptolemaic model.
>
> **You will be disappointed by AI.**

I want to suggest a different way to think about markets, a non-anthropomorphic model that works WITH the revolutionary invention of AI and Big Compute.

The market is not a clockwork machine.

The market is a bonfire.

We all know the physics of fire. The underlying rules of combustion are as clear and as deterministic as any pendulum or gear movement. Fire is not magic. Fire is not somehow separate from science or rigorous human examination. We know how to start fires. We know how to grow and diminish fires. We know how to put fires out. In a technical sense, Ray, you can classify fire as a machine.

But you'd never think that you could possess an algorithm that predicts the shape and form of a bonfire.

You'd never think that if only you stared at the fire long enough, and god knows humans have been staring at fires for tens of thousands of years, that somehow you'd divine some *formula* for predicting the shape of this or that lick of flame or the timing of this or that log collapsing in a burst of sparks.

No human can algorithmically PREDICT how a fire will burn. Neither can a computer. No matter how much computing power you throw at a bonfire, a general closed-end solution for a macro system like this simply does not exist.

But a really powerful computer can CALCULATE how a fire will burn. A really powerful computer can SIMULATE how a fire will burn. Not by looking for historical patterns in fire. Not by running econometric regressions. Not by figuring out the "secret formula" that "explains" a macro phenomenon like a bonfire. That's the human way of seeing the world, and if you use your computing power to do more of that, you are wasting your time and your money. No, a really powerful computer can perceive the world differently. It can "see" every tiny piece of wood and every tiny volume of oxygen and every tiny erg of energy. It "knows" the rules for how wood and oxygen and heat interact. Most importantly – and most differently from humans – this really powerful computer can "see" all of these tiny pieces and "know" all of these tiny interactions *at the same time*. It can take a snapshot of ALL of this at time T and calculate what ALL of this looks like at time T+1, and then do that calculation again to figure out what ALL of this looks like at time T+2.

Want to guess who spends more money on Big Compute than everyone else in the world combined?

It's the U.S. government, through the Dept. of Defense and the Dept. of Energy.

Know why they've spent BILLIONS of dollars on the world's most advanced supercomputers?

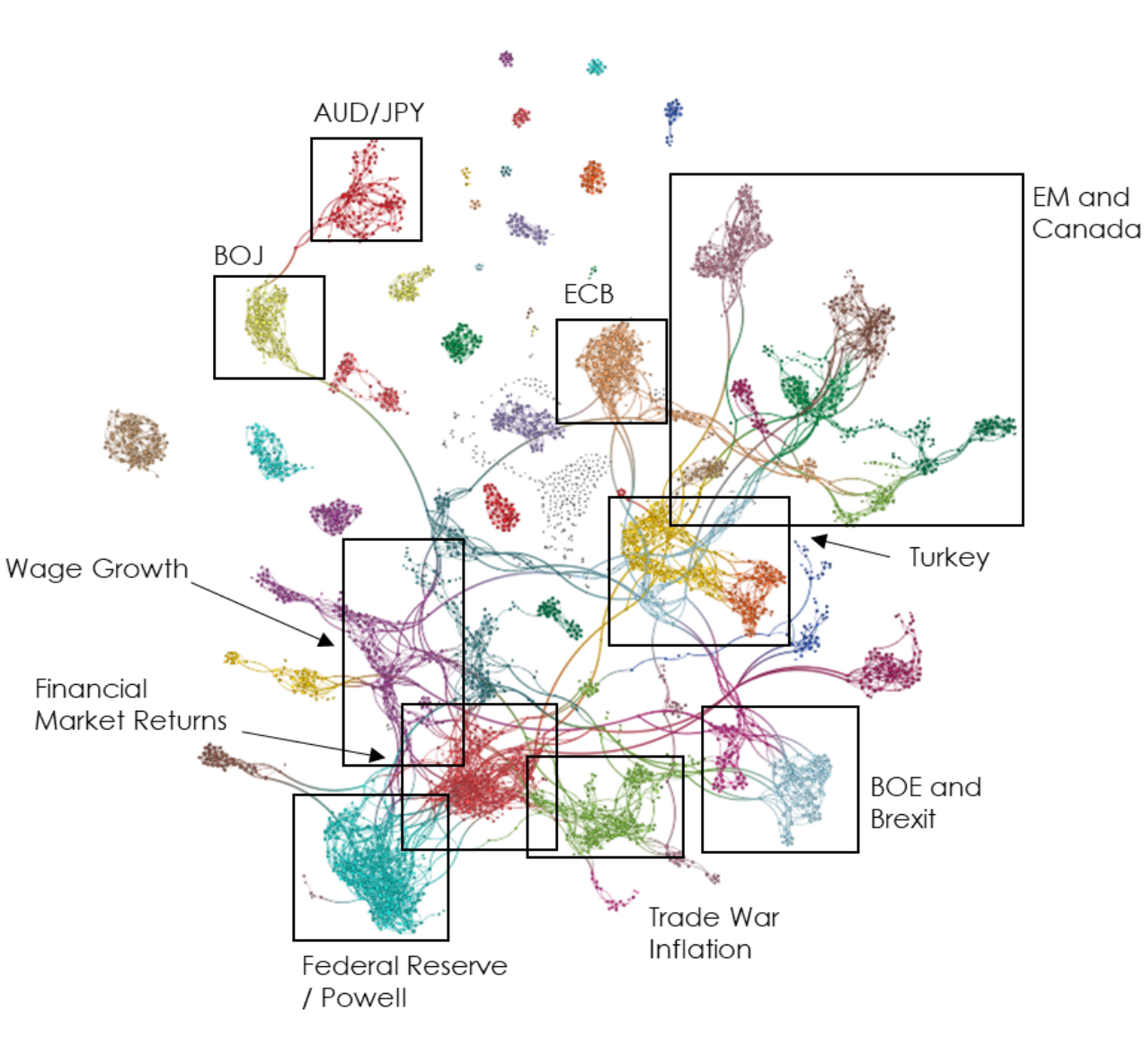
To calculate fire.

Not just any old fire, of course, but nuclear fire. This is why the most advanced computers in the world today have been built – to *simulate* the explosion of nuclear weapons. To see the future by *calculating* the future, not by analyzing the past for predictive algorithms.

It's a hard concept to wrap your head around, this distinction between *calculating* the future and *predicting* the future, but it's the key to thinking about your investment research process in a non-anthropomorphic way. It's the key to successfully and profitably incorporating the revolutionary invention of AI and Big Compute into your investment research process.

Now let's be really clear … we're a loooong way from performing the market equivalent of simulating H-Bomb explosions with the Narrative Machine. No, we're more at the stage of taking a rudimentary telescope and aiming it at the sky. We have neither the ability to "see" market participants at a molecular level nor the ability to "know" the physical interaction rules of these participants at anywhere near the same precision or "resolution" that the DoD can see or know nuclear reactions.

But when we show you a Narrative map of Inflation like this, that's the path we're on.



We're taking ALL of the thousands of financial media articles published over some period of time that mention "inflation", and comparing every word and every phrase in every article to every other word and every other phrase in every other article. It's a million-fold matrix that "sees" these publications and their inchoate arguments all at the same time and measures their connectedness and similarities all at the same time, then visualizes that connectedness in dimensions that make sense to a human eye and mind – color, distance, size, position, etc.

We can't give you a secret formula for predicting markets from looking at narrative-space.

But we can tell you what IS in narrative-space.

What good is that?

- We think we know some of the "rules" for *calculating* what's NEXT in market participant behaviors from what IS in narrative-space. This is the Common Knowledge Game, and it's a *forward-looking, actor-based* way of evaluating the *path* of markets.
- More importantly, we think that YOU already know many of the "rules" for calculating what's next in whatever corner of the market is important to you. We think that experienced discretionary investors, traders, allocators and advisors have an *enormous* amount of internalized knowledge about the relationship between narrative-space and market participants in *their* arena of expertise. We think that a visualization of narrative-space can weaponize your internalized knowledge.

Tapping directly into the Narrative Machine is not for everyone.

If you're looking for a new variable for your regression analysis, you don't want this. If you're looking for a new data feed that you can analyze and arb, you don't want this. If you're running a purely systematic or passive investment strategy, you don't want this.

But if any aspect of your investing or your portfolio allocation is still human … if any aspect of your investing or your portfolio allocation is still discretionary … we think you'll find the Narrative Machine research project worth a look.

Not because we can give you an Answer.

But because we can advance your Process.

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Mike

"Want to guess who spends more money on Big Compute than everyone else in the world combined? It's the U.S. government, through the Dept. of Defense and the Dept. of Energy."

Tapping directly into the Narrative Machine is not for everyone…It will be an interesting journey, but narrative is imbedded in the world of digital exhaust, if you want to see where DoD tactics are going in the digital world and how that might cross pollinate, then look below! Narrative is a way, but cutting through the noise will only get louder and more complex.

DARPA leaders are calling this "mosaic warfare."

Modern-day weapons to pieces in a jigsaw puzzle. Each piece of the puzzle is exquisite. It can only fit one way into the picture, and if one loses a piece, then the picture is incomplete.

A tile in a mosaic is one small part of a bigger picture. "If you lose one tile, not a big deal," he said. In this metaphor, a tile equals an individual weapon.

Part of the concept is "combining weapons we already have today in new and surprising ways," Grayson said. Key will be manned-unmanned teaming, disaggregating capabilities, and allowing commanders to seamlessly call on effects from sea, land or air depending on the situation and no matter which of the armed services is providing the capability.

An example in the air domain might include a series of drones to accompany a typical battle formation of four fighter aircraft. One of the robotic wingmen might be there solely to jam radars or employ other electronic warfare capabilities. Another might have a weapon payload. The third might have a sensor package and the fourth could act as a decoy, Burns said in an article distributed at the conference.

Instead of four blips on the radar, the enemy sees eight, and he has no idea what capabilities each of them delivers.

"The adversary can't predict what we will do next,"

In another example, a Special Operations A-team behind enemy lines spots a previously unknown surface-to-air missile site. It radios in its location and the command-and-control system automatically searches for the best means to destroy the target. It could be a nearby Army brigade, a submarine or a patrolling fighter aircraft. The command is sent and the best platform for the job is called in for a strike.

Mosaic warfare is similar to other warfighting buzzwords currently being bandied about such as systems-of-systems or joint multi-domain operations.

As for current Army leaders, they also call their new doctrine "multi-domain operations."

The goal is "to disrupt, penetrate, disintegrate and exploit the enemy's anti-access systems and bring their fielded forces to operational paralysis."

Think about that out loud…ponder on the capabilities coming. It's not simpler, its more complex! It's swarming, its networks, its ideas, get you mind-melding caps on!

Extra Note:

The Secretary Problem is a form of the Optimum Stopping problem, where you're not sure when you should stop searching for an optimum form of something. You could keep searching and maybe find something better, but that might be a waste of time you should be spending on something else. There is an actual answer: which is 37%. Optimum Stopping is about avoiding stopping too early or too late. If you follow this optimal strategy you will also have a 37% chance of finding the best thing.

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20 hours ago

Landvermesser

Thanks for this note, Ben, it's really illuminating.

I think the "Doing it wrong" problem you identify in finance is very similar to a "Doing it wrong" problem I see in the broader AI field today. Instead of your dichotomy of "predict vs. calculate/simulate" I use "fit vs. model", but I think they are more or less the same thing.

A lot of mainstream AI today is about taking a set of possible inputs, each one associated with a desired output, and coming up with a function that does the best possible job doing the desired association. A grad student looking to get published will take a bunch of pictures of dogs, each one labeled "dog", a bunch of trucks labeled "truck", etc. and try to end up with a neural network that takes a new picture of a dog and calls it "dog". Somebody trying to find an edge in a market might take a set of training examples, each one consisting of the price history of the week leading up to day T, each one associated with the return that occurred on day T+1. This person wants to be able, at some time in the future, to take the returns of the last week and predict what will happen tomorrow. Either way, they're FITting a relationship between inputs and outputs, which is a very different thing from MODELing the real-world system that happened to produce that relationship in the first place. The line can be blurry and there are subtleties, but I think this is a meaningful axis along which to distinguish certain things.

When your narrative is "fitting", the system you produce is going to see inputs that it didn't see during training. You like to think it will just (LOL!) interpolate but the reality is that you're almost always having to extrapolate along at least one dimension. And to do a really good job of that without any huge, embarrassing failures (google "adversarial examples") you need so many training examples it's not even funny. You'll never, ever, ever have enough. And you'll never be sure that your curation of training data isn't introducing a subtle bias that causes no problems during training, no problems during the first year of use, and then a catastrophic collapse in performance on day 366 because some little thing (that nobody could have guessed would be relevant) changed in the input stream.

I think there's hope. GAN's seem to have huge potential, I just wish somebody would get them working for something more interesting than generating headshots of imaginary celebrities.

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12 hours ago

Mark Kahn

I learned early on, when I started, back in the '80s, that there is no Answer to the markets – certainly not one anyone could find – but I could "feel" something in the market – when sentiment was shifting or a market "story" was dead, for example – and combined with a rigorous application of almost-trite trading and investing rules (that many spout but few sincerely and consistently follow) have made a reasonably successful career out of trading and investing, despite never getting anywhere near an Answer.

Over all these years, never believing there was an Answer out there helped keep me humble and saved me a lot of time, but as Ben pointed out in "American Bandstand," it can be rational to act as if you believe a bit (even if you don't) because it is part of the common knowledge. Thoughtful arm-length believing – and letting others think you believe – can help your trading and investing and is, IMO, the only way, at times, to keep your career and credibility afloat (sad, but true).

I kind of recognized the common knowledge game, but never fully understood it – but "felt" it enough to use it in my investing. Ditto, "inflection points," "when the story fails," and so many other smart ET ideas and approaches that I didn't even know I was leveraging in my trading and investing.

It wasn't until 2013, when I read Ben's ET manifesto, that I realized I'd been nibbling at the edges of an important investment approach / vision. Since then, I've be free-riding on Ben and Rusty (and am now paying the silly low price of $20 a month) as they've been educating me to the advanced field of game theory, behavioral science and population dynamics that I had a tenuous grip on and amorphous understanding of prior to ET.

Now the "stuff" that I had been intuiting into my trading and investment strategies – sentiment shifts, market emotion, risk-on/risk-off, "bang" moments, dead stories, etc. – was being explained in an academic and philosophical framework. It has made my use of these tools meaningfully more effective in the same way that the early discoverers of electricity had stumbled around (some believing it to be magic) versus today's fully scientific approach to electricity's uses.

This statement: "It's a hard concept to wrap your head around, this distinction between calculating the future and predicting the future, but it's the key to thinking about your investment research process in a non-anthropomorphic way" is a brilliant one that will take our ET pack another step along the journey, not to the mythical Answer, but to a much better understanding of the markets.

Do others feel like this: Ben and Rusty didn't convert me to a new philosophy, but showed me that my inchoate thoughts and somewhat haphazard process – which always felt different than the dominant Answer-seeker's approach to markets – actually were not random ideas and efforts, but part of a rigorous and structured philosophy that was only now being built out and applied – by Ben and Rusty – to a market framework?

Plus, "the market is a bonfire" is a really cool thought.

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6 hours ago

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