

THROUGH THE LOOKING-GLASS



U/CON101SMD

THROUGH THE LOOKING GLASS:



"If you don't know where you're going, any road will get you there"
Cheshire Cat

WARNING:
AN APES GUIDE TO THE GALAXY
Ignorance is bliss

**For those of you who wish to continue:
Every path walked is the same path followed.**

“Oh, how I wish I could shut up like a telescope! I think I could, if only I knew how to begin.” For, you see, so many out-of-the-way things had happened lately, that Alice had begun to think that very few things indeed were really impossible. —Chapter 1, Down the Rabbit-Hole

CLASSIFICATION LEVEL: APE

**NOTE:
ALL INFORMATION PROVIDED IN THIS
DOCUMENTATION IS OPEN SOURCE**

.....and through the looking glass we shall go....

Preface

Chapter 1: Common Denominators

Chapter 2: Start as you mean to go on...ISO 20022

Chapter 3: An apes intro: QUANTUM COMPUTING

Chapter 4: HFT (High Frequency Trading)

Chapter 5: TENET

PREFACE:

I am only a humble ape.

I am not a financial adviser.

I do not provide any financial advice below.

Many thoughts here are my opinion, and others can be speculative. I run both a crypto portfolio and a stocks and shares portfolio. At this moment in time however I only hodl one position and that is GME.

I decided to question why this is the only position I chose to hodl when it came to my portfolio overall;

If you have not read The Long Con I implore you to read it:

👁️ https://www.reddit.com/r/Superstonk/comments/o5pq2u/tlc_the_long_con_the_markets_are_frothing_with/ 👁️

Pdf & mobile edition:

https://docs.google.com/document/d/1fdZV5B6RtyVurxcVsXAOtWNn5NE8BZS1TPu24ZAzLkl/edit#heading=h.ev332bx_acuxp TLC:THE LONG CON



Buckle up

Collaboration with u/Hey_Madie

Various parts of Madie's previous DD data support the potential use of Quantum annealing. The discovery of ALGO trade patterns is one of the patterns found in her Parabolic Theory.

She has added her knowledge of physics to explain the connection between Quantum computing and the Schrödinger equation. She is my Quant.



CHAPTER 1:

COMMON DENOMINATORS:

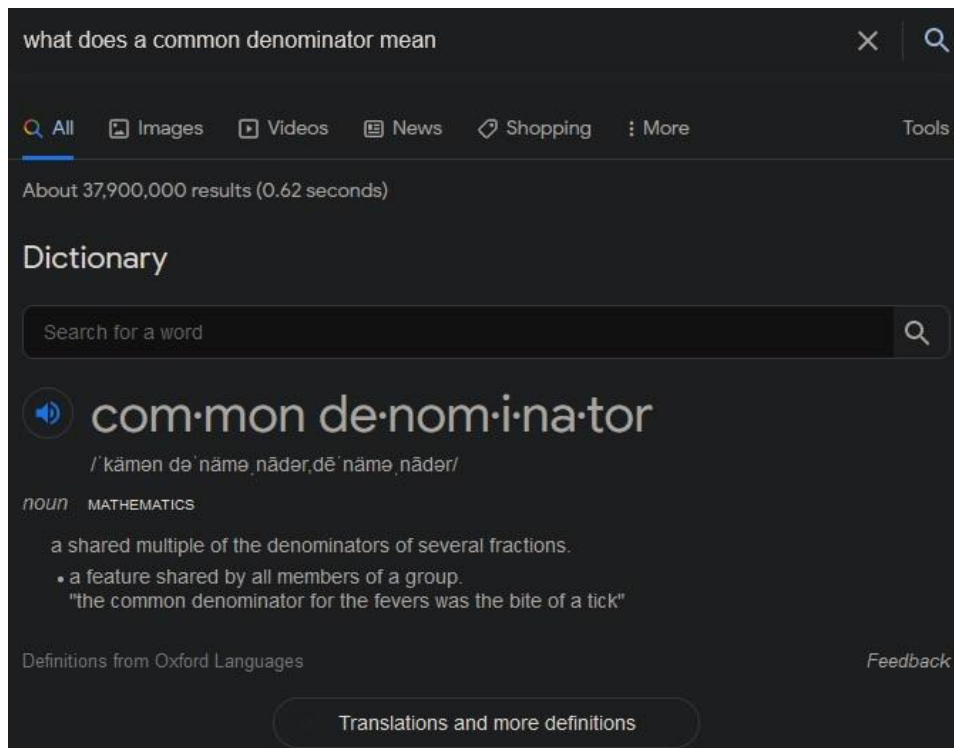
Lets run the fastest 0-100 of your life, you will need to get used to that GeForce that you'll be experiencing shortly. (sorrynotsorry)

What is a common denominator?

<https://www.merriam-webster.com/dictionary/common%20denominator>

- mathematics : a number that can be divided by each of the denominators of a group of fractions
- something (such as a feature or quality) that is shared by all the members of a group of people or things

Common denominators; in ape terms: Interesting similarities



what does a common denominator mean

Q All Images Videos News Shopping More Tools

About 37,900,000 results (0.62 seconds)

Dictionary

Search for a word

com·mon de·nom·i·na·tor
/ˈkɑːmən dəˈnɑːməˌnɑːdəɹ, dəˈnɑːməˌnɑːdəɹ/

noun MATHEMATICS

a shared multiple of the denominators of several fractions.

- a feature shared by all members of a group.
"the common denominator for the fevers was the bite of a tick"

Definitions from Oxford Languages [Feedback](#)

Translations and more definitions

Ok so that was a nice gentle break into a new Due-Diligence. We're on track!

We will be launching shortly so in final preparations I would like you to check that your seatbelts are secure, seats are forward and that you fasten your tray table securely into its upright position.

I ask that you buckle up as your cerebral capacity is about to be tested to its limits as we embark on our first test run, consider it a synthetic flight if you will!

You are about to receive important information regarding your financial investment if you are a shareholder....(I was going to say '...a shareholder of GME' however it goes much deeper I'm afraid, it is market wide)

Do not fear for I have traversed through the darkness and made it through to the other side, I have a torch and will guide you through the path I found in: **AN APES GUIDE TO THE GALAXY**
.....

CHAPTER 2:

Start as you mean to go on.....**SWIFT**

In **TLC: THE LONG CON** it touched briefly upon HFT (high frequency trading), arbitrage, and their uses in the crypto currency markets and global stock markets.

<https://www.investopedia.com/terms/h/high-frequency-trading.asp>

The thought of having a machine that could essentially endlessly scalp profit fascinated me. In my previous set of posts I also touched upon my own interests in passive incomes:

- **PoW** (Proof of Work) mining,
- **PoS** (Proof of stake) 'staking' & ofc the infamous by now
- **LP token creation** (that led to synthetic assets).

So to me, the thought of having a machine that can work passively, constantly, 24/7, generating a consistent, long term, high yielding, low costing, automated return, well that just sounded fantastic.

To me it felt like a **golden goose**



<https://www.forbes.com/sites/lanceiot/2021/06/23/internal-whistleblowers-might-just-blow-the-li-d-off-some-quite-dicey-ai-self-driving-cars/?sh=513a64163d62>

Firstly,

From having processed many IMTs (International Money Transfer) during my time in banking, SWIFT is something that becomes firmly ingrained in daily office life so when a news headline pops up in your feed of course you have a look. I think it would be beneficial to touch upon & explain to you now so that when they do become relevant you will be 'as chilled as a frozen banana'.

(It's a legit localism, many who have journeyed there have touched the stars, for me though, it seems, it was only for practice)

Blockchain technologies solve many fundamental problems that we all face in today's world, One of those problems is good old fashioned banking.

Take for example If you go to your local branch and ask to make an IMT (International money transfer) then it could take up to 12 working days to get to its final destination and incurs multiple conversion and handling fees.

Crypto currencies fundamentally cut out the middle man processes which normally are what cost the consumer in the end being where the buck stops.

IMTs (International Money Transfers) are processed through an international network called SWIFT which currently can be slow & expensive with currency conversions & handling fees.

First let's check out SWIFT:

Global banks preparing to leverage SWIFT's new platform for international payments flows

PAYMENTS, 24 JUNE 2021 | 5 MIN READ



<https://www.swift.com/>

SWIFT is the way the world moves value. Done every single instant of every single day, right across the world. No other organisation can address the scale, precision, pace and trust that this demands.

“SWIFT is unique & established to find a better way for the global financial community to move value – a reliable, safe and secure approach that the community can trust, completely. We have constantly evolved in an ever-changing landscape, without undermining that trust. Nearly five decades on, our vibrant community reflects the complexity and diversity of the financial ecosystem.

Today, goods and services move more quickly and across greater distances than ever before, so value needs to move further and faster too. Our vision is for a world in which payments are not only trusted but instant. We innovate tirelessly, test exhaustively, then implement fast. In a connected and challenging era, our approach has never been more relevant. There’s no other organisation like us anywhere in the world. Without us the world would be a very different place. We’re trusted every instant.

SWIFT’s messaging services are trusted and used by more than 11,000 financial institutions in more than 200 countries and territories around the world. Providing reliable, secure and efficient messaging services to our community of users, SWIFT is the backbone of global financial communication.

Our messaging services went live in 1977 to replace the Telex technology then widely used by banks to communicate instructions related to cross-border transfers. The service remains as relevant today as it was ground-breaking back then, representing the primary communications channel for financial institutions engaged in correspondent banking all around the world, and offering the most secure, cost-effective and reliable way of transmitting financial messages relating to payments, securities, treasury and trade.”

Essentially, it is to do with international money transfers (IMTs) and the structure of how they are set up. The system in use is simply out of date technology compared to what is needed for modern banking without even considering the banking needs of the future. Think moving from mail to email, they are just digitizing and standardizing the infrastructure to make flow of transactions easier. As SWIFT mentioned themselves their systems are still running on the back of 1970s technology. (Think Apple Pay Vs a cheque.)

(IMT: <https://www.moneysavingexpert.com/banking/foreign-currency-exchange/>)

So that leads me onto ISO 2022: The Network Upgrade.

WHAT IS ISO 2022?



First, I apologize if this has already been covered in the sub, I haven't seen any talk about it so;

When it comes to spending your moon money in the future, this will help you instantly cross convert trade in any currency, with a LOT more fluidity and ease.

"In the coming years, banks globally will migrate from legacy SWIFT MT financial messaging to the highly structured and data-rich ISO 20022 standard. The flexible framework provides an internationally agreed business message syntax and semantics.

Syntax & semantics: <https://builtin.com/data-science/introduction-nlp>

User communities and message developers will use the same message structure, form, and meaning to relay financial transaction information worldwide. Open Banking, Real-Time Gross Settlement (RTGS) system renewal, and Instant Payments have propelled the payments industry forward in recent years. All of these developments affect financial institutions and require resources and investments to implement. The migration to the new systems and standards such as ISO 20022, in particular, will have a profound impact on banks, corporations, and anyone with a stake in the payments business.

Financial institutions can leverage ISO 20022's increased interoperability to increase efficiency while reducing costs and exposure to risk.

The benefits of ISO 20022 come with a price: each and every character in a financial message has to be 100% correct and aligned with the specifications.

(note: how eWallets can lose all)

Even a single missing colon could result in a multi-million transfer being rejected or delayed for days.”

From my own past experiences an IMT (International money transfer) from Europe to say Australia could take as long as 12 working days. A cheque sent in the post legit would arrive sooner.

The new standard enables more efficient management of Nostro reconciliation, exception handling, billing reporting, and AML (anti money laundering) checks once financial institutions adapt and improve their infrastructure to handle larger volumes of ISO 20022 payments data at a faster rate.

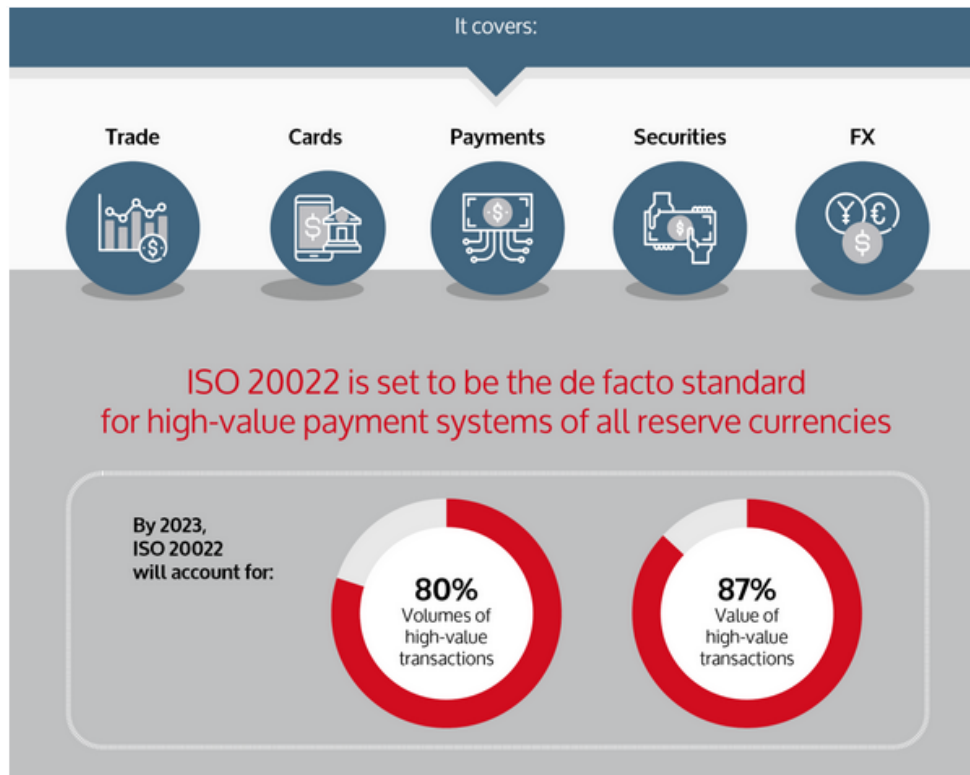
To capture these opportunities, industry players need to make sure that their clients and employees have a thorough understanding of the new standard through education, management, and monitoring.

High-Value Payments Systems (HVPS) worldwide have already migrated to ISO 20022 to capture these benefits, including those in Japan, Switzerland, and China. Other countries are on track to adopt the new common standard in the coming years. However, as many international financial institutions reallocate resources to deal with the global COVID-19 pandemic's more immediate consequences, SWIFT decided to delay its migration to ISO 20022 by one year to November 2022. ****See below****

Nostro Reconciliation: <https://www.investopedia.com/terms/n/nostroaccount.asp>

AML: https://en.wikipedia.org/wiki/Money_laundering
<https://www.investopedia.com/terms/a/aml.asp>

Swift delay: <https://internationalbanker.com/banking/iso-20022-changes-en-route/>



ISO 2022 was due to be implemented on November 2021 however delayed plans until November 2022 due to the outbreak of COVID

Although ISO 2022 has certainly been identified as the common international standard for financial messaging, the implementation remains uncertain. As the world recovers from the pandemic and migration efforts continue, financial institutions will need to dedicate time and resources over a sustained period to gain knowledge and expertise for a successful migration to ISO 2022.

This in a nutshell has been your introduction to SWIFT & ISO 2022. It will become relevant later on.

****Very cool little tidbit that I reckon you all will think is gonna ROCK!****

<https://www.coindesk.com/japan-to-have-blockchain-based-stock-exchange-in-2022>

THROUGH THE LOOKING GLASS WE GO:

When I was doing my due-diligence I came across an interesting little update.

Although ISO 20022 has certainly been identified as the common international standard for financial messaging, the implementation remains uncertain. As the world recovers from the pandemic and migration efforts continue, financial institutions will need to dedicate time and resources over a sustained period to gain knowledge and expertise for a successful migration to ISO 20022.

The complexity of implementing ISO 20022 is a significant challenge that offers the opportunity for financial institutions to re-evaluate their business models and prepare their infrastructure for the digital future of payments.

SDK.finance: Automated Reconciliation Service built on the ISO 20022

<https://sdk.finance/#what-sdk>

There were a few interesting things I noticed that made think about my last DD

Check this:

Use cases.

- Neobank**
Build neobanking products and launch them with ready-made software at a much lower cost.
- E-wallet**
Ready-to-go solution for EMLs and PIs (including AISPs and PISPs). Create a product like Paypal®, Alipay®, or PayTM®.
- Accept online payments**
A complete stack for all your online payments acceptance business. Requires an integration with payment gateways.
- Accept in-store payments**
Accept payments in an offline store. Run a POS (point of sale) business or offer QR payments for your merchants.
- Money remittance**
Help migrants transfer money abroad like Transferwise® does. Currency exchange is a part of the product.
- Currency exchange**
Build your online currency exchange business. Set up custom commission rates.

Just wait til you meet Eric. He can be a bit *ominous* im ngl

Anyways, on my way back to researching AR (Automated Reconciliation) I did a quick google search to see what info I could find for dates but interestingly I hit this little nugget:

sweeping impact on crypto markets. subscribe to valid points here.

Pulse check: ETH held in smart contracts rises

Since January, the amount of ether (ETH) held in smart contracts has increased over 50% to an all-time high of 26.7 million ETH, worth roughly \$50 billion. Meanwhile, the amount of ETH held on cryptocurrency exchanges fell to a two-year low of 13 million ETH.

As background, smart contracts are accounts on Ethereum that are controlled by self-executing code as opposed to a user. These accounts can be engineered to trigger transactions according to a set of predefined rules and conditions. As of June 2021, close to one quarter of total ETH supply is held and managed by smart contract accounts.

The most popular smart contracts on Ethereum, according to analysis by [Anthony Sassano](#), co-founder of the “EthHub” podcast, are finance-focused and enable users to earn attractive yields on their ETH. Of the 26 million ETH held in smart contracts, roughly 8.5 million is used within decentralized finance (DeFi) apps such as MakerDAO, Aave, Compound and Uniswap.

After DeFi apps, the Ethereum 2.0 deposit contract, which is the smart contract that creates validators on the Eth 2.0 Beacon Chain, is the second-most popular by total value locked, holding around 5.8 million ETH.

Increasing value in these smart contracts suggests the use case for ether as a speculative asset to trade on exchanges is growing weaker while the asset’s narrative as an interest-bearing crypto asset to be used within the decentralized application (dapp) ecosystem of Ethereum is taking off.

“It’s all about what the ETH is actually being used for and if the utility of Ethereum is driving demand for more ETH. I believe that it clearly is,” Sassano wrote in his newsletter, [The Daily Gwei](#).

<https://www.nasdaq.com/articles/valid-points%3A-why-eip-1559-matters-to-eth-2.0-validators-2021-06-23>

Well shit, I think we just found out where a lot of excess money from that short selling has been getting moved to... Ethereum stakings up 50% this year and that is dated JUNE 23RD!

Aren't Ethereum 2.0 stakings locked in inaccessible at the minute though? Something reminds me Eth 2.0 is coming in 2023 with the roll out of EIP 1559

ETH 2.0: Ethereum's 'EIP 1559' Fee Market Overhaul Greenlit for July

"A large majority of Ethereum miners are against the proposal. But that hasn't stopped developers from scheduling the upgrade for July.

One of the most significant and contentious alterations to the Ethereum blockchain in recent memory is now scheduled for inclusion into its codebase.

Ethereum Improvement Proposal ([EIP 1559](#)) will be packaged with the London hard fork this coming July regardless of the mining industry's discontent with the proposal, according to the All Core Developers [call](#) Friday. At least five other EIPs are likely to join EIP 1559 in [London](#).

The proposal has garnered some of the largest support to date from Ethereum application creators and users alike, given the current difficulty of selecting a correct transaction fee. Miners and mining pools, on the other hand, have been gathering in opposition [against](#) the proposal as it progressed toward mainnet."

<https://www.coindesk.com/ethereum-improvement-proposal-1559-london-hard-fork>

Good place to lock away some excess money when you know ethereum and the use of its ERC20 network are the future post a market crash (IMO)

ANYWAYS, I digress; I was on a roll there!

Let's continue:

What is automatic reconciliation?

Bank reconciliation is an accounting process that enables you to check whether the information held in your accounting records matches up with the information in your bank account. Automatic reconciliation, also referred to as automatic bank reconciliation, allows you to automate this process. It enables you to cut down on the time, cost, and potential for errors associated with manual bank reconciliation and can help to reduce your business's overall financial risk.

Ok now over on SDK.finance, I noticed this:



'cLicKety Click'

Oh for the love of god here we go again.....

What is the difference between machine learning and deep learning?

Artificial intelligence, machine learning, neural networks, and deep learning are often misleadingly used interchangeably in media, creating ambiguity about them. When, in fact, they are essentially subsets or progressions of each prior term. As such, deep learning is a subset of machine learning, and both are subfields of artificial intelligence.

https://sdk.finance/machine-learning-deep-learning-forecasting-for-banking-industry/#How_do_banks_use_machine_learning_and_deep_learning_for_forecasting_and_prediction

Led to:

How do banks use machine learning and deep learning for forecasting and prediction?

Credit risk forecasting for banking using deep learning takes minutes and eliminates human errors that can create unnecessary problems down the line. The same algorithm applies to investment risks as well so that banks can evaluate their assets to make better financial decisions. SDK.finance understands how important risk management is for financial companies. To help banks optimize their risk exposure and maximize revenue, SDK.finance offers a risk management feature.

With accurate revenue forecasts, banks can plan investments and expenditures accordingly. If a branch or division is underperforming, machine learning can help to identify the cause and ways to correct it quickly. Planning infrastructure needs based on future forecasts can prevent unexpected downtimes and additional expenses. SDK.finance leverages machine learning to help companies break down the neverending raw data stream into actionable insights about their business performance.

<https://sdk.finance/machine-learning-deep-learning-forecasting-for-banking-industry/>

Although deep learning and machine learning function in a similar fashion, their capabilities are different. Machine learning models can become progressively better with iterations, but humans must correct inaccurate predictions generated by the algorithms. On the other hand, a deep learning model can determine whether its predictions are accurate or not on its own.

As sourced from: **NVIDIA**

<https://blogs.nvidia.com/blog/2016/07/29/whats-difference-artificial-intelligence-machine-learning-deep-learning-ai/>

Although deep learning and machine learning function in a similar fashion, their capabilities are different. Machine learning models can become progressively better with iterations, but humans must correct inaccurate predictions generated by the algorithms. On the other hand, a deep learning model can determine whether its predictions are accurate or not on its own.

For example, a machine learning algorithm can be taught to spot a suspicious transaction and flag it as fraudulent by feeding it a usually structured dataset to learn from. It depends on human intervention to determine the differences between data inputs and their characteristics, such as time, date, amount, and location of a transaction. As it continues to learn, it will flag any transaction when it spots certain suspicious behaviors it recognizes.

Now, a deep learning model automates much of the fraudulent behavior extraction process, eliminating some of the required human input. As deep learning models have multiple neural networks, large unstructured datasets can be processed more efficiently and faster than with a machine learning algorithm. This is an important point because unstructured data comprises 80-90% of data found in companies worldwide, according to IBM.

Besides preventing fraud, machine learning and deep learning enable banks to improve user experience, optimize services, automate processes, and predict customer churn. Leading financial institutions are already employing data science tools that help them drive sales and revenue.

<https://sdk.finance/how-does-data-science-help-to-drive-sales-and-revenue/>

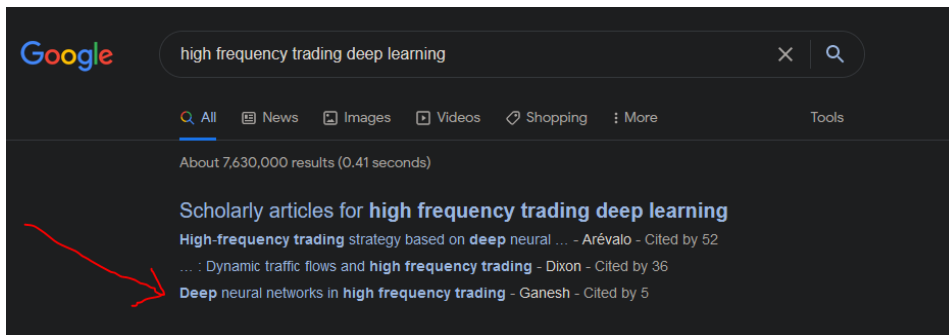
Now if I were running into a problem of a stock I had planned to bankrupt & all of a sudden all these apes suddenly started buying just one stock, I wonder how a new deep learning AI with *computational constraints* may react to that kind of situation Bahahahah! What if it simply isn't capable yet of finding a solution to the fucked up state that a stock like, oh let's say, GME is in?



OHH FUCK! THIS SUDDENLY LOOKS A BIT JUICY: GeForce go BRrrRrrRRRrrrrr bigly right now.

LET'S DIVE DEEP INTO THE UPPER ECHELONS OF HIGH FREQUENCY TRADING:

Someone that is able to do this must have hyper algos & connections.



Google gave me this gem, and I mean it is a **DIAMOND**, it ain't long but damn it was an eye opener.

VLSTM: VERY LONG SHORT-TERM MEMORY NETWORKS FOR HIGH-FREQUENCY TRADING

<https://arxiv.org/pdf/1809.01506.pdf>

2.2. Mean Reversion

Mean reversion is a financial theory which suggests that the price of a stock tends to return towards its long running mean price over time [7] and such a behavior is seen in most of the stock markets across the world [8]. Trading on this strategy is done by noticing companies whose stock values have significantly moved away in some direction from its long running mean and thus is now expected to move in the opposite direction. Using mean reversion in stock price prediction involves both identifying the trading range for a stock (short-term information) and the evolution of the mean around which the prices will be oscillating (long-term information).

2.3. Related Work

The success of deep learning models has penetrated a lot of fields, including finance. However its reach in HFT is limited [9], primarily due to the computational constraints and primitive problem modeling methods. While there has been some work done on the algorithmic side [10], most of the work has been focused on feature engineering in HFT [6, 11, 12, 13, 14], with simpler models like linear regression, multiple kernel learning, maximum margin etc. [6, 15]

Long short-term memory networks (LSTMs) [4] are one of the most commonly used deep learning models for time-series analysis. Multiple variations of LSTM have been proposed over time which deal with the multi-context and long sequence length problems. For example, Hierarchical LSTMs

It isn't a long document but damn did it explain a lot to me. It pretty much summarizes all the ladder attacks we've seen, the **flat OBV**, so much fuckery that we are witnessing.

keywords - Google : *Computational Constraints*

What's a Computational Constraint?

One possible answer to the question in the title is simple: anything that narrows down a computation is a computational constraint. It might however trivialize the issue because everything begins to look like a computational constraint, for we know since the work of Bennett (1973) that all computations including the classical Turing computations are reversible; since Feynman (1982) that all reversible physical processes may be computable, which is to say quantum mechanics—hence the whole natural world—is computable; and since Deutsch (1985) that **quantum computations** satisfy his Church-Turing Principle: all finitely realizable physical systems can be perfectly made computational by finite means.

Ok so lets recap:

HFT needs a lot of computer power, like unfathomable ungodly amounts of computer power, with current computers not being fast enough being a hedgie I do what I do best:

And so if im a hedgie I Look outside the box: *How can I get more computational computer power?*

Quantum computers ofc.....duh!

<https://www.youtube.com/watch?v=qg1BXDit3LQ>

Bergson and the Holographic Theory of Mind

1



Steve Robbins, PhD

IBM unveils the world's first quantum computer that businesses can actually use to solve previously impossible problems:

<https://www.businessinsider.com.au/ibm-unveils-ibm-q-system-one-the-first-commercial-quantum-computer-2019-1?r=US&IR=T>

- IBM unveiled the IBM Q System One on Tuesday, billed as the world's first quantum computer that businesses will be able to buy and use.
 - Previously, quantum computers have been confined to research labs – Microsoft, Google, IBM, and lots of others have been racing to bring a viable quantum computer to market.
 - Now IBM will partner with commercial clients to give them access to this technology, which will allow businesses to model complicated data, such as investments and risk.
 - Quantum computers have the potential to perform seemingly impossible computing tasks, but they're still in their very early stages.
 - The computer itself is in a 9-foot-tall, 9-foot-wide glass cube that maintains the exact correct temperature and other conditions it needs to do its work – a kind of fragility that means that you can't just order one and have it delivered; customers will access it via the IBM Cloud.
-

For many years, quantum computers have been within only the confines of the research lab.

CHAPTER 3:

AN APES INTRODUCTION TO QUANTUM COMPUTING:

People talk about getting sucked into YouTube planning to watch one video clip only to be stuck on cat videos after 10 hours of unproductivity yaaa. I get sucked into Wiki that way, and I love to see commonalities and related articles end up cross-referencing each other. Sad ikr....

Why Schrödinger's cat can be applied.

If it weren't possible for quantum objects to be in two states at once, the computer you're using to read this couldn't exist. Superposition is the quantum phenomenon of Superposition and is a consequence of the dual particle and wave nature of everything. For an object to have a wavelength, it must extend over some region of space, which means it occupies many positions simultaneously. The wavelength of an object is limited to a small area of space that can't be perfectly defined. So it exists in many different wavelengths at the same time. We don't see these wave properties for everyday objects because the wavelength decreases as the momentum increases. Let's apply that to high-frequency trading.

Superposition - <https://www.merriam-webster.com/dictionary/superposition>

How is my stonk mixed up in this physics stuff?

Quantum Computing

Even if experiments cannot yet tackle the measurement problem fully, they have much to contribute to a very hot field: quantum computing. A classical computer is built of transistors that switch between 0 or 1. In a quantum computer, however, the "transistors" remain in a superposition of 0 *and* 1 (called a quantum bit, or qubit); calculations proceed via interactions between superposed states until a measurement is performed. Then the superpositions collapse, and the machine delivers a final result. In theory, because it could process many possible answers simultaneously, a quantum computer would accomplish in seconds tasks, such as factoring large numbers to break codes, that would take years for a classical machine.

Source: <https://www.scientificamerican.com/article/bringing-schrodingers-quantum-cat-to-life/>

Schrödinger appearance

The **Schrödinger equation** is a linear partial differential equation that governs the wave function of a quantum-mechanical system. It is a key result in quantum mechanics, and its discovery was a significant landmark in the development of the subject. The equation is named after Erwin Schrödinger, who postulated the equation in 1925, and published it in 1926, forming the basis for the work that resulted in his Nobel Prize in Physics in 1933.

Schrodinger Equation

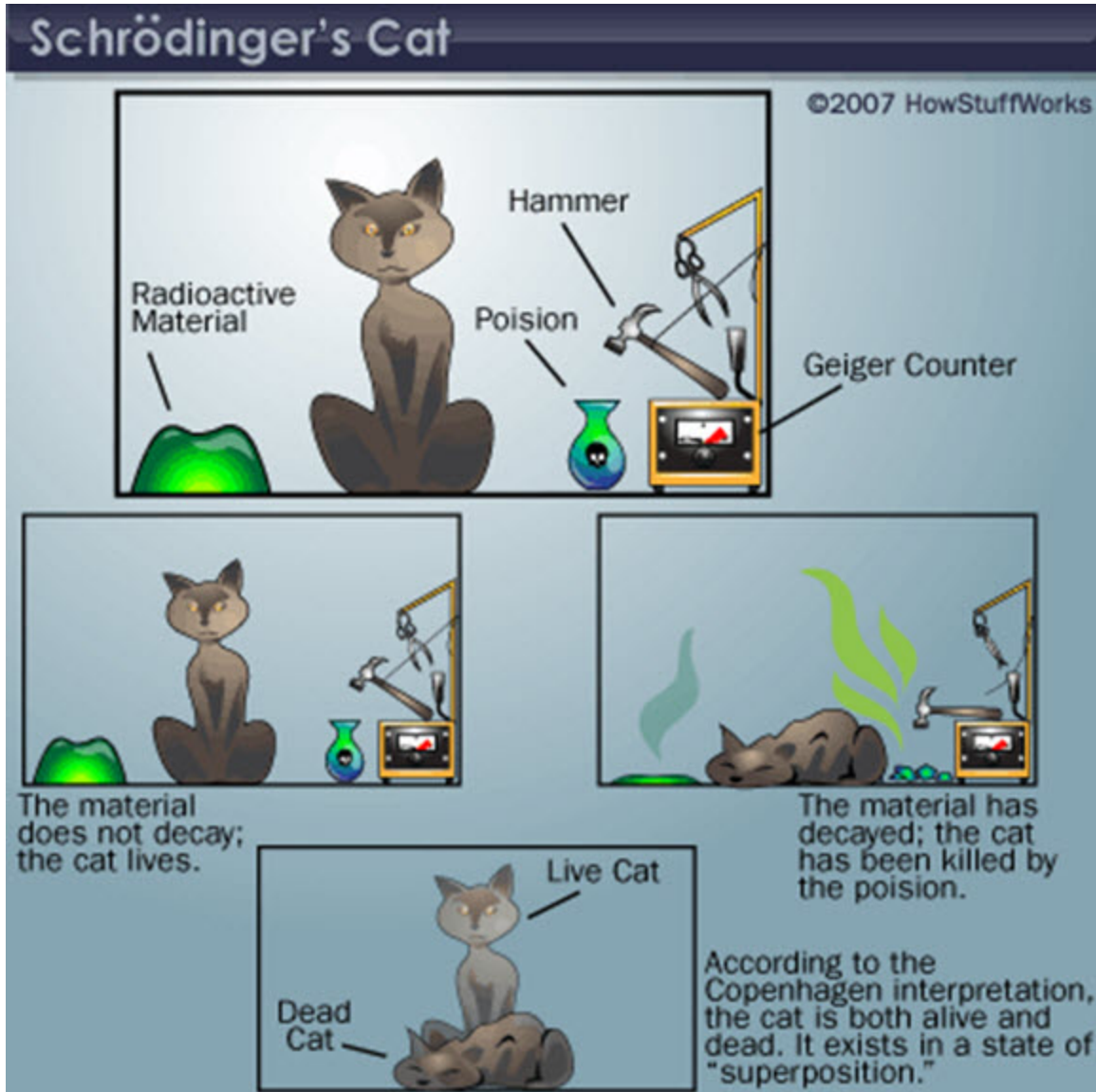
The Schrodinger equation plays the role of Newton's laws and conservation of energy in classical mechanics - i.e., it predicts the future behavior of a dynamic system. It is a wave equation in terms of the wavefunction which predicts analytically and precisely the probability of events or outcome. The detailed outcome is not strictly determined, but given a large number of events, the Schrodinger equation will predict the distribution of results.

And so one of many revelations in the GameStop saga:

The **Schrödinger equation** is a linear partial differential **equation** that governs the wave function of a quantum-mechanical system. The **Schrödinger equation** gives the evolution over time of a wave function, the quantum-mechanical characterization of an isolated physical system. ...

The internet is deep and filled with information, be safe in the knowledge that I am guiding you through one of many paths I have already traveled down, do not fear, for once we have completed our journey through **AN APES INTRODUCTION TO QUANTUM COMPUTING**, you will earn the right to alumni status from the University of SuperStonk.

And so my humble apes, one of life's great mysteries you shall receive the answer to today: This is why.....



.....I AM NOT A CAT >Meow< ;P

Bell's theorem shows that no theory that satisfies the conditions imposed **can** reproduce the probabilistic predictions of quantum mechanics under all circumstances. The principal condition used to derive **Bell** inequalities is a condition that may be called **Bell** locality, or factorizability.

<https://youtu.be/ISdBAf-ysl0?t=3003> Bell's Theorem.

https://en.wikipedia.org/wiki/Bell%27s_theorem

First we have to look at the mechanics necessary for highly sophisticated HFTs to work, and so we begin at the start;

The screenshot shows the Wikipedia article for "Quantum computing". At the top, there is a navigation bar with "Article" and "Talk" tabs, and a search box. Below the title, there is a red banner stating: "This article's tone or style may not reflect the encyclopedic tone used on Wikipedia. See Wikipedia's guide to writing better articles for suggestions (November 2019) (Learn how and when to remove this template message)". The main text begins with: "Quantum computing is the exploitation of collective properties of quantum states, such as superposition and entanglement, to perform computation. The devices that perform quantum computations are known as quantum computers. They are believed to be able to solve certain computational problems, such as integer factorization (which underlies RSA encryption), substantially faster than classical computers. The study of quantum computing is a subfield of quantum information science. Expansion is expected in the next few years as the field shifts toward real-world use in pharmaceutical, data security and other applications." A yellow highlight is present on the first sentence. A red circle highlights the phrase "quantum annealing" in the text. A table of contents is visible at the bottom of the article snippet, listing sections like "1 Quantum circuit", "1.1 Definition", "1.2 Quantum algorithms", and "2 Potential applications".

https://en.wikipedia.org/wiki/Quantum_computing

Note: Eric is another trusty friend of mine, he fills in when Hank finds a wombo combo or two. *(omg was that just a double double entendre)*

Inception I swear,
Eric says hi btw

These are alien to you, I don't need to cover any of the details that I read. I'll save you from brain hurt but I did want to make this connection to you. It will become relevant shortly

Having travelled down a spider web of Quantum Computing Wikipedia pages I wanted to circle specifically back around to one that kept crawling back into my search:

- **Quantum annealing**

There's some actual interesting stuff here for an ape to read into if they like their theoreticals lol. Apart from how bloody relevant it all is right now, it is interesting, unless it's just an ape nerd thing.

Quantum annealing starts from a quantum-mechanical superposition of all possible states (candidate states) with equal weights. Then the system evolves following the time-dependent Schrödinger equation, a natural quantum-mechanical evolution of physical systems. The amplitudes of all candidate states keep changing, realizing a quantum parallelism, according to the time-dependent strength of the transverse field, which causes quantum tunneling between states. If the rate of change of the transverse field is slow enough, the system stays close to the ground state of the instantaneous Hamiltonian (also see adiabatic quantum computation).^[6] If the rate of change of the transverse field is accelerated, the system may leave the ground state temporarily but produce a higher likelihood of concluding in the ground state of the final problem Hamiltonian, i.e., diabatic quantum computation.^{[7][8]} The transverse field is finally switched off, and the system is expected to have reached the ground state of the classical Ising model that corresponds to the solution to the original optimization problem. An experimental demonstration of the success of quantum annealing for random magnets was reported immediately after the initial theoretical proposal'

https://en.wikipedia.org/wiki/Schr%C3%B6dinger_equation

https://en.wikipedia.org/wiki/Ising_model

The screenshot shows the Wikipedia article for "Quantum annealing". The page is in English and is currently being viewed by a user who is not logged in. The article text is as follows:

Quantum annealing (QA) is a metaheuristic for finding the global minimum of a given objective function over a given set of candidate solutions (candidate states), by a process using quantum fluctuations (in other words, a meta-procedure for finding a procedure that finds an absolute minimum size/length/cost/distance from within a possibly very large, but nonetheless finite set of possible solutions using quantum fluctuation-based computation instead of classical computation). Quantum annealing is used mainly for problems where the search space is discrete (combinatorial optimization problems) with many local minima, such as finding the ground state of a spin glass^[1] or the traveling salesman problem. Quantum annealing was first proposed in 1988 by B. Apolloni, N. Cesa Bianchi and D. De Falco.^{[2][3]} It was formulated in its present form by T. Kadowaki and H. Nishimori (ja) in "Quantum annealing in the transverse Ising model"^[4] though a proposal in a different form had been made by A. B. Finnila, M. A. Gomez, C. Sebenik and J. D. Doll, in "Quantum annealing: A new method for minimizing multidimensional functions"^[5]

Quantum annealing starts from a quantum-mechanical superposition of all possible states (candidate states) with equal weights. Then the system evolves following the time-dependent Schrödinger equation, a natural quantum-mechanical evolution of physical systems. The amplitudes of all candidate states keep changing, realizing a quantum parallelism, according to the time-dependent strength of the transverse field, which causes quantum tunneling between states. If the rate of change of the transverse field is slow enough, the system stays close to the ground state of the instantaneous Hamiltonian (also see adiabatic quantum computation)^[6] if the rate of change of the transverse field is accelerated, the system may leave the ground state temporarily but produce a higher likelihood of concluding in the ground state of the final problem Hamiltonian, i.e., diabatic quantum computation.^{[7][8]} The transverse field is finally switched off, and the system is expected to have reached the ground state of the classical Ising model that corresponds to the solution to the original optimization problem. An experimental demonstration of the success of quantum annealing for random magnets was reported immediately after the initial theoretical proposal.^[9]

Contents [hide]

- Comparison to simulated annealing
- Quantum mechanics: analogy and advantage
- D-Wave implementations
- References
- Further reading

Comparison to simulated annealing [edit]

Quantum annealing can be compared to simulated annealing, whose "temperature" parameter plays a similar role to QA's tunneling field strength. In simulated annealing, the temperature determines the probability of moving to a state of higher "energy" from a single current state. In quantum annealing, the strength of transverse field determines the quantum-mechanical probability to change the amplitudes of all states in parallel. Analytical^[10] and numerical^[11] evidence suggests that quantum annealing outperforms simulated annealing under certain conditions (see^[12] for a careful analysis).

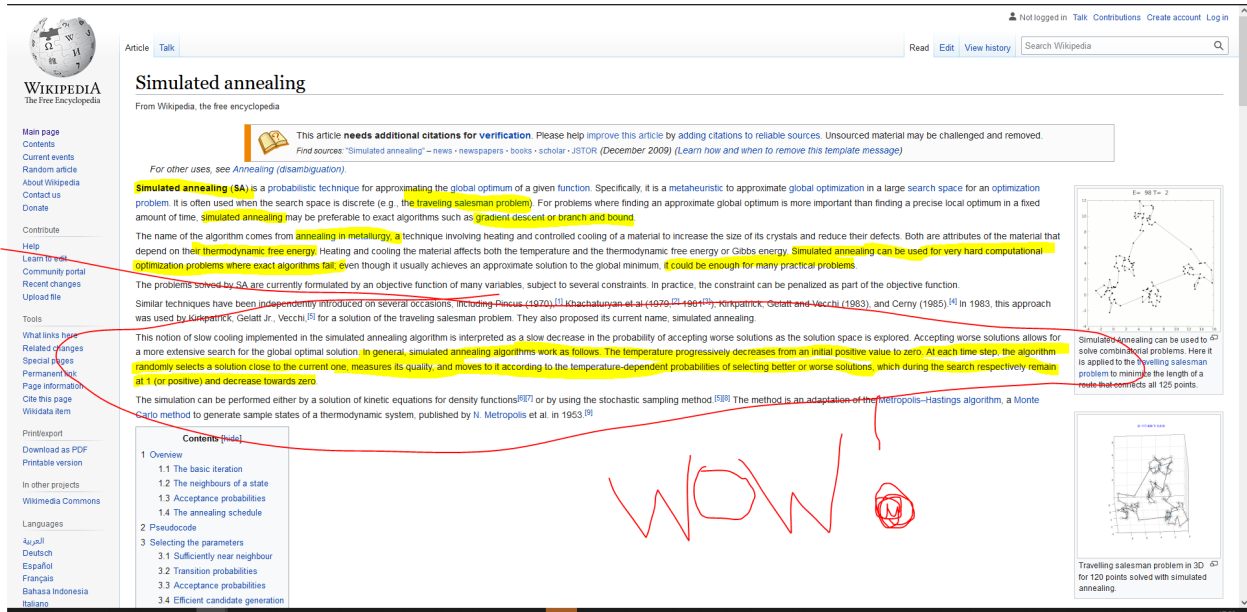
Quantum mechanics: analogy and advantage [edit]

The tunneling field is basically a kinetic energy term that does not commute with the classical potential energy part of the original glass. The whole process can be simulated in a computer using quantum Monte Carlo (or other stochastic technique), and thus obtain a heuristic algorithm for finding the ground state of the classical glass.

In the case of annealing a purely mathematical objective function, one may consider the variables in the problem to be classical degrees of freedom, and the cost functions to be the potential energy function (classical Hamiltonian). Then a suitable term consisting of non-commuting variable(s) (i.e. variables that have non-zero commutator with the variables of the original mathematical problem) has to be introduced artificially in the Hamiltonian to play the role of the tunneling field (kinetic part). Then one may carry out the simulation with the quantum Hamiltonian thus constructed (the original function + non-commuting part) just as described above. Here, there is a choice in selecting the non-commuting term and the efficiency of annealing may depend on that.

The diagram shows a potential energy landscape with two wells. A red arrow labeled "Thermal Jump" points from a higher energy state in the left well to a higher energy state in the right well. A blue arrow labeled "Quantum Tunneling" points from the ground state in the left well to the ground state in the right well.

Quantum annealing is used mainly for problems where the search space is discrete (combinatorial optimization problems) with many local minima, such as finding the ground state of a spin glass or the traveling salesman problem.



https://en.wikipedia.org/wiki/Simulated_annealing

This notion of slow cooling implemented in the **simulated annealing algorithm** is interpreted as a slow decrease in the probability of accepting worse solutions as the solution space is explored. Accepting worse solutions allows for a more extensive search for the optimal global solution. In general, simulated annealing algorithms work as follows. The temperature **progressively decreases from an initial positive value to zero**. **At each time step**, the algorithm **randomly selects a solution close to the current one**, measures its quality, and **moves** to it according to the temperature-dependent probabilities of selecting better or worse solutions, which during the search respectively remain at 1 (or positive) **and decrease towards zero**.

HOLY FUCK! THAT SOUNDS LIKE OUR SHORT SELLING PROBLEM ON GAMESTOP?!?!?!?!?

Nothing is a coincidence,

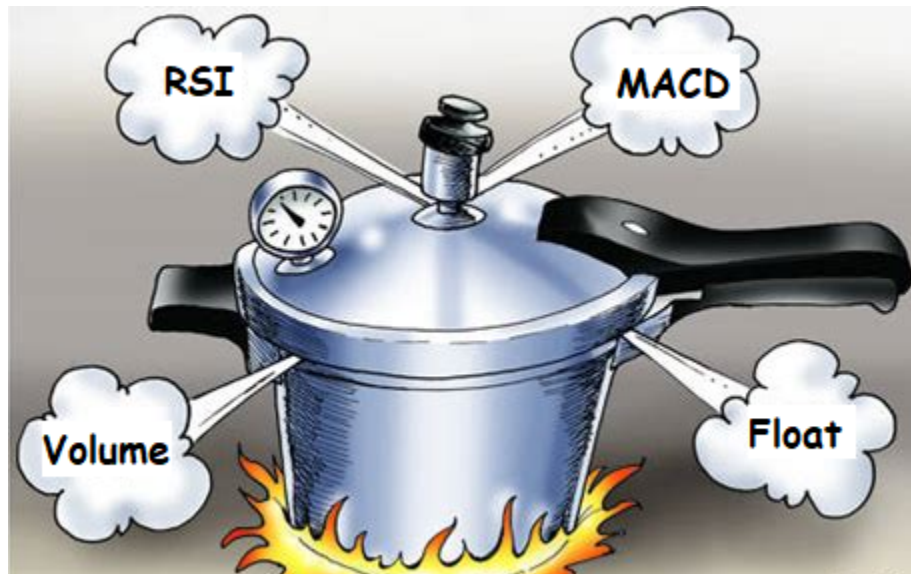
*****cough**T+21**cough*** 🗨️🗨️

HOLY FUCK THE CORRELATIONS: THE MEME STOCKS: THE CRYPTO: EVERYTHING

Seeing it plain as day it dawned on me of a previous compilation of posts I had read before on Superstonk. 'The penny Drops'..... I implore you to read them.

Source: [u/Hey_Madie](#)

GME is a Rocket/Pressure Cooker - Quant Analysis of RSI and Parabolic Activity - Momentum Indicators



* All these patterns and data points will be validated when hedge fund data is made more public in the future. I foresee the correlations between the DD's we know of today and connections to specific patterns connected to Algo trading patterns. I think much of what we see is the patterns starting to become more obvious.*

Have you read my Parabolic Theory?

https://www.reddit.com/r/Superstonk/comments/o2gfvr/gme_is_a_rocketpressure_cooker_quant_analysis_of/ 👁👁

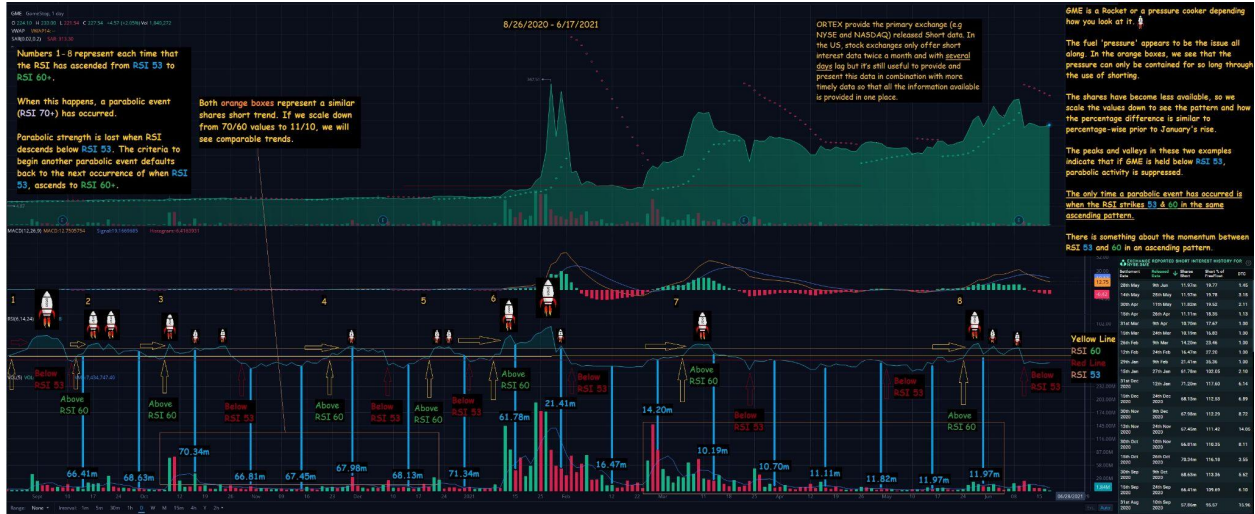
The image tracking of correlation:

<https://preview.redd.it/d2wkjnrviw571.png?width=3140&format=png&auto=webp&s=29721d3aaf783fec2c2ceabe6345b0b167f6ecfd> My applied quantitative analysis found the median of RSI 53 being the probable factor for all positive price action. 👁👁👁👁

[r/Superstonk - GME is a Rocket/Pressure Cooker - Quant Analysis of ...](#) 👁👁👁👁

"The Visual Indicator

Parabolic occurrences are represented using rockets. The size represents the strength of the parabolic event. RSI 53 ascending to RSI 60 = Parabolic Event”

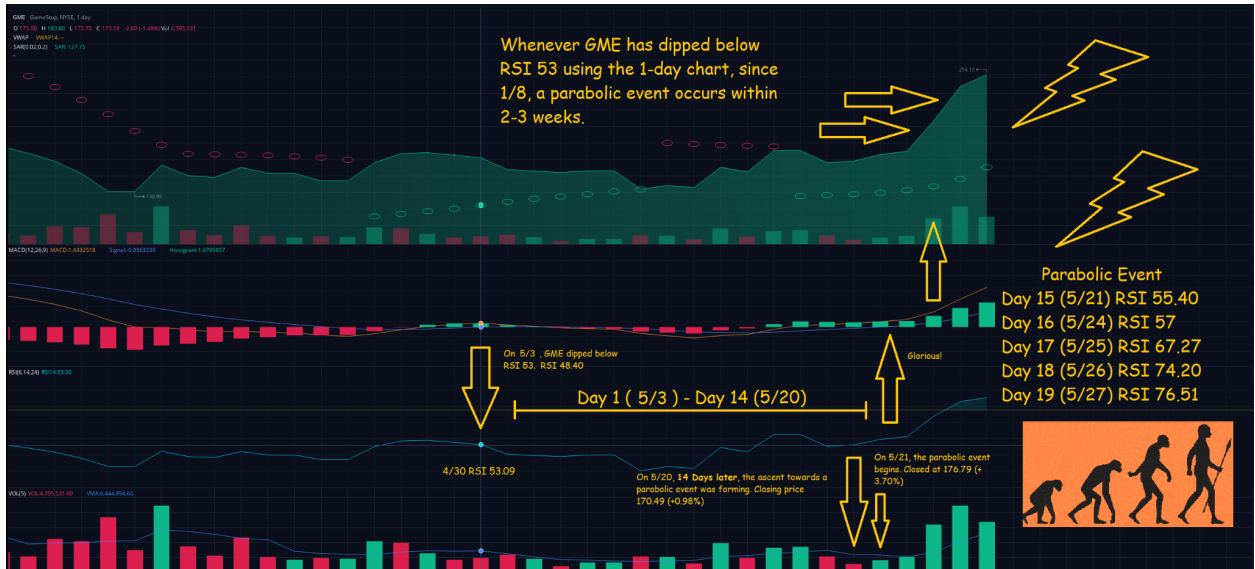


I would recommend opening the charts in a new tab. The devil is in the details.

When you take a closer look at the data analytics they fit! What the

A Closer Look:

This chart began at 5/3 using the daily chart. Notice the daily RSI build and eventual outcome of a parabolic event (RSI 70+).



Parabolic Event Criteria

- Negate the first five trade days within a 21-day cycle.
- MACD must be in an ascending pattern.
- RSI must exceed 60.
- Volume must exceed 2x the value compared to the previous trade day.

Cycle

If the criteria is not met within 21 trade days, the cycle will end and will begin on the next occurrence of RSI dipping below 53.

History of this Theory

On 3/10, GME had peaked and reached a price of \$385.50. From that point, it had declined in price and overall strength. It finally dipped below RSI 53 on 3/23. The data that day was, RSI 53, Open \$197.50 High \$201.75 Close \$181.75 Volume 12,517,039.

GME is a Rocket or a pressure cooker depending how you look at it. 🚀

The fuel 'pressure' appears to be the issue all along. In the orange boxes, we see that the pressure can only be contained for so long through the use of shorting.

The shares have become less available, so we scale the values down to see the pattern and how the percentage difference is similar to percentage-wise prior to January's rise.

The peaks and valleys in these two examples indicate that if GME is held below RSI 53, parabolic activity is suppressed.

The only time a parabolic event has occurred is when the RSI strikes 53 & 60 in the same ascending pattern.

There is something about the momentum between RSI 53 and 60 in an ascending pattern.

I only ask that you start from the beginning of her research into **IMMINENT RSI 100+ PARABOLIC EVENT** running theory, it is **DIAMOND**

The Parabolic Theory:

https://www.reddit.com/r/Superstonk/comments/nn4a59/the_theory_on_gme_parabolic_activity/

The initial DD that detected ALGO trade patterns with:

https://www.reddit.com/r/Superstonk/comments/n02o5f/gme_working_theory_imminent_rsi_100_parabolic/

Quant, you say? Read up her input, its undervalued [u/Hey_Madie](#)

wHerE hAnK?

Having read the whole way through SIMULATED ANNEALING (so you don't have to) I noticed at the very foot of the page:

The screenshot shows the footer of a Wikipedia article. It includes a list of external links, a navigation bar with the text "Major subfields of optimization" circled in red, and a categories list. At the bottom, there is a notice about the page's last edit date (13 April 2021) and a Creative Commons license notice. Logos for Wikimedia and MediaWiki are also visible.

External links [edit]

- Simulated Annealing@ A Javascript app that allows you to experiment with simulated annealing. Source code included.
- "General Simulated Annealing Algorithm"@ An open-source MATLAB program for general simulated annealing exercises
- Self-Guided Lesson on Simulated Annealing A Wikiversity project.
- Google in superposition of using *not* using quantum computer@ Ars Technica discusses the possibility that the **D-Wave** computer being used by Google may, in fact, be an efficient simulated annealing co-processor.

V · T · E [show]

Categories: Metaheuristics | Optimization algorithms and methods | Monte Carlo methods

This page was last edited on 13 April 2021, at 05:09 (UTC).

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Ok so **QUANTUM ANNEALING** needed looked into again, ProPlus+ time methinks, by this point the wrinkles are starting to form, bare with me, it's worth it:

Now I have to admit, when I see an extensive paragraph jam packed with information into nearly an entire topic as a footnote on a Wiki page I normally do take notice, *jaqued le tits*; this time was no exception.....

Hmmmm, wrinkles crinkling, I headed back to the **ANNEALED HEALING** page back on the D-wave to quantum annealing on wiki

substantial information, must looky look again:

Hol' up so it seems that ANNEALING is SHORTS needing to return to MEAN or else they're just losing money & it's pointless?!?!?!?!

ya...

D-Wave implementations

Further information: [D-Wave Systems § Computer systems](#), and [D-Wave Two](#)

In 2011, **D-Wave Systems** announced the first commercial quantum annealer on the market by the name D-Wave One and published a paper in Nature on its performance.^[R1] The company claims this system uses a 128-qubit processor chipset.^[R2] On May 25, 2011, D-Wave announced that a **Lockheed Martin** corporation entered into an agreement to purchase a **D-Wave One** system.^[R3] On October 28, 2011, **USC's Information Sciences Institute** took delivery of Lockheed's D-Wave One.

In **May 2013** it was announced that a consortium of **Google**, **NASA Ames** and the non-profit **Universities Space Research Association** purchased an adiabatic quantum computer from D-Wave Systems with 512 qubits.^{[R4][R5]} An **extensive study of its performance as a quantum annealer**, compared to some classical annealing algorithms, **is already available**.^[R6]

In **June 2014**, **D-Wave** announced a new quantum applications ecosystem with computational finance firm **IQB Information Technologies** (IQBT) and cancer research group DNA-SEQ to focus on solving real-world problems with quantum hardware.^[R7] As the first company dedicated to producing software applications for commercially available quantum computers, IQBT's research and development arm has focused on **D-Wave's quantum annealing processors and has successfully demonstrated that these processors are suitable for solving real-world applications**.^[R8]

With demonstrations of entanglement published,^[R9] the question of whether or not the D-Wave machine can demonstrate quantum speedup over all classical computers remains unanswered. A study published in Science in June 2014 **described as "the most thorough and precise study that has been done on the performance of the D-Wave machine"**^[R10] and "the fairest comparison yet" attempted to define and measure quantum speedup. Several definitions were put forward as some may be unverifiable by empirical tests, while others, though falsified, would nonetheless allow for the existence of performance advantages. The study found that the D-Wave chip "produced no quantum speedup" and did not rule out the possibility in future tests.^[R11] The researchers, led by Matthias Troyer at the **Swiss Federal Institute of Technology**, found "no quantum speedup" across the entire range of their tests, and only inconclusive results when looking at subsets of the tests. Their work illustrated "the subtle nature of the quantum speedup question". Further work^[R12] has advanced understanding of these test metrics and their reliance on equilibrated systems, thereby missing any signatures of advantage due to quantum dynamics.

There are many open questions regarding quantum speedup. The ETH reference in the previous section is just for one class of benchmark problems. Potentially there may be other classes of problems where quantum speedup might occur. Researchers at Google, LANL, USC, Texas A&M, and D-Wave are working hard to find such problem classes.^[R13]

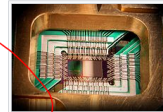
In December 2015, Google announced that the **D-Wave 2X** outperforms both simulated annealing and Quantum Monte Carlo by up to a factor of 100,000,000 on a set of hard optimization problems.^[R14]

D-Wave's architecture differs from traditional quantum computers. It is not known to be polynomially equivalent to a **universal quantum computer** and, in particular, cannot execute **Shor's algorithm** because Shor's algorithm is not a hillclimbing process. Shor's algorithm requires a universal quantum computer. D-Wave claims only to do quantum annealing.^[citation needed]

"A cross-disciplinary introduction to quantum annealing-based algorithms"^[R15] presents an introduction to combinatorial optimization (NP-hard) problems, the general structure of quantum annealing-based algorithms and two examples of this kind of algorithms for solving instances of the max-SAT and Minimum Multicut problems, together with an overview of the quantum annealing systems manufactured by D-Wave Systems. Hybrid quantum-classic algorithms for large-scale discrete-continuous optimization problems were reported to illustrate the quantum advantage.^[R16]

References

- ↑ Ray, P.; Chakrabarti, B. K.; Chakrabarti, A. (1989). "Sherngton-Kirkpatrick model in a transverse field: Absence of replica symmetry breaking due to quantum fluctuations". *Physical Review B*. **39** (16): 11828–11832. Bibcode:1989PhRvB..39i1828R. doi:10.1103/PhysRevB.39.11828. PMID 9948016.
- ↑ Brooke, J.; Bitko, D.; Rosenbaum, T. F.; Aeppli, G. (1999). "Quantum annealing of a disordered magnet". *Science*. **284** (5415): 779–81. arXiv:cond-mat/0105239. Bibcode:1999Sci...284..779B. doi:10.1126/science.284.5415.779. PMID 10221904. S2CID 37564720.
- ↑ B. K. Chakrabarti, "Critical behavior of the Ising spin-glass models in a transverse field", *Phys. Rev. B* **24**, 4062 (1981)
- ↑ W. Wu, B. Ellman, T. F. Rosenbaum, G. Aeppli, and D. H. Reich, "From classical to quantum glass", *Phys. Rev. Lett.* **67**, 2076 (1991)
- ↑ J. Brooke, D. Bitko, T. F. Rosenbaum, and G. Aeppli,
- ↑ T. Lanting, et al. (2014-05-29). "Entanglement in a quantum annealing processor". *Physical Review X*. **4** (2): 021041. arXiv:1401.3500. Bibcode:2014PhRvX...4b1041L. doi:10.1103/PhysRevX.4.021041. S2CID 19235104.
- ↑ Helmut Katzgraber, quoted in (Cho 2014).
- ↑ Cho, Adrian (20 June 2014). "Quantum or not, controversial".



Photograph of a chip constructed by D-Wave Systems, mounted and wire-bonded in a sample holder. The D-Wave One's processor is designed to use 128 superconducting logic elements that exhibit controllable and tunable coupling to perform operations.

D-Wave Systems

From Wikipedia, the free encyclopedia

D-Wave Systems Inc. is a Canadian quantum computing company, based in Burnaby, British Columbia, Canada. D-Wave was the world's first company to sell computers to exploit quantum effects in their operation.^[R] D-Wave's early customers include Lockheed Martin, University of Southern California, Google/NASA and Los Alamos National Lab.

In 2015, D-Wave's 2X Quantum Computer with more than 1,000 qubits was installed at the Quantum Artificial Intelligence Lab at NASA Ames Research Center. They have subsequently shipped systems with 2,048 qubits. In 2019, D-Wave announced a 5000 qubit system available mid-2020, using their new Pegasus chip with 15 connections per qubit.^[R1] D-Wave does not implement a generic quantum computer; instead, their computers implement specialized quantum annealing.

Contents

- History
- Computer systems
 - Onion prototype
 - 2009 Google demonstration
 - D-Wave One
 - Lockheed Martin and D-Wave collaboration
 - Optimization problem-solving in protein structure determination
 - D-Wave Two
 - D-Wave 2X and D-Wave 2000Q
 - Pegasus
- Comparison of D-Wave systems
- See also
- References
- External links

History

D-Wave was founded by Haig Farris (former chair of board), Geordie Rose (former CEO/CTO), Bob Wiens (former CFO), and Alexandre Zagoskin^[R2] (former VP Research and Chief Scientist). Farris taught a business course at the University of British Columbia (UBC), where Rose obtained his PhD, and Zagoskin was a postdoctoral fellow. The company name refers to their first qubit designs, which used d-wave superconductors.

D-Wave operated as an offshoot from UBC, while maintaining ties with the Department of Physics and Astronomy.^[R3] It funded academic research in quantum computing, thus building a collaborative network of research scientists. The company collaborated with several universities and institutions, including UBC, IPHT Jena, Université de Sherbrooke, University of Toronto, University of Twente, Chalmers University of Technology, University of Erlangen, and Jet Propulsion Laboratory. These partnerships were listed on D-Wave's website until 2005.^[R4] In June 2014, D-Wave announced a new quantum applications ecosystem with computational finance firm IQB Information Technologies (IQBT) and cancer research group DNA-SEQ to focus on solving real-world problems with quantum hardware.^[R5]

On May 11, 2011, D-Wave Systems announced **D-Wave One**, described as "the world's first commercially available quantum computer", operating on a 128-qubit chipset^[R6] using quantum annealing (a general method for finding the global minimum of a function by a process using quantum fluctuations)^{[R7][R8][R14]} to solve optimization problems. The D-Wave One was built on early prototypes such as D-Wave's Orion Quantum Computer. The prototype was a 16-qubit quantum annealing processor, demonstrated on February 13, 2007, at the Computer History Museum in Mountain View, California.^[R9] D-Wave demonstrated what they claimed to be a **28-qubit quantum annealing processor** on November 12, 2007.^[R10] The chip was fabricated at the NASA Jet Propulsion Laboratory Microdevices Lab in Pasadena, California.^[R11]

In **May 2013**, a collaboration between NASA, Google and the Universities Space Research Association (USRA) launched a Quantum Artificial Intelligence Lab based on the D-Wave Two 512-qubit quantum computer that would be used for research into machine learning, among other fields of study.^[R18]

kenny?

Coordinates: 49°25′56.13″N 122°9′50.45″W﻿ / ﻿49.4322613°N 122.9973472°W﻿ / 49.4322613; -122.9973472

D-Wave Systems Inc.

| | |
|---|---|
| D:WAVE The Quantum Computing Company™ | |
| Type | Privately held company |
| Industry | Computer hardware |
| Founded | 1999; 22 years ago |
| Headquarters | Burnaby, British Columbia, Canada |
| Key people | Alan Baratz, CEO Geordie Rose, Founder Eric Ladzinsky, CS V. Paul Lee, Chair |
| Products | D-Wave One, D-Wave Two, D-Wave 2X, D-Wave 2000Q |
| Revenue | N/A |
| Net income | N/A |
| Number of employees | 160+ ^[1] |
| Subsidiaries | D-Wave Government |
| Website | www.dwavesys.com |



D-Wave at the SC18 conference

Interestingly **VW recently implemented D-Wave** tech as well. Who was it that dealt with a short squeeze in the past? Yes the service used among many high end companies, I will have another look into it shortly, alas;

Nothing is a coincidence

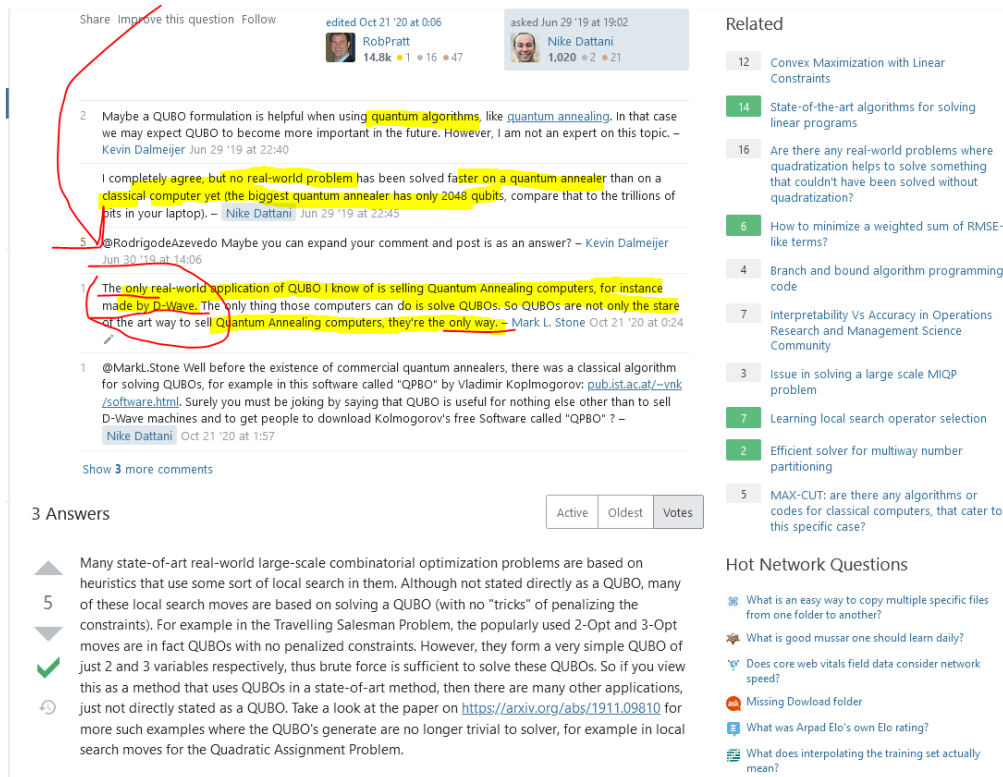
I was curious about this D-Wave and so I returned to google and...ponder to one of my many, MANY questions in life:

Do sheep ever just get bored standing around all day long doing nothing but just eating the same food, within the confines of a closed & naive existence bordered by the hedgerows of blissful ignorance?

I mean if you look at the history of the cat, it is the only animal in history to self domesticate itself to cohabit with humans as their natural instincts were a mutual accompaniment to human civilization, simply because they wanted to.....meh.....

'cLicKety Click'

Oh for the love of god here we go again.....



Share Improve this question Follow

edited Oct 21 '20 at 0:06 RobPratt 14.8k • 1 • 16 • 47

asked Jun 29 '19 at 19:02 Nike Dattani 1,020 • 2 • 21

2 Maybe a QUBO formulation is helpful when using quantum algorithms like quantum annealing. In that case we may expect QUBO to become more important in the future. However, I am not an expert on this topic. – Kevin Dalmeijer Jun 29 '19 at 22:40

I completely agree, but no real-world problem has been solved faster on a quantum annealer than on a classical computer yet (the biggest quantum annealer has only 2048 qubits, compare that to the trillions of bits in your laptop). – Nike Dattani Jun 29 '19 at 22:45

5 @RodrigodeAzevedo Maybe you can expand your comment and post it as an answer? – Kevin Dalmeijer Jun 30 '19 at 14:06

1 The only real-world application of QUBO I know of is selling Quantum Annealing computers, for instance made by D-Wave. The only thing those computers can do is solve QUBOs. So QUBOs are not only the state of the art way to sell Quantum Annealing computers, they're the only way. – Mark L. Stone Oct 21 '20 at 0:24

1 @MarkL.Stone Well before the existence of commercial quantum annealers, there was a classical algorithm for solving QUBOs, for example in this software called "QPBO" by Vladimir Koplomgorov: publist.ac.at/~vnlk/software.html. Surely you must be joking by saying that QUBO is useful for nothing else other than to sell D-Wave machines and to get people to download Kolmogorov's free Software called "QPBO" ? – Nike Dattani Oct 21 '20 at 1:57

Show 3 more comments

3 Answers

Active Oldest Votes

5 Many state-of-art real-world large-scale combinatorial optimization problems are based on heuristics that use some sort of local search in them. Although not stated directly as a QUBO, many of these local search moves are based on solving a QUBO (with no "tricks" of penalizing the constraints). For example in the Travelling Salesman Problem, the popularly used 2-Opt and 3-Opt moves are in fact QUBOs with no penalized constraints. However, they form a very simple QUBO of just 2 and 3 variables respectively, thus brute force is sufficient to solve these QUBOs. So if you view this as a method that uses QUBOs in a state-of-art method, then there are many other applications, just not directly stated as a QUBO. Take a look at the paper on <https://arxiv.org/abs/1911.09810> for more such examples where the QUBO's generate are no longer trivial to solve, for example in local search moves for the Quadratic Assignment Problem.

Related

- 12 Convex Maximization with Linear Constraints
- 14 State-of-the-art algorithms for solving linear programs
- 16 Are there any real-world problems where quadratzation helps to solve something that couldn't have been solved without quadratzation?
- 6 How to minimize a weighted sum of RMSE-like terms?
- 4 Branch and bound algorithm programming code
- 7 Interpretability Vs Accuracy in Operations Research and Management Science Community
- 3 Issue in solving a large scale MIQP problem
- 7 Learning local search operator selection
- 2 Efficient solver for multiway number partitioning
- 5 MAX-CUT: are there any algorithms or codes for classical computers, that cater to this specific case?


Hot Network Questions


- What is an easy way to copy multiple specific files from one folder to another?
- What is good mussar one should learn daily?
- Does core web vitals field data consider network speed?
- Missing Download folder
- What was Arpad Elo's own Elo rating?
- What does interpolating the training set actually mean?

<https://or.stackexchange.com/questions/828/what-are-some-real-world-applications-of-qubo>

Well that massively narrows my search lol.....

D-Wave Systems Inc:


 Interested in building in-production quantum applications, but need a bit more help? Sign up now for the D-Wave Launch jump start program for business and we'll connect you with quantum experts. [GET CONNECTED](#)





The first and only quantum computer
built for business

[Get Started](#)

250+ User-developed early quantum applications on D-Wave systems, including airline scheduling, election modeling, quantum chemistry simulation, automotive design, preventative healthcare, logistics, and much more.

Optimization


Machine Learning


Materials Science


About D-Wave Systems Inc.

D-Wave is the leader in the development and delivery of quantum computing systems, software, and services and is the world's first commercial supplier of quantum computers. Our mission is to unlock the power of quantum computing for the world. We do this by delivering customer value with practical quantum applications for problems as diverse as logistics, artificial intelligence, materials sciences, drug discovery, cybersecurity, fault detection, and financial modeling. D-Wave's systems are being used by some of the world's most advanced organizations, including NEC, Volkswagen, DENSO, Lockheed Martin, USRA, USC, Los Alamos National Laboratory, and Oak Ridge National Laboratory. With headquarters near Vancouver, Canada, D-Wave's US operations are based in Palo Alto, CA and Bellevue, WA. D-Wave has a blue-chip investor base including PSP Investments, Goldman Sachs, BDC Capital, DFJ, In-Q-Tel, PenderFund Capital, 180 Degree Capital Corp., and Kensington Capital Partners Limited. For more information, visit: www.dwavesys.com.

Getting Started with the System

I pulled this little list from their manual pages on D-Wave, explaining everything pretty well!

Introduces the D-Wave quantum computer, provides some key background information on how the system works, and explains how to construct a simple problem that the system can solve.

- Welcome to D-Wave
- What is Quantum Annealing?
- Solving Problems with D-Wave Solvers
- D-Wave QPU Architecture: Topologies
- Simple Example: Solving a SAT Problem
- Constraints Example: Problem Formulation
- Constraints Example: Minor-Embedding
- Constraints Example: Submitting to a D-Wave System
- Appendix: Next Learning Steps

https://docs.dwavesys.com/docs/latest/doc_getting_started.html

I'm not happy with all the analyses that go with just the classical theory, because Nature isn't classical, dammit, and if you want to make a simulation of nature, you'd better make it quantum mechanical, and by golly it's a wonderful problem, because it doesn't look so easy.

It's not a Turing machine, but a machine of a different kind.

—Richard Feynman, 1981

.....And yet it can't compute when a simple ape just likes a stock!

Think Ying & Yang

How Quantum Annealing Works in D-Wave Systems ↗

The quantum bits—also known as *qubits*—are the lowest energy states of the superconducting loops that make up the D-Wave QPU. These states have a circulating current and a corresponding magnetic field. As with classical bits, a qubit can be in state of 0 or 1; see Figure 4. But because the qubit is a quantum object, it can also be in a superposition of the 0 state and the 1 state at the same time. At the end of the quantum annealing process, each qubit collapses from a superposition state into either 0 or 1 (a classical state).

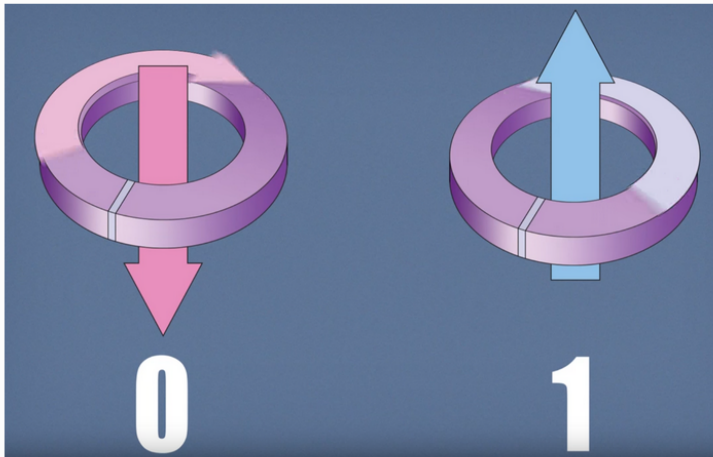


Fig. 4 A qubit's state is implemented as a circulating current, shown clockwise for 0 and counter clockwise for 1, with a corresponding magnetic field.

Quick fire question: How many boxes does a hedgeie fill in to qualify to turn it on?
You decide

- Accelerate your decisions, right now**
Qatalyst applies quantum techniques to enhance the quality and performance of classical computations. Right now.
- Faster, better optimization results**
Improve the performance and range of solutions for your real-world constrained optimization problems, even on classical computers
- No quantum expertise required**
SMEs and programmers solve their first complex problems within a week, as compared to 6-12 months with quantum software toolkits requiring complex programming.
- Simple access to diverse QPUs**
Immediately access the power of quantum across diverse QPU vendors, in the cloud. No need for low-level coding, no on-premise requirements.

Answer: >Meow<

Seamless path to quantum evolution

Explore the power you can expect from quantum computing today, knowing that you're ready to leverage tomorrow's quantum technology when it's ready for prime time.

Discover Qatalyst



And lastly, this little nugget; **QATALYST**

Now before we take a bit of a deeper look into Qatalyst I just wanted to cover,

D-Wave isn't some kind of fantasy futuristic technology, plenty of well known companies already use the software and technology.

Companies like google and NASA use it

Skimming through having a glance like the many sites before it, I picked up on something interesting. Every now and again **Qatalyst** kept popping up.

Hedgie probably would have been better going down these wiki links instead lol,

https://en.wikipedia.org/wiki/Mathematical_finance#Risk_and_portfolio_management:_the_P_world

https://en.wikipedia.org/wiki/Outline_of_finance#Quantitative_investing

I mean I don't know how hard it is to research, laziness just I guess? Especially if it's not your money you're playing with.....

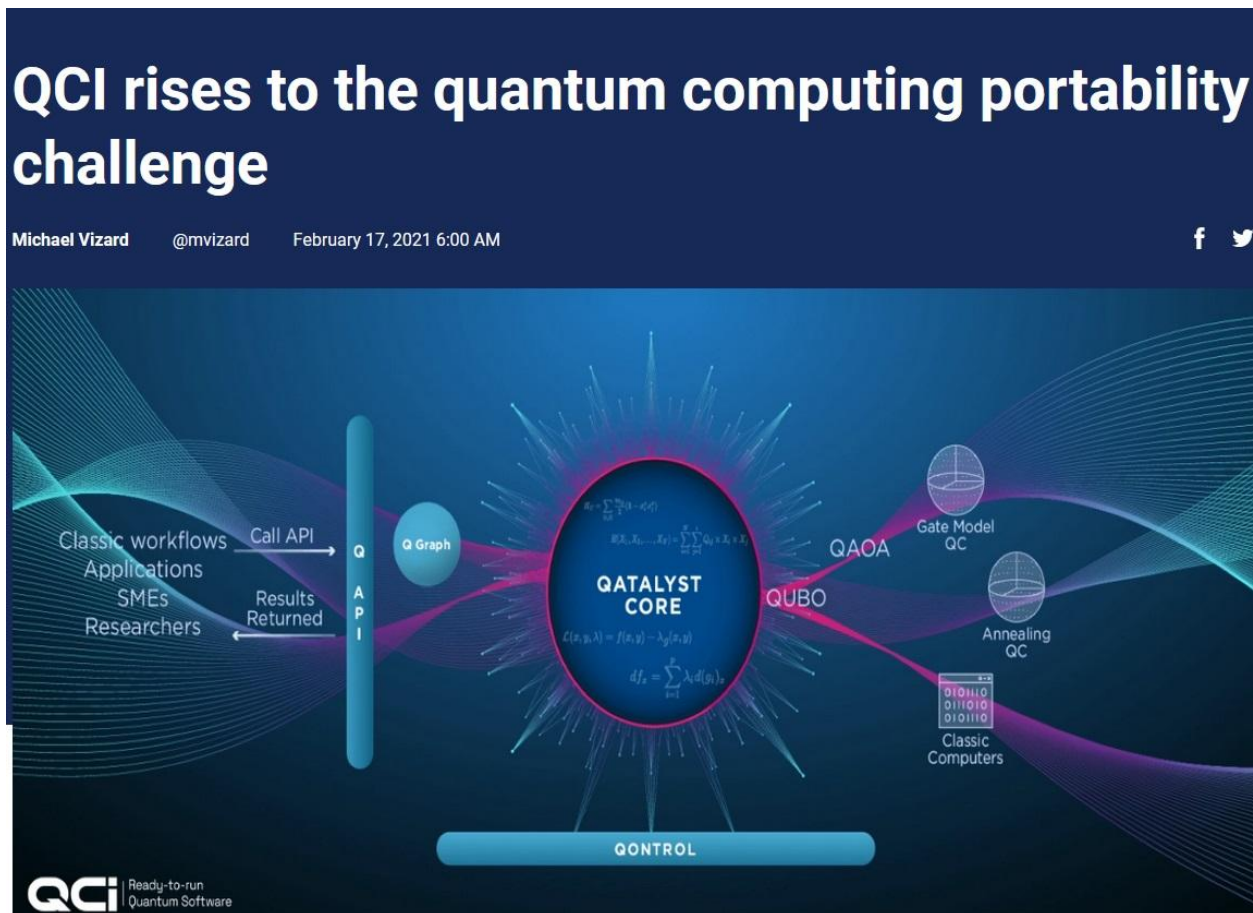
I digress.....

And so that leads us into.....

CHAPTER 4:

HFT (high frequency trading)

<https://www.quantumcomputinginc.com/products>



Quantum power, no complexity

Catalyst bridges the power of quantum to enhance classical computing performance and quality of results.

State-of-the-art computational optimization

Qatalyst features a variety of complex mathematical modules to prepare, optimize, iterate, and solve complex computations.

Quantum-ready decisions, Right now.

Featuring state-of-the-art quantum-ready computational engines, the Core accelerates your time-to-results while delivering more and better solutions for your optimization problems.

The Core integrates specialized mathematical operations with complex constrained optimization techniques to deliver fast, excellent results.

It automatically transforms today's real-world problems into quantum-ready requests and processes those requests on classical and/or quantum processors. No programming required.

You stay focused on solving your problems, not learning a complicated new programming paradigm and complex mathematical operations.

<https://www.quantumcomputinginc.com/news/qci-applies-quantum-software-across-six-business-segments>

<https://www.quantumcomputinginc.com/products>

“The hype around quantum computing is real--as is the potential for quantum to transform the way we use complex computational techniques to fuel more informed business decisions.

But it may be years before quantum processors are readily available.

Is there anything that can be done in the meantime to position your business to take advantage of this game-changing technology?

The answer is an unequivocal YES and this Executive Brief outlines three ways you can prepare your business today to be ready for quantum tomorrow.”

<https://www.quantumcomputinginc.com/three-ways-to-make-your-business-quantum-ready>

They Have a Guide And Everything for You to Look @MIT_Sloan



Three Ways To Make Your Business Quantum Ready

Quantum Computing Inc. | (703) 436-2161 | quantumcomputinginc.com

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Now i'm intrigued we gotta google more about this:

<https://finance.yahoo.com/news/quantum-computing-inc-enters-3-123100059.html>

Seems like QCI are the top dogs of quantum computations if you have a fondness of simulated annealing then I take it?

QCI 2020 shareholder letter:

https://assets.website-files.com/600b3b85ede46863c1131e0e/601c97df775058636dcb4d11_QC-I-Shareholder-Letter.pdf

And so this is us back within 1QBit...

WIKIPEDIA
The Free Encyclopedia

1QBit

From Wikipedia, the free encyclopedia

1QBit Information Technologies, Inc. (1QBit) is a **quantum computing** software company, based in Vancouver, British Columbia. 1QBit was founded on December 1, 2012^[1] and has established hardware partnerships with Microsoft, IBM, Fujitsu and **D-Wave Systems**.^[2] While 1QBit develops general purpose algorithms for quantum computing hardware, the organization is primarily focused on **computational finance**, materials science, and the life sciences.^[3]

Contents [hide]

- Technology
- History
- Locations
- See also
- References
- External links

Technology [edit]

1QBit has divisions focused on universal quantum computing, advanced AI techniques, cloud based quantum processing, and hardware innovation.

1QBit's 1Qcloud platform is focused on optimization including reformulating optimization problems into the quadratic unconstrained binary optimization (QUBO) format **necessary to compute with quantum annealing** processors and similar devices from organizations such as Fujitsu, **D-Wave**, Hitachi and NTT, while their QEMIST platform is focused on advanced materials and quantum chemistry research with universal **quantum computing processors**.^[4]

History [edit]

1QBit was founded as the first dedicated quantum computing software company in 2012.^[5] In 2013, 1QBit raised seed funding from US and Canadian angel investors, before closing a **Series A** financing round led by the Chicago Mercantile Exchange in 2014.^[6] On August 5, 2015 the World Economic Forum announced 1QBit as a recipient of the 2015 Technology Pioneer Award^[7] recognizing 1QBit as a leader among the world's most promising technology companies.^[8] In 2017, 1QBit raised a \$45M Series B financing round led by Fujitsu with participation from Allianz, Accenture, The Royal Bank of Scotland and **The Chicago Mercantile Exchange**.^[9] In April 2018, **1QBit joined the IBM Q Network, a global community of leading Fortune 500 companies, academic institutions, startups, and national research labs designed to explore practical applications for quantum computing**.^[10]

In May 2020, 1QBit and its collaborators serving health authorities from East to West obtained support from the Digital Technology Supercluster to facilitate the clinical implementation of XrAI, the first Artificial Intelligence (AI) radiology platform to be accredited by Health Canada as a Class II Medical Device.^[11]

Locations [edit]

1QBit is headquartered in Vancouver, British Columbia, Canada.^[12] In early 2019, 1QBit opened a hardware innovation lab at the University of Waterloo in Waterloo, Ontario.

See also [edit]

1QBit Information Technologies Inc.

| | |
|----------------------------|--|
| Type | Privately held company |
| Industry | Software |
| Founded | December 1, 2012 |
| Headquarters | Vancouver, British Columbia, Canada |
| Key people | Andrew Furzman Landon Dovers |
| Number of employees | 100 (2020) |
| Website | www.1qbit.com |

'cLicKety Click'

Oh for the love of god here we go again.....

<https://1qbit.com/>

From their website:

WHY WE EXIST

We identify intractable industry problems and build the software necessary to harness the best classical and quantum hardware technologies to solve them.

Technology is continually scaling, and we believe applications should be built to scale alongside it. 1QBit is dedicated to solving industry's most demanding computational challenges by building software that allows applications to continually benefit from advances in both quantum and classical hardware.

1QBit redefines intractable problems by reframing them to achieve superior results using the most effective quantum and classical processors built to date. We work with our partners to build industry applications on our hardware-agnostic platform to produce the best available results today, while continually improving these results through the ability to switch the underlying solver as new releases and hardware architectures are developed.



A Comparison of Text Sentiment and Market Sentiment

US Treasury 10-Year Note Futures and Changes to Cash in Circulation using Sentiment Analysis and the CME Market Sentiment Meter

<https://stagingqbit2.wpengine.com/wp-content/uploads/2021/05/1QBit-White-Paper-A-Comparison-of-Text-Sentiment-and-Market-Sentiment.pdf>

Is it possible to short a bond?

Bonds, like any other security, experience market fluctuations, traders may be eager to profit from a bet that the price of a bond will go lower. You can sell a bond short, but it can be trickier than shorting stocks.

- It is possible to sell short bonds by borrowing them and selling them in the market, hoping to buy them back lower.
- But there are certain issues such as making required interest payments that make shorting bonds more complicated than shorting stocks.
- Other ways of betting against the bond market is through inverse ETFs.

And who was it again that was rumoured to be shorting treasury bonds?

.....rehypothecation

A Comparison of Text Sentiment and Market Sentiment: US Treasury 10-Year Note Futures and Changes to Cash in Circulation using Sentiment Analysis and the CME Market Sentiment Meter

By Pazinski Hong & Anish R. Verma

The CME Market Sentiment Meter (MSM) calculates market sentiment states based on a novel mixture distribution, taking input from options and futures settlement data. We compare market sentiment from financial data to text sentiment from sentiment analysis as an indicator for market trends due to external events. Both types of sentiment were explored in a case study of the year 2020 about the US Treasury 10-Year Note futures (TYF). The year brought large fluctuations in the US economy due to the COVID-19 pandemic and other major events...

[READ MORE](#)

Trading Algorithm Navigation Using a Mixture Distribution Risk Model

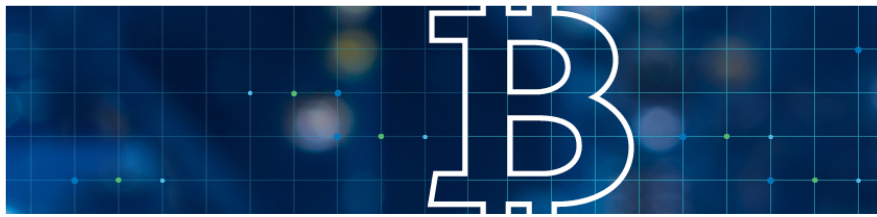
By [Andrew Milne](#), [Anish R. Verma](#), [Phil Goddard](#), & [Clemens Adolphs](#)

The CME Market Sentiment Meter (MSM) provides a daily risk-return estimate for eight products traded on CME Group exchanges: corn (C), crude oil (CL), euro/USD FX (EC), S&P 500 index e-minis (ES), gold (GC), natural gas (NG), soybeans (S), and 10-year treasury notes (TYF). The Market Sentiment Meter is computed by 1QBit using end-of-day settlement data published by CME Group. It is available as a subscription product through CME DataMine.

The MSM risk-return estimate can be used to “navigate” a trading algorithm. We do this by finding a “navigation parameter”, typically an algorithm setting that works successfully at a constant value, but where the best value is sensitive to changes in market volatility. We then define a “predictor”, where an MSM time series is used to estimate the best value of the navigation parameter for succeeding days.

[WHITE PAPER](#)

<https://1qbit.com/our-thinking/white-papers/>



Bitcoin futures and options on futures

Hedge bitcoin exposure or harness its performance with futures and options on futures developed by the leading and largest derivatives marketplace.

<https://www.cmegroup.com/trading/bitcoin-futures.html>

A Tool to Make You More Money

The CME Market Sentiment Meter (MSM) was created by 1QBit and the CME Group. It offers new trading insights by putting numbers to market expectations.

The MSM uses settlement data on eight major futures and options markets to estimate the likelihood of price movements. The MSM is based on money-at-risk in the open market, not just chatter and fake news.

Knowing what people are trading far out the curve adds another dimension to analyzing a market. The MSM is a metric with better forecasting and statistics that you can use to make more money from algorithmic trading.

1QBT - Chicago Mercantile exchange

Remember how in “TLC:THE LONG CON” how we tied the loose ends of the FTX LP token usage to create mirrored synthetic assets?

CME Market Sentiment Meter

Better risk management.
Higher returns from algorithmic trading.

CONTACT US

Remember?

Ken 'I don't know what a token is' Griffin



WeR f0to Goo0oo?

<https://filthylucre.com/ken-griffin-blasts-bitcoin-again/>

CHAPTER 5:

TENET

Well, I'm sure you were probably wondering after having got this far why chapter 1 was so short compared to your traverses through quantum computing so I thought we could continue again from where we abruptly stopped so early on and go full TENET on Common denominators

If you made it this far...

Sit.

Rest, weary traveler. For you are in the company of friends and allies here, a respite from the dark worlds of fraud and cronyism.

TL;DF(Too long, didn't fantasy): The ring just landed in the fires of Mordor.

(loved it!)

Nerd joke for you:

Q: What happens when a simulated annealing quantum computing high frequency trading bot runs into a load of apes who just simply like a stock?

A: <https://www.youtube.com/watch?v=WOdjCb4LwQY> >Meow<

A little fun I had when I got sidetracked, interesting little nugget to read:

https://en.wikipedia.org/wiki/Travelling_salesman_problem

Think of it like a delivery driver planning out their route for the day to make it as efficiently as possible, as easily and comfortably as possible. It's a great read when you figure it all out and how it all ties in together.

And so...The Common Denominators:

<http://hyperphysics.phy-astr.gsu.edu/hbase/quantum/schr.html>

https://en.wikipedia.org/wiki/Simulated_annealing

https://en.wikipedia.org/wiki/D-Wave_Systems

<https://www.quantumcomputinginc.com/>

<https://1qbit.com/>

<https://www.cmegroup.com/>

Let $s = s_0$

- For $k = 0$ through k_{\max} (exclusive):
 - $T \leftarrow \text{temperature}((k+1)/k_{\max})$
 - Pick a random neighbour, $s_{\text{new}} \leftarrow \text{neighbour}(s)$
 - If $P(E(s), E(s_{\text{new}}), T) \geq \text{random}(0, 1)$:
 - $s \leftarrow s_{\text{new}}$
- Output: the final state s

Or as Jesse would say: *Simulated annealing yo.....science bitch!*



Image: Marikray/istock.com

12 February 2021

US

Reporter Alex Pugh

Share this article

International brokers sued over naked short selling allegations

CIBC, Bank of America, UBS and TD Bank stand accused of coordinating “abusive” naked short selling and spoofing strategies in US and Canadian stock markets by a Bermuda hedge fund that claims to have lost tens of millions of dollars as a result.

Harrington Global Opportunity Fund has filed a suit at the US District Court for the Southern District of New York alleging that various US and Canadian financial institutions, through their broker divisions, manipulated markets and drove down pharmaceutical company ADVANZ PHARMA's (formerly Concordia) share price in 2016.

The specialist pharmaceutical recapitalised and rebranded in 2018 after being embroiled in a long-running dispute over apparent price hikes and accusations of mismanagement by its founder and CEO Mark Thompson, who stepped down in 2016.

According to the suit, the defendants, which include several unnamed US and Canadian individuals, allegedly flooded the market with false sell signals by simultaneous naked short selling — in which the trader does not borrow a stock, or determine that it can be borrowed, before they short sell — and spoofing — a form of high-frequency trading that artificially inflates perceived demand of a security — which created millions of 'phantom' shares.

These practices violate the US Securities Exchange Act 1934 and Regulation SHO.

The result, Harrington suggests, is that Concordia's stock price tumbled from \$34.77 to \$1.83 over 11 months.

https://www.securitiesfinancetimes.com/securitieslendingnews/industryarticle.php?article_id=224548&navigationaction=industrynews&newssection=industry

Citadel Securities Pays \$97m to Settle with China Regulators

In 2015, Citadel Securities saw one of its accounts, managed by a Shanghai-based futures firm, barred from trading shares

<https://www.financemagnates.com/institutional-forex/regulation/citadel-securities-fined-97m-in-china-for-malicious-short-selling/>

Citadel Securities, a unit of US hedge fund Citadel, said one of its accounts in China has been barred from trading shares by securities regulators, making it one of the first foreign institutional investors to be caught up in Beijing's crackdown on "malicious short-selling" that the central government has blamed for the recent market rout.

The targeted account was managed by a Shanghai-based futures trading firm owned by Citadel, the Chicago-based hedge fund said. It was among 24 accounts barred from the mainland's two major stock exchanges on Friday for three months.

"We can confirm that while one account managed by Guosen Futures - Citadel (Shanghai) Trading - has had its trading on the Shenzhen Exchange suspended, we continue to otherwise operate normally from our offices, and we continue to comply with all local laws and regulations," Citadel said.

The order to bar the Citadel account was given by the Shenzhen stock exchange.

The China Securities Regulatory Commission has said "coordinated stock dumping" and "selling-off of heavily weighted stocks" as well as automated, algorithm-driven trading caused market turbulence. Citadel is being probed for "spoofing", a practice that involves placing and then cancelling orders, distorting prices in the process.

Beijing's moves show the regulators are "cleaning up" what they believe to be the black sheep in the market, said Oliver Rui, a finance and accounting professor at the China Europe International Business School.

"Some hedge funds might have taken advantage of the regulatory loopholes in China for arbitrage opportunities," Rui said. "Automated trading is an area Beijing ought to be concerned about as it has been a major driver of US stock market crashes."

8:10 PM BST
Last Updated 11 days ago

business

'Meme' stock prices may not properly reflect demand -NYSE president

2 minute read

John Mccrank



<https://www.reuters.com/business/meme-stock-prices-may-not-properly-reflect-demand-nyse-president-2021-06-16/>

SOMEONE'S DEEP LEARNING, INTELLIGENCE AUGMENTING, HIGH FREQUENCY TRADING, QUANTUM COMPUTING DIP MACHINE BROKE YO.



@GARYGENSLER

@MIT_SLOAN

@STACEYCUNNINGHAM #NYSE_PRESIDENT

@SEC

#SEC_OWE_APE_TENDIES_REWARD #THE_PRICE_IS_FAKE

<https://www.sec.gov/whistleblower/submit-a-tip> ← tendies 4 all

Machines manipulate the truth! Look through the eyes of an ape and tell me you can't see the fakery for what it is?

What is a Black Swan again?

A black swan is an unpredictable event that is beyond what is normally expected of a situation and has potentially severe consequences. Black swan events are characterized by their extreme rarity, severe impact, and the widespread insistence they were obvious in hindsight.

A White Swan on the other hand,

A white swan is a highly certain event with three principal characteristics: it is certain; it carries an impact that can easily be estimated; and, after the fact, we concoct an explanation that recognizes the certainty of occurrence, but again, shifts the focus to errors in judgement or some other human form of causation,

How am I sure I'm right? [APE HAD TO BURN PHONE :\(](#)

Where again was it that google search trends for 'Glacier Capitals' spiked before it even existed?

THIS IS WHY I DOUBLE DOUBLED DOWN

Shush Eric,

DIP:MACHINE:BROKE:BUY:HOLD:BUCKLE.UP



and so you saw, that really:

I am only but a humble ape

QUANT-APE QUANTUM COMPUTING

Congratulations on your new degree from: The University of Superstonk



I JUST LIKE THE STOCK!

As above & so below

[>Meow<](#)

[>PppurrrrrrrRrrrrRRrrrrrrRrrrrRrrrrRrrr<](#)



BUY, HODL, BUCKLE UP.

Every path followed is the same path walked.



CANTSTOP. WONTSTOP. GAMESTOP.

I am not a cat

