Building The AI Machine

— Standardized Deployment of AI-Based Trading Strategies

Pycon APAC, Singapore, 01. June 2018

Dr. Yves J. Hilpisch

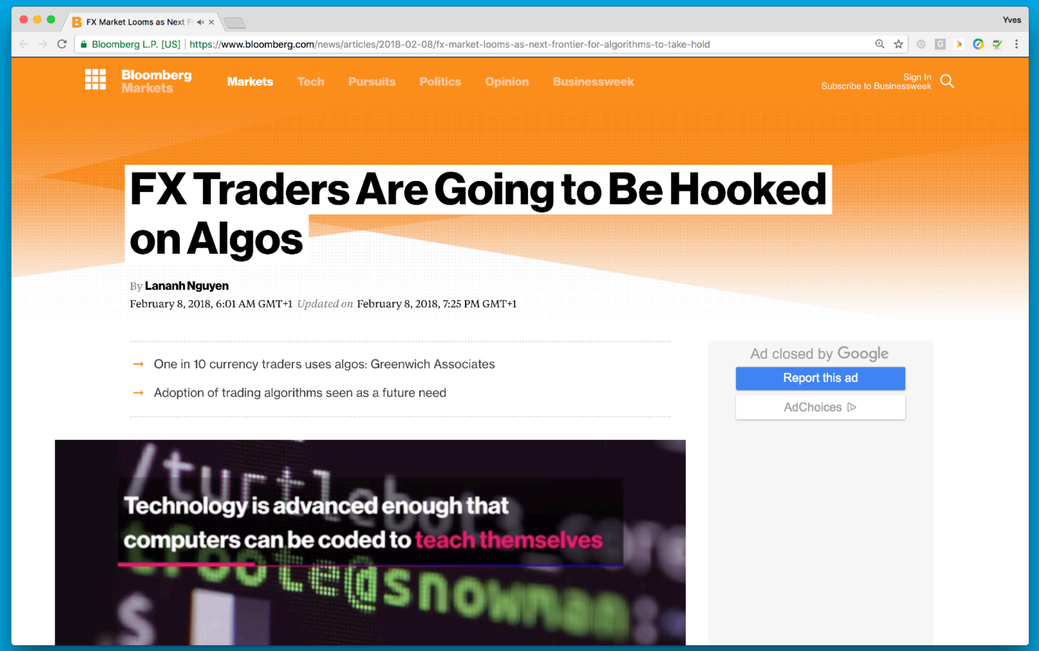
THE PYTHON QUANTS





Georgetown Students turn $1 Million into $383 Billion in University Challenge.

A Georgetown McDonough team won the “Best Hedge Fund Strategy Award” in the Peeptrade Challenge, a simulated investment competition, the event was hosted by the University of Chicago. The students set up a global record with a 38 million percent return.



In a few years, currency traders will be hooked on algos like their stock-market colleagues.

That's the view of David Stryker, a principal at consulting firm Greenwich Associates LLC, who sees foreign-exchange markets following equities in the widespread adoption of computerized trading.

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While only one in 10 FX traders currently uses algos to execute trades, the adoption rate is higher at the largest institutions, with one in four deploying the systems, according to a Greenwich study released Thursday. In comparison, in equities more than half of volume is done through an algorithm. The firm surveyed 79 currency-market participants at hedge funds, asset managers, corporations and other financial institutions in the U.S. and Europe.

"Given the myriad benefits that algos offer, FX traders currently not using algos (and not considering them) may soon have to determine whether they're putting themselves at a disadvantage," Stryker wrote in the study. "With all of the data available demonstrating the benefits/cost savings, the ability to execute a trade with an algo will soon become a 'need' as opposed to a 'nice to have.'"

Almost 60 percent of respondents said algos had materially cut trading costs, according to the survey. The push to save money, combined with stricter regulation, will boost the appeal of trading software, Greenwich concluded.

AGENDA

- Introduction
- Data-Driven Finance
- AI-First Finance
- Example Strategy
- The AI Machine
- Outlook

Introduction

SERVICES
for financial institutions globally

EVENTS
for Python quants & algorithmic traders

CERTIFICATION
in cooperation with university

TRAINING
about Python for finance & algorithmic trading

BOOKS
about Python and finance

PLATFORM
for browser-based data analytics

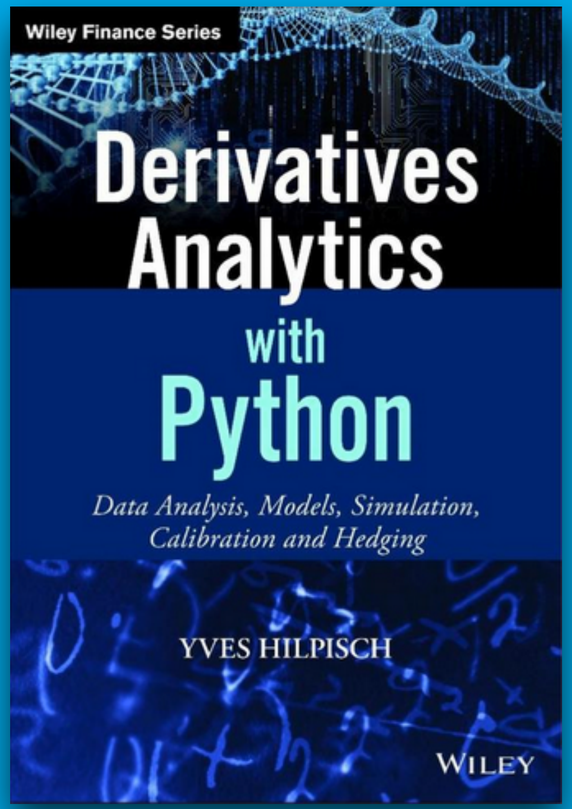
OPEN SOURCE
Python library for financial analytics

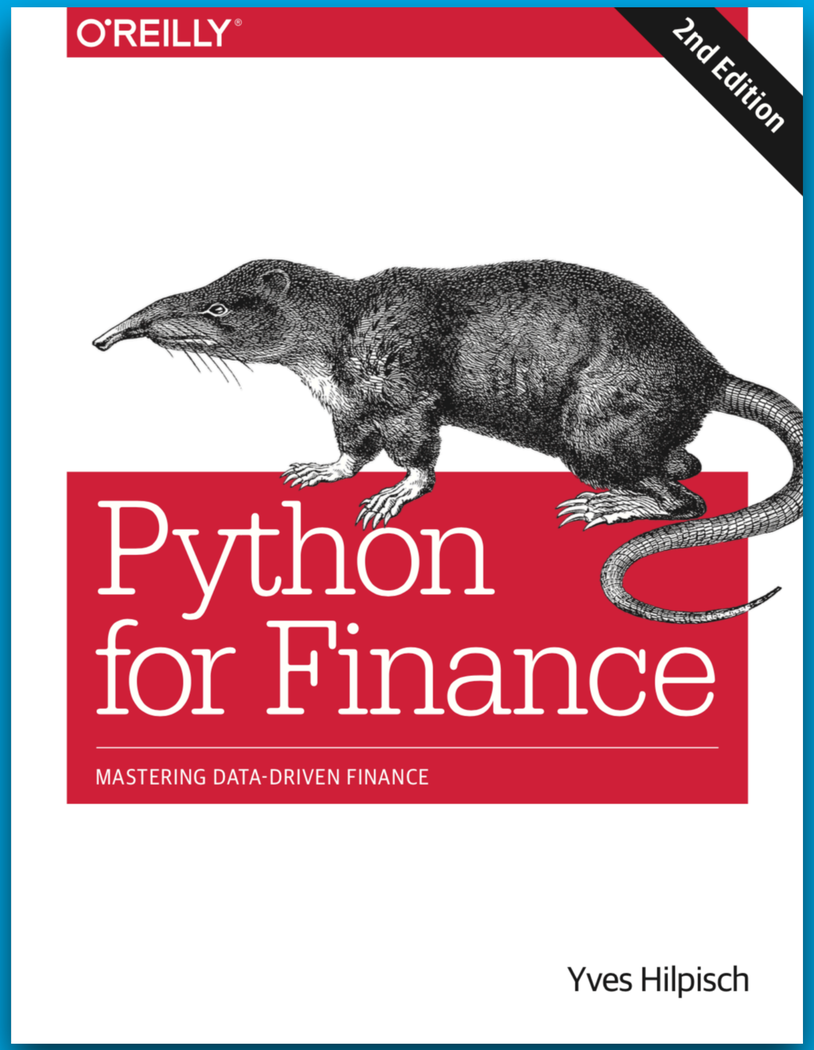


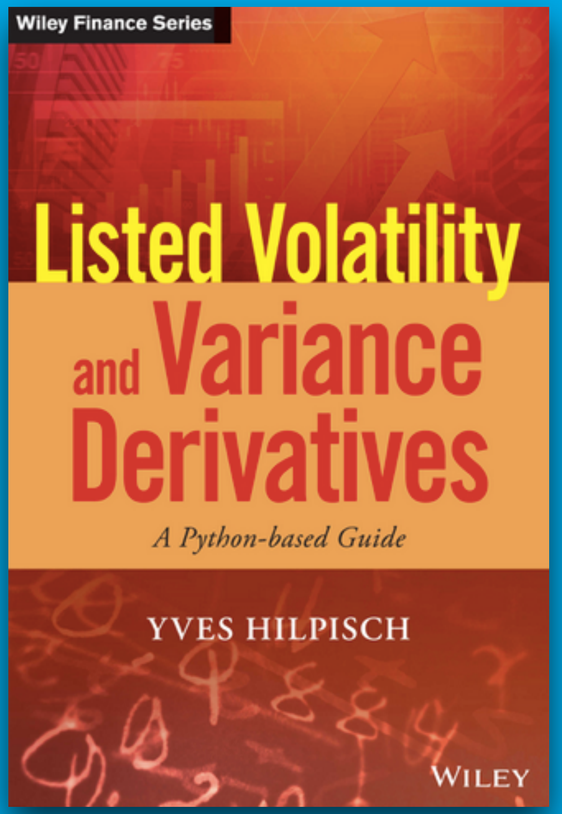
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Data-Driven Finance

FINANCIAL TIMES

TUESDAY 3 OCTOBER 2017 — WORLD BUSINESS NEWSPAPER — MIDDLE EAST

Mohamed El-Erian
Reasons to worry about the Fed's 'beautiful normalisation' — PAGE 20

Torturing Theresa
Boris Johnson's bid to dictate May's Brexit strategy — JANAN GANESH, PAGE 11



Confined in a circle
The myths that hold back women in Indian society — AMY KAZMIN, PAGE 10

Las Vegas reels from worst US mass shooting

A casualty is carried from the scene after a gunman opened fire on concert-goers in Las Vegas on Sunday night. More than 58 people were killed and over 515 wounded, making it the deadliest mass shooting in US history.

Las Vegas police said the suspected gunman, 64-year-old Stephen Paddock, fired shots from his 32nd floor room in the Mandalay Bay Hotel and Casino into the crowd of 22,000 people attending the Route 91 Harvest Festival.

In televised remarks, Donald Trump, the US president, called the shooting "an act of pure evil" but made no reference to guns. He plans to visit the city on Wednesday to meet the families of the victims and law enforcement officials.

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Daniel Becker/Getty Images

Briefing

▸ Puerto Rico calls for billions in aid
Enid Maldonado Gautier, Puerto Rico's treasury secretary, says the island will need "tens of billions" of dollars in aid from the US as it struggles to recover after Hurricane Maria.— PAGE 2

▸ Portugal's Socialists reap benefits
Portugal's ruling Socialists reaped the rewards of a recovering economy by winning a decisive victory in local elections midway through the first term of an anti-austerity government.— PAGE 3

▸ Uber's UK head quits as chief flies in
Jo Bertram, Uber's UK boss, has quit the company a day before a visit to London by Dara Khosrowshahi, chief executive, to meet regulators over a threat to revoke the ride-hailing app's licence in the capital.— PAGE 13



▸ Koike faces Japan election dilemma
Tokyo governor Yuriko Koike is under pressure to stand in Japan's general election later this month, amid fears she and her party lack the resources to beat Shinzo Abe, the prime minister.— PAGE 4

▸ Equifax defends silence over hack
Credit reference agency Equifax has claimed ahead of a hearing at the US Congress later today that disclosing that it had been hacked would have encouraged "copycat" cyber attacks.— PAGE 13

▸ Western envoys warn on Kenya re-run
Western ambassadors have condemned President Uhuru Kenyatta and Raila Odinga, opposition leader, for undermining the electoral commission's ability to restage its election this month.— PAGE 4

▸ Huawei beats Apple as top China choice
Huawei has for the first time beaten Apple to top spot for intended smartphone purchases in China, according to a survey of 1,000 consumers.— PAGE 14

Datawatch

US manufacturing purchasing managers' index
Above 50 = growth



US manufacturing activity as measured by the Institute of Supply Management was at its highest level in September since the summer of 2004

Sources: Thomson Reuters Datastream; ISM

Catalan president urges Brussels to mediate in independence clash

Region seeks to avoid 'traumatic split' from Spain ● EU says dispute is 'internal matter'

MICHAEL STOTHARD — BARCELONA
IAN MOUNT — GIRONA

The Catalan government said it wanted to avoid a "traumatic split" from Spain and appealed to the EU to mediate with Madrid in signs it was holding back from an early declaration of independence after Sunday's secession referendum.

Carles Puigdemont, the Catalan president, said that after Sunday's vote, when 90 per cent of the 2.3m ballots cast were in favour of independence, Catalonia now had the right to be free from Spain. But he hinted that this would not happen immediately.

"There is no button to push for independence, it does not exist," said Mr Puigdemont at a press conference. He called on the EU "to help broker negotiations." "It's obvious we need mediation."

He added: "We don't want a traumatic break. . . We want a new understanding with the Spanish state."

Breaking with its previous reticence to speak out on Catalonia, the European Commission condemned the violent clashes between police seeking to block the poll and voters. It urged both sides to reach an agreement.

"We call on all relevant players to now move very swiftly from confrontation to dialogue," it said. But it stopped short of offering to broker talks, repeating the issue was an "internal matter".

Financial markets have been rattled by the vote, which raised fears of an immediate break with Spain. Madrid's main equities benchmark, the Ibex 35, closed down 1.2 per cent and yields on 10-year Spanish bonds were up 7 basis points. Sunday's referendum, while illegal and invalid under Spanish law, was also a historic challenge to the authority of the Spanish state that threatens to plunge the country into a political and constitutional crisis.

As Mariano Rajoy, Spain's prime minister, met other party leaders, his government gave little sign it was open to talks as long as the separatist Catalan government pushes for full independence from Spain.

Fernando Martínez-Maíllo, a senior member of the governing Popular party, said the election had been a "grand farce" and the Catalan regional government has been "delegitimised".

Rafael Catalá, the justice minister, said that the government would use all the tools at its disposal — including if necessary the suspension of Catalonia's autonomy — to enforce the rule of law.



Carles Puigdemont, the Catalan president, is leaving the door open to a unilateral declaration of independence

There were also hawkish calls by Albert Rivera, the head of the liberal Ciudadanos party which supports the PP government, to suspend Catalonia's autonomy immediately.

Mr Puigdemont demanded the central government withdraw the national police reinforcements it deployed to the region over the weekend to thwart the poll, forcibly in many instances.

The Catalan leader has still left the door open to a unilateral declaration of independence unless talks with Madrid can start.

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Brussels calls for battery development consortium

Report ▸ PAGE 4

Scientists who unwound the workings of human body clock win Nobel Prize

CLIVE COOKSON — SCIENCE EDITOR

Three American scientists have won the Nobel medicine prize for discovering the molecular workings of the "body clock" in humans and animals that synchronises with the Earth's cycle through night and day.

Jeffrey Hall, Michael Rosbash and Michael Young worked out how a biochemical feedback mechanism maintains our circadian rhythm, the 24-hour cycle of sleep and wakefulness, feeding behaviour, hormone release, blood pressure and other physiological functions.

Their research was carried out mainly during the 1980s and 1990s, working with fruit flies as a "model organism" at Brandeis University in Boston and Rockefeller University in New York. The body clock works in essentially the same way across the animal kingdom, from insects to mammals. Plants too have a similar timekeeping system.

Thomas Perlmann, secretary of the Nobel Assembly, said the reached Professor Rosbash by phone shortly before the announcement was made public in Stockholm: "He was silent and then he said, 'You are kidding me'."

According to the citation for the SKr9m ($1.1m) prize, the researchers "were able to peek inside our biological clock and elucidate its inner workings. Their discoveries explain how plants, animals and humans adapt their biological rhythm so that it is synchronised with the Earth's revolutions."

Juleen Zierath of the Nobel Assembly said the research helped to "raise awareness of the great importance of sleep hygiene and the importance of really making certain we allow ourselves to go to bed at an hour that's suitable".

When we travel across several time zones there is a mismatch between our internal clock and external environment, which produces jet lag. While some people take the hormone melatonin to reset the body clock, scientists are working on a more effective remedy.

The fundamental discovery of the three laureates was that a gene they called "period" and "timeless" set up a feedback loop, in which their activity is inhibited as their protein products build up. The result is a biochemical oscillation over a 24-hour cycle — a body clock that is then regulated by external cues such as light and darkness.

Carles-Isidre at the Karolinska Institute said: "Since the seminal discoveries . . . circadian biology has developed into a vast and highly dynamic research field, with important implications for our health and wellbeing."

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World Markets

STOCK MARKETS				CURRENCIES	Oct 2	prev		INTEREST RATES	price	yield	chg
	Oct 2	prev	%chg	$ per €	1.174	1.182		US Gov 10 yr	99.31	2.33	0.00
S&P 500	2522.54	2519.36	0.13	$ per £	1.307	1.342		UK Gov 10 yr	101.00	1.30	-0.04
Nasdaq Composite	6461.42	6455.36	0.09	$ per €	0.894	0.891		Euro Gov 10 yr	113.40	0.40	0.01
Dow Jones Ind	22405.23	22425.09	0.36	£ per €	1.131	1.135		Jpn Gov 10 yr	100.24	0.07	0.00
FTSEurofirst 300	1532.50	1534.79	0.15	¥ per $	112.710	112.580		¥ per €	132.374	133.124	
Euro Stoxx 50	3559.22	3564.35	0.14	¥ per £	148.812	151.229		US Gov 30 yr	97.07	2.88	0.00
FTSE 100	7438.84	7372.75	0.90	€ index	96.256	93.925		Euro Gov 7 yr	121.87	0.71	0.00
FTSE All-Share	4092.95	4040.85	1.29	$ index	1.142	1.144			price	prev	chg
CAC 40	5310.44	5329.91	0.36	COMMODITIES				Fed Funds FF	1.07	1.07	0.00
Xetra DAX	12762.05	12828.86	0.52		Oct 2	prev	%chg	HSBC 3m $ Libor	1.06	1.06	0.00
Nikkei	20403.76	20398.78	0.02	Oil WTI $	50.48	51.87	-2.30	Euro 3 mth 3m	0.00	-0.00	0.00
Hang Seng	27354.80	27431.85	0.48	Oil Brent $	56.55	56.70	-1.30	HK 3m	0.94	0.93	0.00
FTSE All World $	311.85	311.88	0.00	Gold $	1273.35	1285.10	-0.73	Prices are latest for edition		Data provided by Markitglobal	

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DJIA 15973.13 ▼ 52.40 0.3% — NASDAQ 4060.49 ▼ 0.2% — NIKKEI 15611.31 ▼ 0.29% — STOXX 600 314.91 ▼ 0.7% — 10-YR. TREAS. ▲ 16/32, yield 2.797% — OIL $98.51 ▲ $1.17 — GOLD $1,262.40 ▲ $27.10 — EURO $1.3761 — YEN 102.84

What's News

Business & Finance

GM named its first female CEO, tapping company veteran and product chief Mary Barra to run the auto maker. **A1**

■ **Financial regulators** approved the Volcker rule, which curbs banks' risk-taking and could slash their profits. **A1**

■ **The FDIC board** approved a draft plan to keep parts of a failing financial firm open without a taxpayer bailout. **C2**

■ **Finance ministers** from big euro-zone nations reached an understanding on winding down failing banks. **C3**

■ **Discovery is considering** a bid for Food Network majority owner Scripps, presaging a possible wave of TV deals. **B1**

■ **Stocks declined** as investors weighed the potential impact of reduced Fed stimulus. The Dow dropped 52.40 points. **C4**

■ **OTC stock trading** was halted for about an hour because of a hardware error. **C4**

■ **Smith & Wesson said** profit slid 20% and revenue rose just 2%, as gun sales slow from their recent torrid pace. **B2**

■ **Pacific trade talks** adjourned without a deal amid discord between the U.S. and Japan. **A17**

■ **Italy pulled out** of a two-year contraction in the third quarter, posting flat GDP. **A13**

■ **Three Swiss banks** agreed to participate in a U.S. tax-evasion-disclosure program. **C5**

■ **LightSquared can proceed** with a suit against Dish over a debt purchase, a judge ruled. **B3**

■ **Monsanto is teaming up** with a Danish firm to develop useful microbes for plants. **B4**

World-Wide

■ **Congressional negotiators** struck a budget deal that would allow more domestic and military spending and include deficit-cutting measures. **A1, A8**

■ **Ukrainian forces** stormed a protesters' encampment in Kiev, hours after Western diplomats called for a nonviolent end to the political crisis. **A13**

■ **Obama's disapproval rate** hit 54%, the high for his presidency, amid the flawed health-law rollout, a Wall Street Journal/NBC poll found. **A4**

■ **World leaders gathered** to honor Mandela. In a rare encounter, Obama shook hands with Cuba's Raúl Castro. **A12**

■ **Senate Democrats** confirmed an Obama appeals-court pick and the head of Fannie and Freddie's overseer. **A4**

■ **A key Senate Democrat** said he would back the Obama administration's request to delay new Iran sanctions. **A17**

■ **Supreme Court justices** expressed sympathy for the EPA approach to air pollution that crosses state lines. **A2**

■ **An ADS group called** for a probe to see if HIV-infected patients were discouraged from enrolling in health plans. **A6**

■ **Uruguay's Senate** voted to legalize marijuana. The president plans to sign the bill. **A15**

■ **France's leader** flew to the Central African Republic after two French troops died. **A13**

■ **Singapore police** charged 24 Indian citizens in connection with a night of rioting. **A13**

■ **Died: Jim Hall**, 83, acclaimed jazz guitarist.

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● Heard on the Street: Rule is a means to an end..... C14

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Deal Brings Stability to U.S. Budget

Congressional Negotiators Avert January Shutdown and Soften Sequester Cuts; Airline Fees to Climb

By Janet Hook

House and Senate negotiators, in a rare bipartisan act, announced a budget agreement Tuesday designed to avert another economy-rattling government shutdown and to bring a dose of stability to Congress's fiscal policy-making over the next two years.

Sen. Patty Murray (D., Wash.) and Rep. Paul Ryan (R., Wis.), who struck the deal after weeks of private talks, said it would allow more spending for domestic and defense programs in the near term, while adopting deficit-reduction measures over a decade to offset the costs.

Revenues to fund the higher spending would come from changes to federal employee and military pension programs, and higher fees for airline passengers, among other sources. An extension of long-term jobless benefits wasn't included.

The plan is modest in scope, compared with past budget deals and to once-grand ambitions in Congress to craft a "grand bargain" to restructure the tax code and federal entitlement programs. But in a year and an institution characterized by gridlock, lawmakers were relieved they could reach even a minimal agreement.

"In divided government, you don't always get what you want," said Mr. Ryan.

Ms. Murray joined him in welcoming the prospect that lawmakers would steer away from a crisis-driven budget process. "We have lurched from crisis to crisis, from one cliff to the next," she said. "That uncertainty was devastating to our fragile economic recovery."

The deal, which goes to the House and Senate for approval in the coming days, marks a major change in the 2011 budget-cutting law, which set in motion 10 years of fiscal austerity, including across-the-board spending cuts known as sequestration.

The annual discretionary spending target will be raised to

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◆ Farm groups fight limits..... A6
◆ Pension-change pushback?... A8

Thousands Honor Memory of South Africa's Liberator



Associated Press

REST IN PEACE: A boy attended the memorial service for former South African President Nelson Mandela at a soccer stadium in Johannesburg on Tuesday that drew celebrities and dozens of heads of state, including President Obama, along with thousands of other mourners. **A12**

Longtime Insider Is GM's First Female CEO

By Jeff Bennett And Sara Murray

DETROIT—General Motors Co. tapped product chief Mary Barra as its next chief executive, smashing a century-old gender barrier while choosing a longtime insider who grew up steeped in Detroit's car culture.

Ms. Barra will succeed Dan Akerson as CEO next month and become the first woman to run a major global auto maker. The 51-year-old joined GM 33 years ago as a college intern, eventually becoming an engineering manager before running one of its big U.S. assembly plants. She got global experience managing human resources and, more recently, the company's world-wide product development group.

She will become the 22nd woman currently running a For-

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◆ Milestone is hailed, but women continue to face obstacles..... B7
◆ Heard on the Street..... C14

PARTY DISCIPLINE

China Spins New Lesson From Soviet Fall

By Jeremy Page

BEIJING—The Communist Party boss in eastern China's Jiangsu province summoned local officials recently to a compulsory study session. Their task was to watch a six-part documentary on the Soviet Union's collapse.

The film begins with images of the Soviet Union in its heyday, but quickly cuts to graphic footage of unrest in China's northern neighbor in the 1990s, set to ominous music and punctuated by Russian comments lamenting their nation's fate.

When the screening in Jiangsu ended, state media reported, local party chief Luo Zhijun exhorted the assembled officials to "correctly understand the lessons of history." The film's message: The Soviet Union didn't fall apart because of the communist system itself, but because of individuals who betrayed it, especially Mikhail Gorbachev.

The film is part of an ideological campaign launched by China's new leader, Xi Jinping, to re-energize the party and enforce discipline among its members. It has been shown at dozens of political meetings since September.

The frequent showings suggest Mr. Xi believes China needs to reinforce its Leninist political system rather than limit the party's powers. Party insiders and academics say it is part of an effort to combat what is portrayed as an American conspiracy to overthrow the party through "peaceful evolution"—the spread of Western ideas via media, academia and popular culture.

The office in charge of Mr. Xi's campaign didn't respond to questions about the film, called "20th Anniversary of the Death of the Soviet Party and State: As the Russians Relate," but said the campaign drew on experiences from China and the rest of the world.

The film, which was produced by a retired Chinese major general, has drawn criticism from some Chinese scholars of Soviet history, including some within the party. They argue that Moscow's mistake was to overlook deep flaws in the Soviet political and economic systems that emerged long before Mr. Gorbachev.

The film "lacks rational analysis, is mainly aimed at defending the Stalinist system and is illogical in many places," wrote Zuo Fen-

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Ukrainian Forces Confront Protesters



Reuters

Government security forces cracked down on protesters in Kiev hours after U.S. and EU diplomats called for a nonviolent resolution. **A13**

Bank Rule Challenges Wall Street

By Justin Baer And Julie Steinberg

A broad new government rule to limit risk-taking by Wall Street will force banks to rethink virtually every aspect of their trading activities, setting the stage for more tumult at the largest U.S. financial institutions.

The so-called Volcker rule, approved by five financial regulatory agencies on Tuesday, could lop as much as $10 billion total in yearly pretax profit from the eight largest U.S. banks through lower revenue and higher compliance costs, according to estimates from Standard & Poor's.

The 953-page edict, part of the 2010 Dodd-Frank financial overhaul, codifies and restricts the way banks trade securities. It curbs banks' ability to bet with their own capital and forces

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Here's Your Holiday Bonus, Now Start Running

Workers Win All-They-Can-Grab Sprees From Companies; 'Supermarket Sweep'

By Rachel Feintzeig

On Thursday, Alan Comley will get the holiday gift he never knew he always wanted: two minutes at a Texas Costco.

The 27-year-old wasn't even a member of the wholesale warehouse store until a few days ago. But his employer, coupon website RetailMeNot Inc., takes a cue from the game show "Supermarket Sweep" when it comes to rewarding employees. As a prize for his work as a software engineer, Mr. Comley will have 120 seconds to run unbridled through the big-box store's aisles, grabbing a plasma television, a videogame console and almost anything else that he can hoist onto his cart.

"I'm looking to break a record," he says.



At a time of year when many workers anticipate a Christmas bonus check or a holiday ham, some companies say one of the best ways to reward outstanding performance and inspire employee loyalty is a chance to shop 'til they drop.

Jordan, Nicholas, Elliott Inc., a Florida company that runs several restaurants, unleashes high performers on a Lakeland, Fla., Winn-Dixie, where they get two to four minutes to fill their carts as co-workers race alongside. Still other companies hit the mall—one gives workers $150 and an hour to buy what they like, while an Ohio health-care system awards 20-year employees a $300 trip to a shopping center, after which they strut down a

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Yves

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BUSINESS SUMMARY

Apple Inc. designs, manufactures and markets mobile communication and media devices, personal computers and portable digital music players. The Company sells a range of related software, services, accessories, networking solutions, and third-party digital content and applications. The Company's segments include the Americas, Europe, Greater China, Japan and Rest of Asia Pacific. The Americas segment includes both North and South America. The Europe segment includes European countries, India, the Middle East and Africa. The Greater China segment includes China, Hong Kong and Taiwan. The Rest of Asia Pacific segment includes Australia and the Asian countries not included in the Company's other operating segments. Its products and services include iPhone, iPad, Mac, iPod, Apple Watch, Apple TV, a portfolio of consumer and professional software applications, iPhone OS (iOS), OS X and watchOS operating systems, iCloud, Apple Pay and a range of accessory, service and support offerings.

NEWS

28-Dec-2016		
10:24:36	Apple dominerade julhandeln mätt i antalet aktiverade enheter	FNW
10:15:18	UPDATE 3-S.Korea fines Qualcomm $854 mln for violating competition laws	RTRS
09:42:52	Corea del Sur multa a Qualcomm con 854 mlns dlr por violar leyes de competencia	RTRS
06:00:10	RPT-Wall Street cale une fois de plus au seuil des 20.000 points	RTRS
03:30:18	Aumento del gasto de último minuto impulsa a temporada de ventas de fin de año ...	RTRS
01:50:14	Last-minute spending surge lifts U.S. holiday shopping season	RTRS
27-Dec-2016		
23:33:16	Reuters Insider - Tech stocks could take the Dow to 20k	CNBC
23:32:28	Reuters Insider - History suggests Dow could hit 20k by Friday: Technician	CNBC
22:55:29	LEAD 2-Wall Street cale une fois de plus au seuil des 20.000 points	RTRS
22:09:39	Apple, Cisco Lead DJIA Higher Tuesday	WALLST

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NTS	Q1 2017 Apple Inc Earnings Release
24-Feb-2017 » 28-Feb-2017	

PRICE PERFORMANCE

Open	
Prev. Close	
Bid / Ask	
VWAP	--
Turnover	
Volume	
Short Interest	0.90%
YTD	
Beta (5Y Monthly)	1.29
Mkt Cap	USD 625.27B
PE (LTM)	14.12
Div Yield	1.94%
DR	BRL AAPL34.SA (1:0.1)
DR Type	--
DR Bank	--



Today | 5D | 3M | 6M | 1Y | 5Y | No Benchmark

52Wk: 89.47 (12-May) — 118.69 (11-Oct)

Next Earn Report: 24-Jan-2017

Free Float	5.32B	Asset Type	Ordinary Share	5 yr CDS	26.980 bps
Outstanding	5.33B	Share Class	--	Δ Today	-0.07%
IPO Date	12-Dec-1980	Lot Size		Δ 1 Week	-0.074
First Trade Da...	12-Dec-1980	Voting Rights	1		

FUNDAMENTALS

	AAPL (Sep-2016)	Growth	Industry
Gross Margin	38.02%	(4.71%) 4Q	38.91%
Operating Margin	25.10%	(11.59%) 4Q	5.75%

Tick Data

In [23]:
```
tick = ek.get_timeseries(['AAPL.O'],
                         fields='*',
                         start_date='2017-07-11 16:00:0000',
                         end_date='2017-07-11 16:15:0000',
                         interval='tick')
```

In [24]:
```
tick.info()
```

```
<class 'pandas.core.frame.DataFrame'>
DatetimeIndex: 1898 entries, 2017-07-11 16:00:00.686000 to 2017-07-11 16:14:59.708000
Data columns (total 2 columns):
VALUE     1892 non-null float64
VOLUME    1898 non-null float64
dtypes: float64(2)
memory usage: 44.5 KB
```

In [25]:
```
tick.tail()
```

Out[25]:

AAPL.O	VALUE	VOLUME
Date		
2017-07-11 16:14:59.693	144.9900	100.0
2017-07-11 16:14:59.693	144.9900	100.0
2017-07-11 16:14:59.693	144.9900	100.0
2017-07-11 16:14:59.707	144.9899	400.0
2017-07-11 16:14:59.708	144.9899	1305.0

News

In [29]:
```
news = ek.get_news_headlines('R:.SPX AND "Trump" AND Language:LEN', count=5)
news
```

Out[29]:

	versionCreated	text	storyId	sourceCode
2017-08-18 16:46:19	2017-08-18 16:46:19	U.S. STOCKS EXTEND GAINS AFTER NEW YORK TIMES ...	urn:newsml:reuters.com:20170818:nL4N1L44L9:1	NS:RTRS
2017-08-18 15:53:08	2017-08-18 15:53:08	CORRECTED-U.S. STOCKS PARE LOSSES, TRADERS CIT...	urn:newsml:reuters.com:20170818:nL4N1L44IK:1	NS:RTRS
2017-08-18 15:16:27	2017-08-18 15:16:27	US STOCKS-Wall St lower on growing concerns ov...	urn:newsml:reuters.com:20170818:nL4N1L44F2:5	NS:RTRS
2017-08-18 11:24:30	2017-08-18 11:24:30	US STOCKS-Futures flat amid growing concerns o...	urn:newsml:reuters.com:20170818:nL4N1L43RR:5	NS:RTRS
2017-08-17 17:09:05	2017-08-17 17:09:05	US STOCKS-Wall St extends losses on Trump poli...	urn:newsml:reuters.com:20170817:nL4N1L34N1:5	NS:RTRS

In [30]:
```
storyId = news.iloc[4, 2]
storyId
```

Out[30]:
```
'urn:newsml:reuters.com:20170817:nL4N1L34N1:5'
```

In [31]:
```
from IPython.display import display, HTML
```

In [32]:
```
display(HTML(ek.get_news_story(storyId)))
```

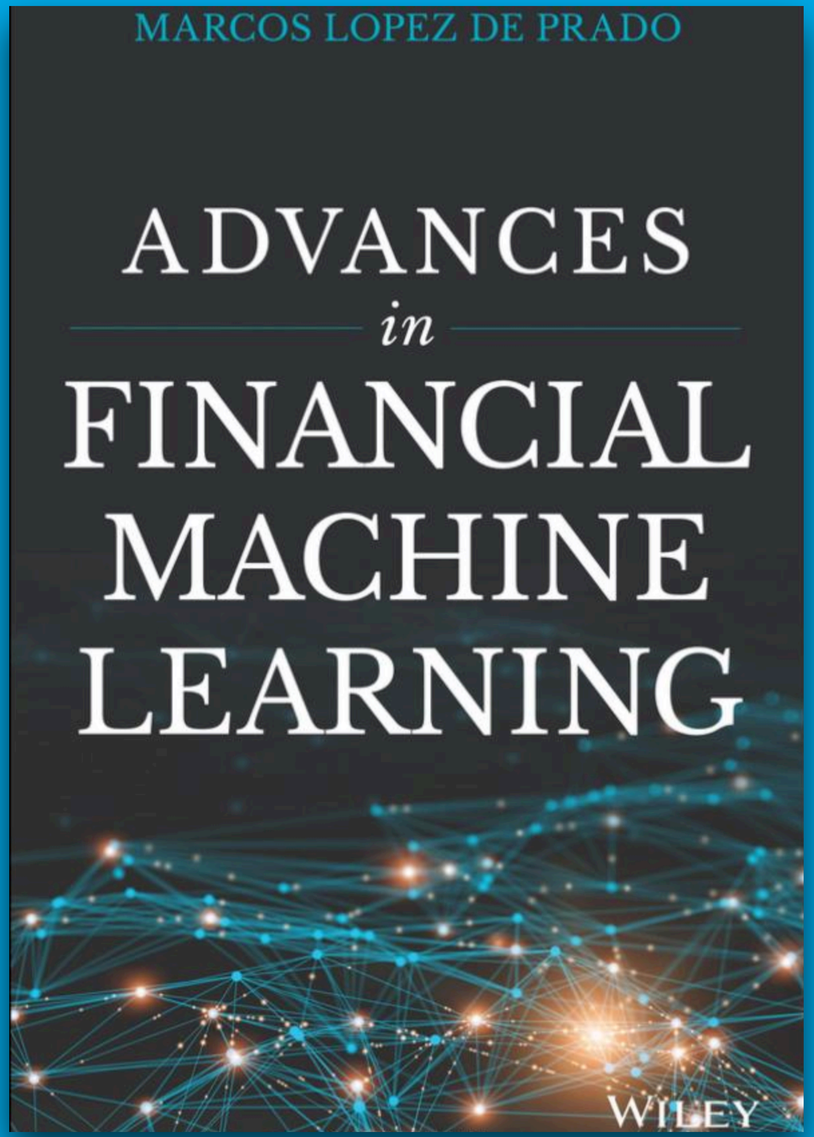
- Gary Cohn resignation rumors knocked down
- Wal-Mart drops after reporting margin fall
- Indexes down: Dow 0.81 pct, S&P 1.03 pct, Nasdaq 1.39 pct

Updates to early afternoon

By Sruthi Shankar and Tanya Agrawal

Aug 17 (Reuters) - U.S stocks hit session lows in early afternoon trading on Thursday as investors worried about President Donald Trump's ability to

AI-First Finance



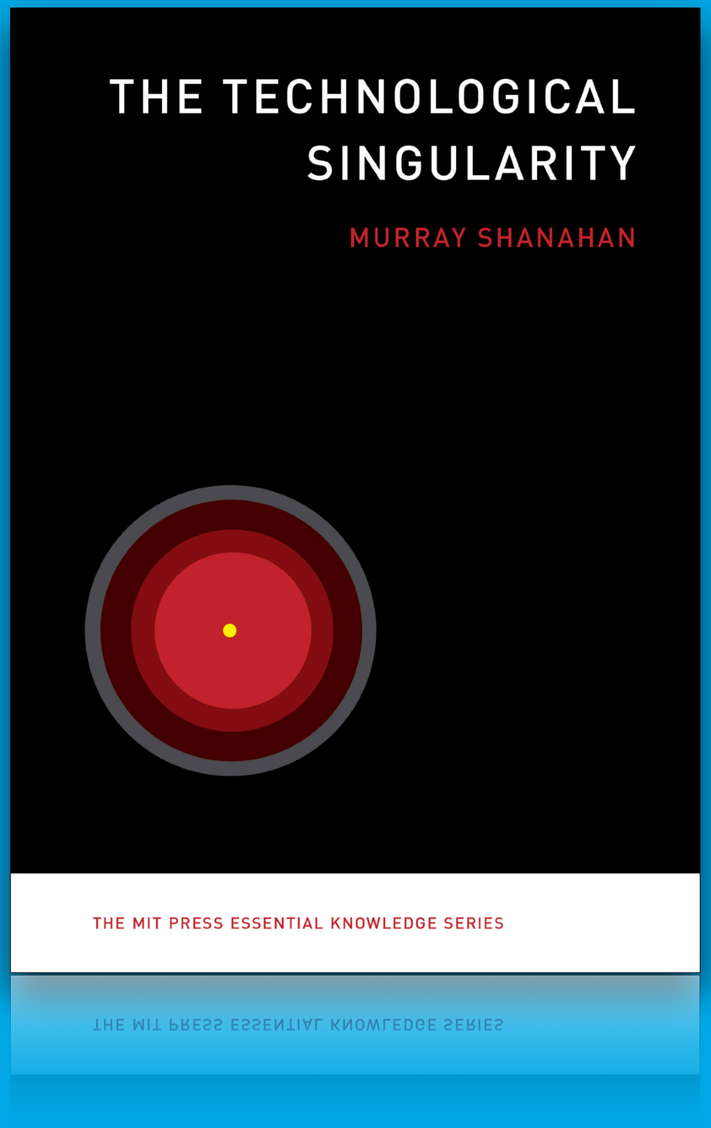
"The essential tool of econometrics is multivariate linear regression, an 18th-century technology that was already mastered by Gauss before 1794 … It is hard to believe that something as complex as 21st-century finance could be grasped by something as simple as inverting a covariance matrix."

"… what if economists finally started to consider non-linear functions?"

"An ML algorithm can spot patterns in a 100-dimensional world as easily as in our familiar 3-dimensional one."

"Econometrics might be good enough to succeed in financial academia (for now), but succeeding in practice requires ML."

Marcos López de Prado (2018)



"Today's algorithmic trading programs are relatively simple and make only limited use of AI. However, this is sure to change. Artificial intelligence is beneficial in any domain where patterns have to be found in large quantities of data and effective decisions have to be taken on the basis of those patterns, especially when the decisions have to be taken rapidly."

Murray Shanahan (2015)

Bullish patterns (going up)



Flag



Pennant



Cup with handle



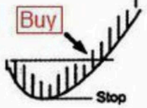
Ascending triangle



Symetrical triangle



Measured move up



Ascending scallop



3 rising valleys

Bearish patterns (going down)



Flag



Pennant



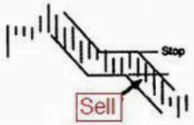
Invertede Cup with handle



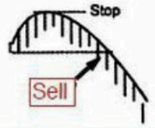
Descending triangle



Symetrical triangle



Measured move down



Descending scallop



3 descending peaks

Reversal patterns



Double bottoms



Diamond bottoms



Tops rectangle



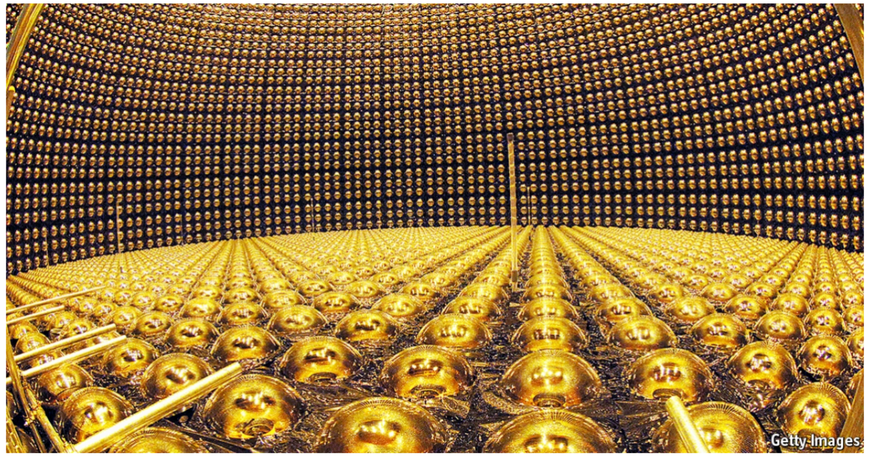
Head and shoulders top

Particle physics

Fundamental physics is frustrating physicists

The Economist

No GUTs, no glory



Print edition | Science and technology ›
Jan 13th 2018

DEEP in a disused zinc mine in Japan, 50,000 tonnes of purified water held in a vast cylindrical stainless-steel tank are quietly killing theories long cherished by physicists. Since 1996, the photomultiplier-tube detectors (pictured above) at Super-Kamiokande, an experiment under way a

The beauty myth

One such is Sabine Hossenfelder of the Frankfurt Institute for Advanced Studies, in Germany. She argues that the appeal of GUTs, supersymmetry and the like rests on their ability to explain "numerological coincidences" that do not need to be explained. Perhaps, to take one example, the universe simply started out with more matter than antimatter in it, rather than this being a consequence of its subsequent evolution. As she points out, no theory precludes this possibility—it is just that it is not very elegant. Similarly, she says, "It's not like anybody actually needs supersymmetry to explain anything. It's an idea widely praised for its aesthetic appeal. Well, that's nice, but it's not science."

Financial Markets

x



y

“non-linear, complex, changing”

Finance History



f(•)

f(x) ≠ y

“brain-driven & beauty myth”

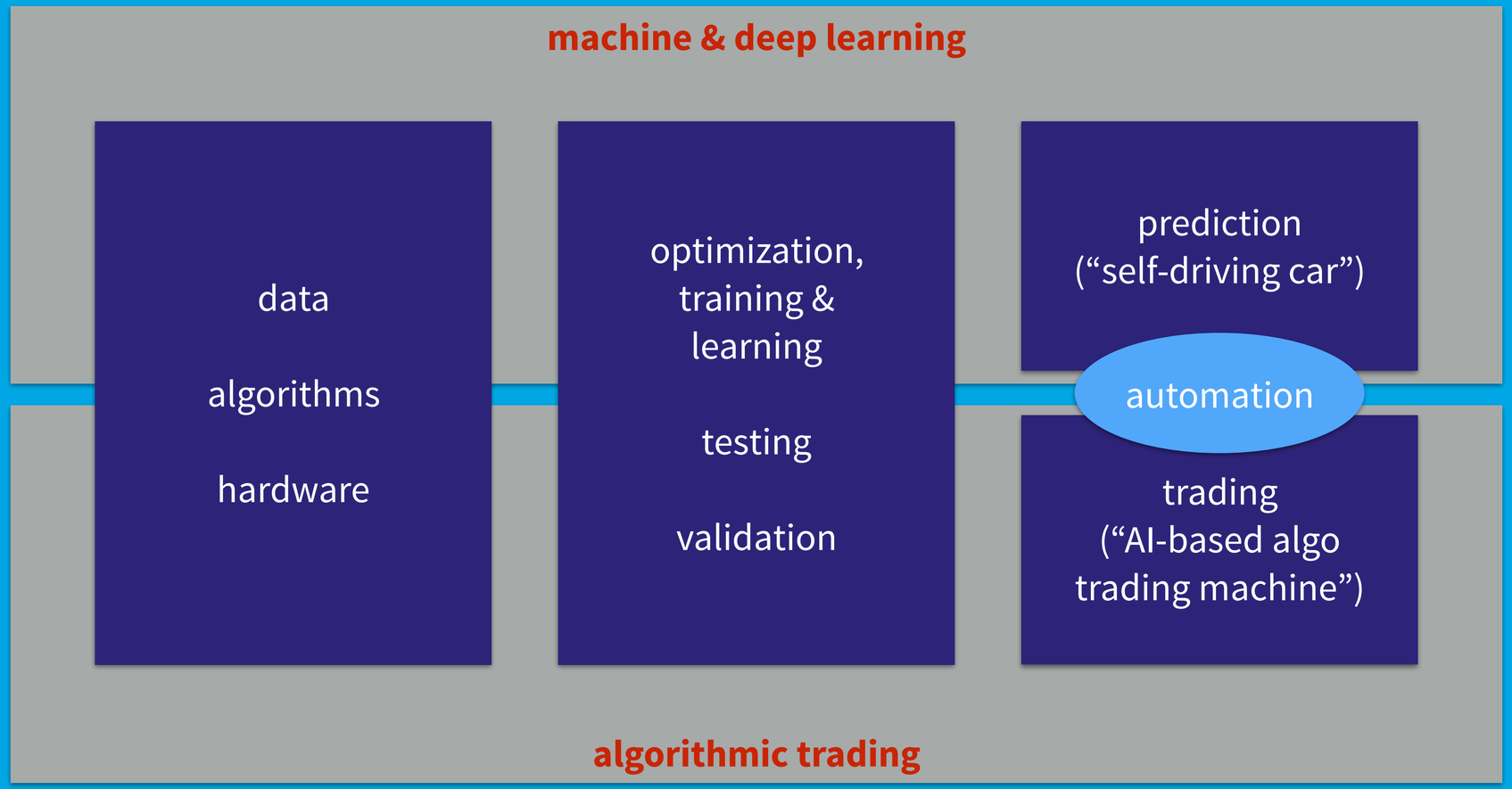
AI in Finance = finaince

x

m(•, a, b)

m(x, a*, b*) ≈ y

“data-driven & AI-first”


machine & deep learning
data
algorithms
hardware
optimization,
training &
learning
testing
validation
prediction
(“self-driving car”)
automation
trading
(“AI-based algo
trading machine”)
algorithmic trading

Example Strategy

STRATEGY IDEA

- **instruments:** single instrument (FX), leveraged
- **positions:** long and short
- **financial data:** mid-frequency (5 or 10 mins)
- **algorithm:** classification (Bayes, LR, LR and similar)
- **goal:** alpha = outperformance + positive return + low correlation
- **robustness**: acceptable performance independent of parameters
- **programming:** Python, NumPy, pandas, scikit-learn



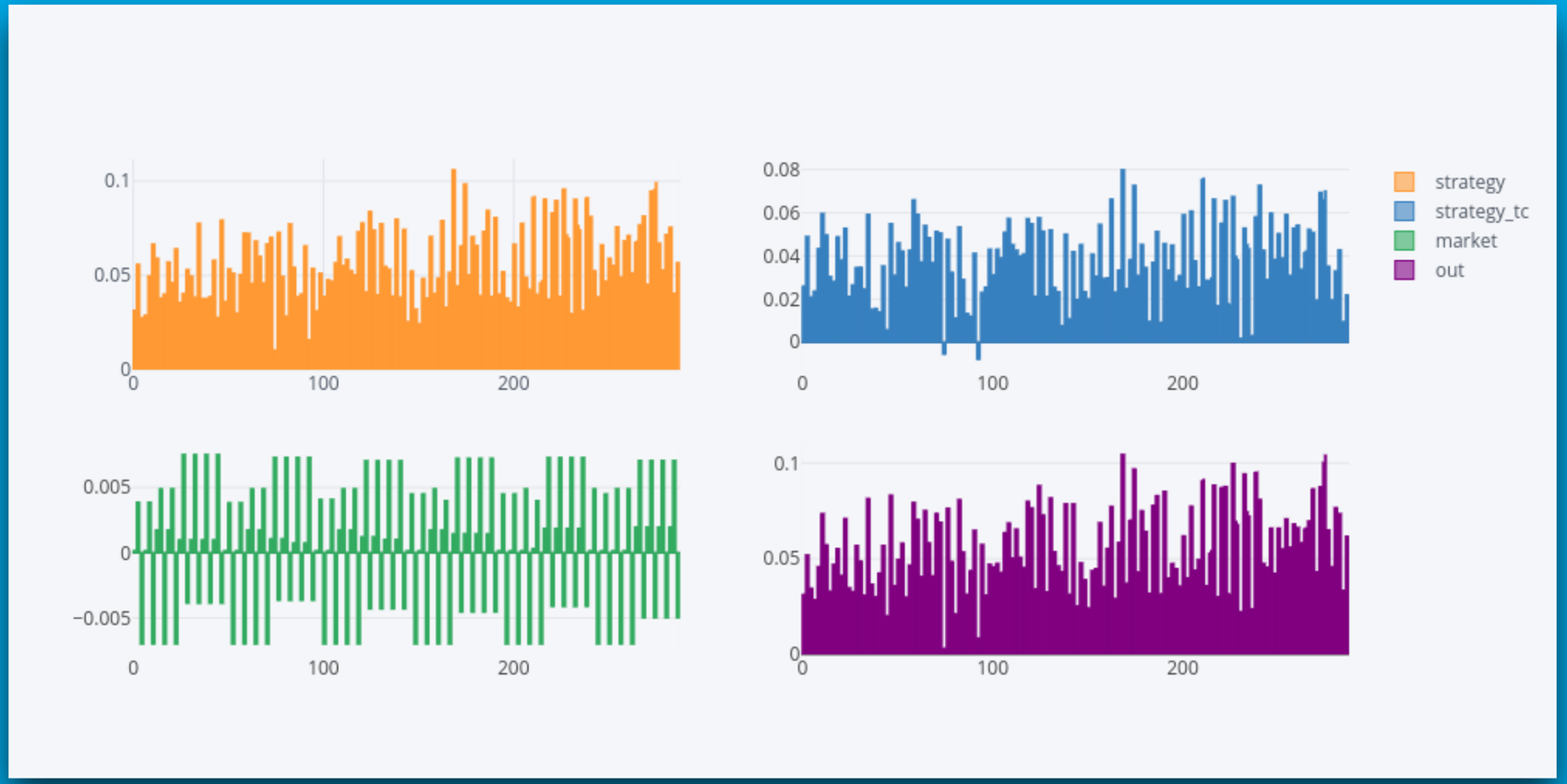
PARAMETERS

- EUR_USD, 5min bars
- sequential training/backtest
- 40% to 60% train-test split



PARAMETERS

- EUR_USD, 5min bars
- randomized training/backtest
- 40% to 60% train-test split



PARAMETERS

- EUR_USD, 10min bars
- randomized training/backtest
- 40% to 60% train-test split
- 288 algorithm configurations



PARAMETERS

- EUR_USD, 10min bars
- randomized training/backtest
- 40% to 60% train-test split
- 288 algorithm configurations

The AI Machine

A bit of background and some general thoughts

- On the way from The Python Quant to The AI Quant …
- “Do you trade? Do you do algo trading on your own?”
- Many people fail deploying their algo trading ideas
- Walk the talk … and come up with a proof-of-concept
- Robust, reliable execution as a condition sine qua non
- Fascination for markets and betting — getting direct feedback

16 week program

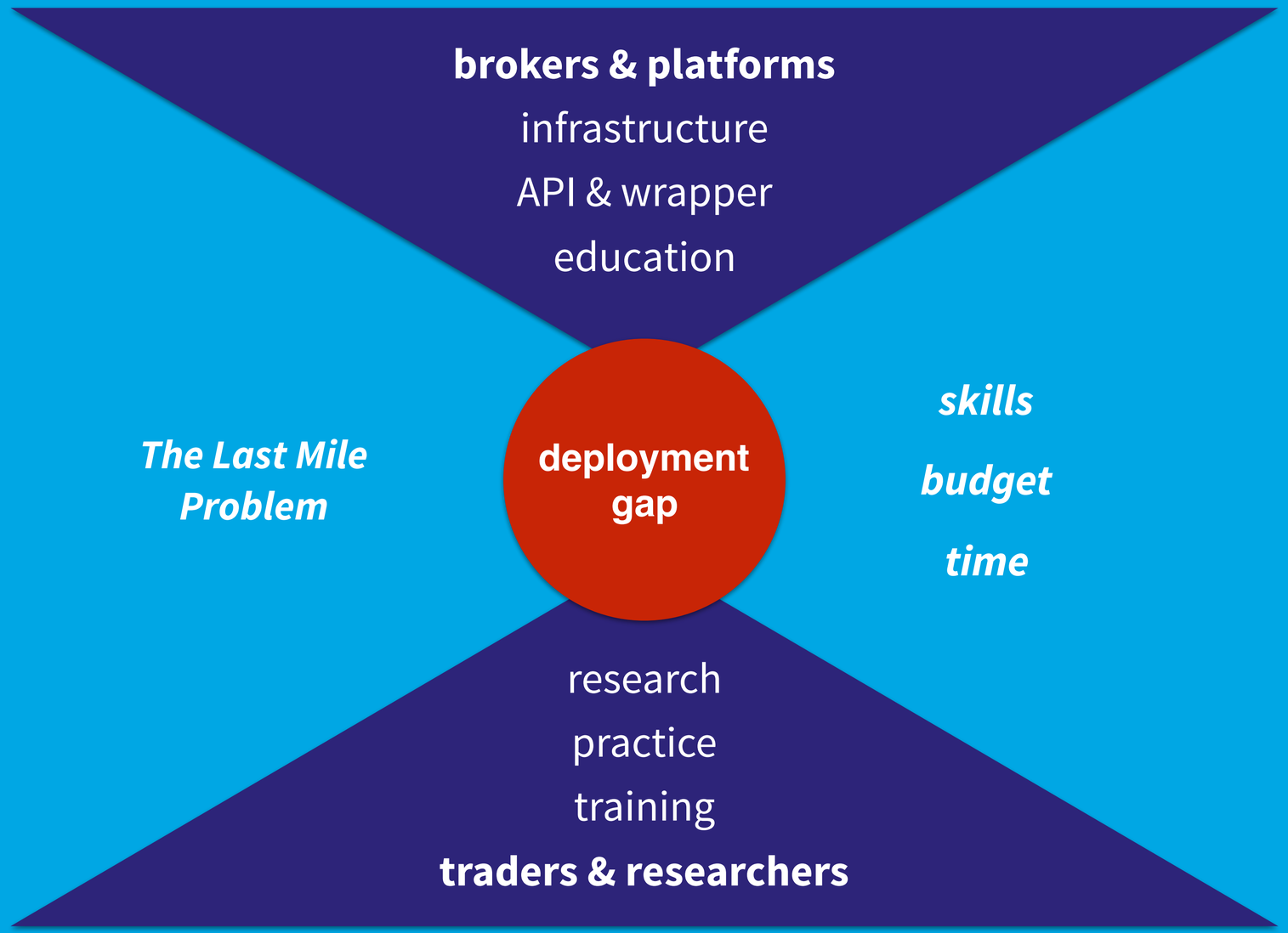
150+ hours of instruction



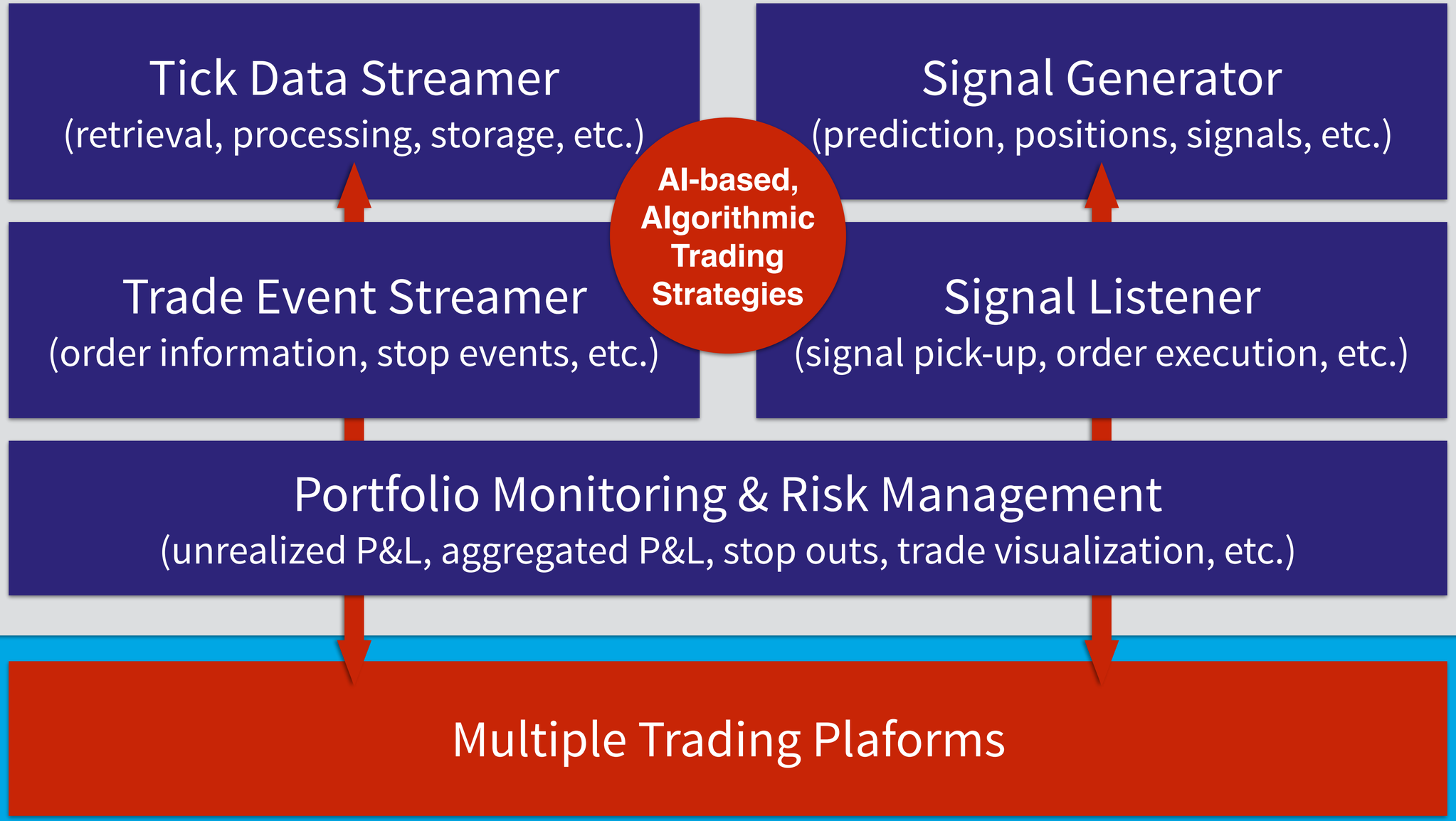
5,000+ lines of code

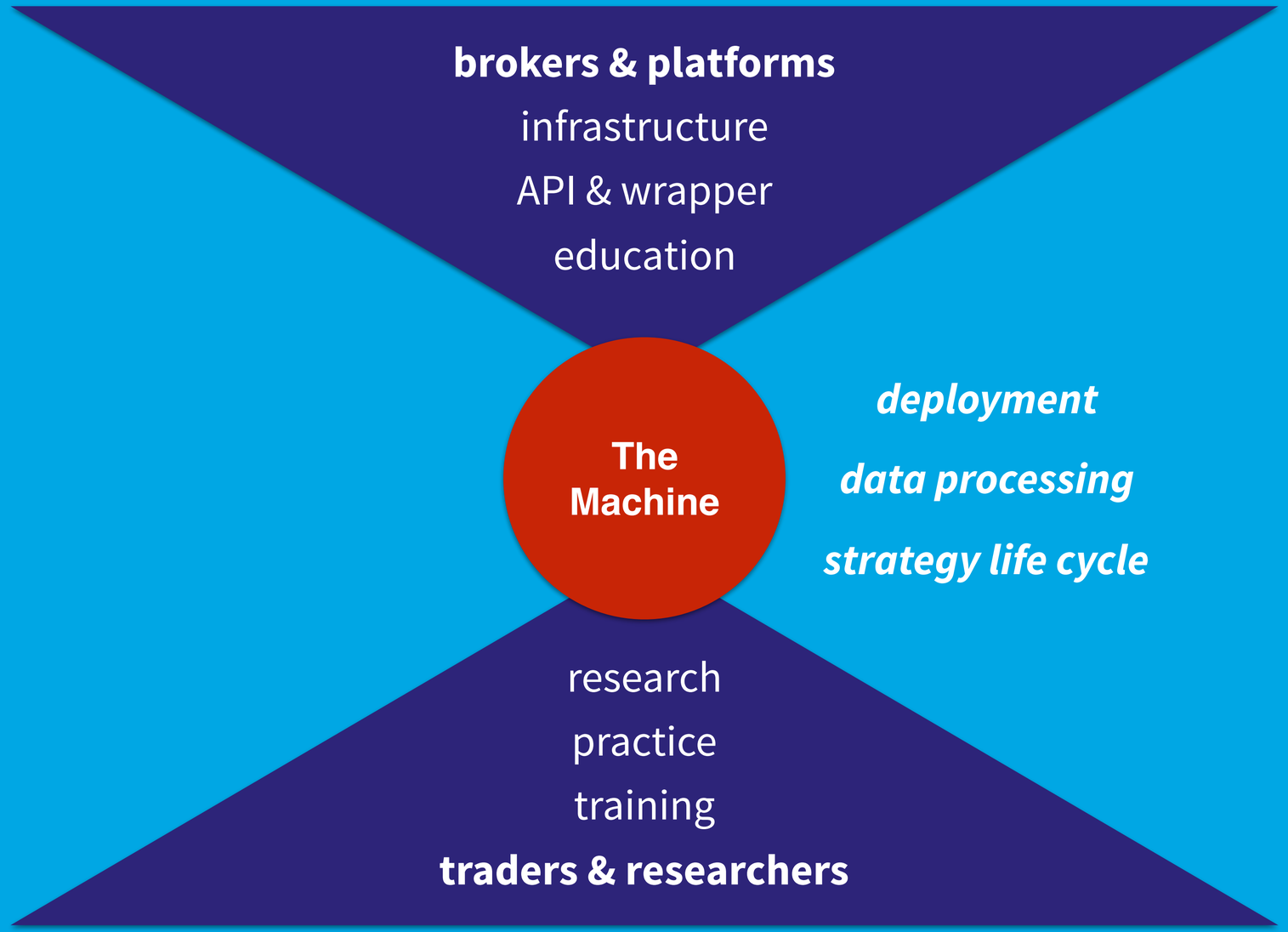
1,200 pages PDF

http://certificate.tpq.io


brokers & platforms
infrastructure
API & wrapper
education
The Last Mile Problem
deployment gap
skills
budget
time
research
practice
training
traders & researchers

The AI Machine




brokers & platforms
infrastructure
API & wrapper
education
The Machine
deployment
data processing
strategy life cycle
research
practice
training
traders & researchers

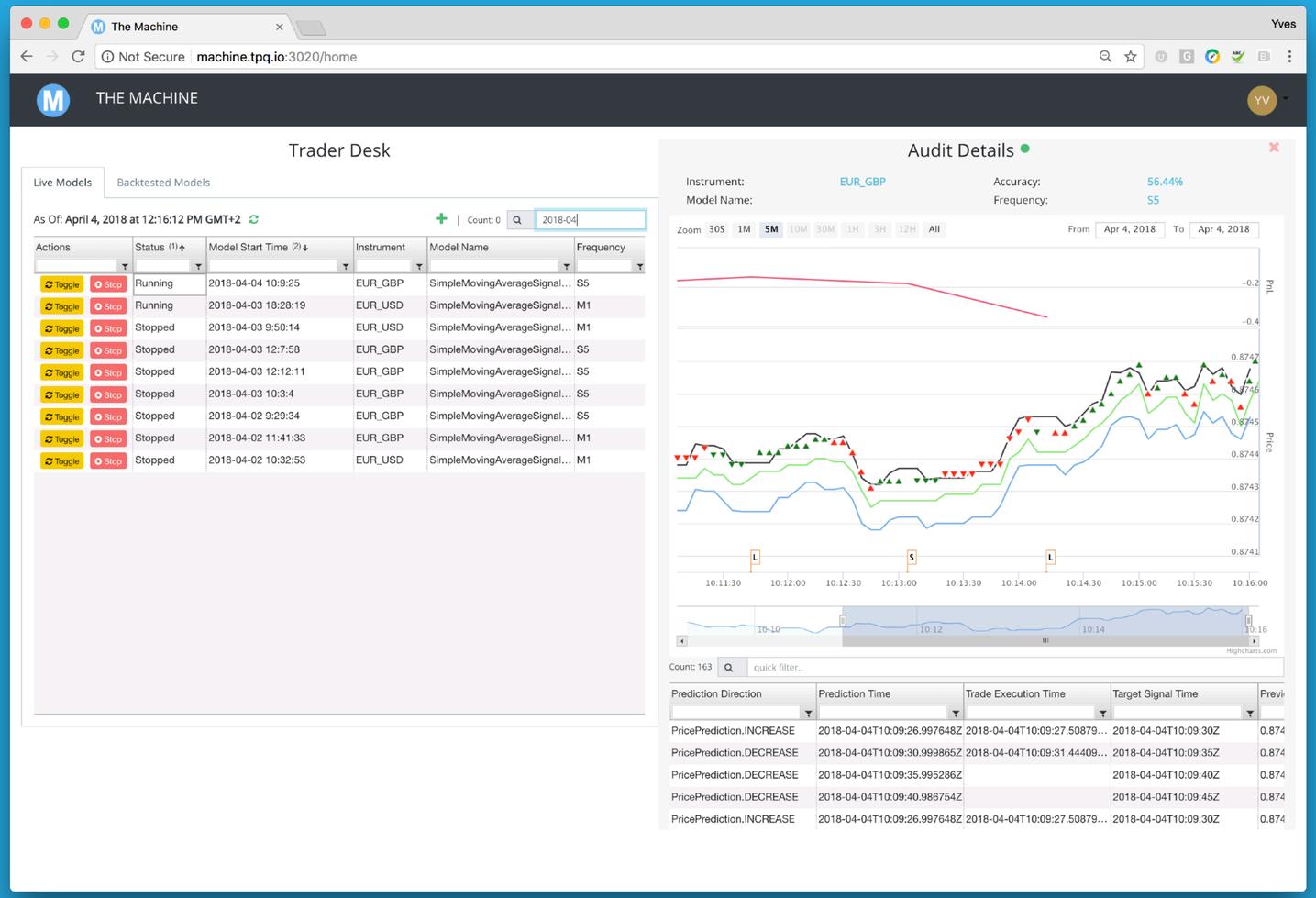


AI-based, Algorithmic Trading Strategies

The AI Machine

The AI Machine

standardized deployment of AI-based algorithmic trading strategies



INDUSTRIAL CHAIN

- **data sources:** platforms (Oanda, FXCM) and TR Eikon Data API
- **feature analysis:** any time series based features that are helpful
- **strategies:** long only, long and short
- **backtesting:** sequential, randomized, robust configuration
- **deployment:** The AI Machine, full automation, audit, report
- **portfolio oversight**: multiple configurations for multiple FX pairs & CFDs

Skynet begins to learn at a geometric rate.
It becomes self-aware at 2:14 a.m. Eastern time, August 29th.

—The Terminator (Terminator 2)

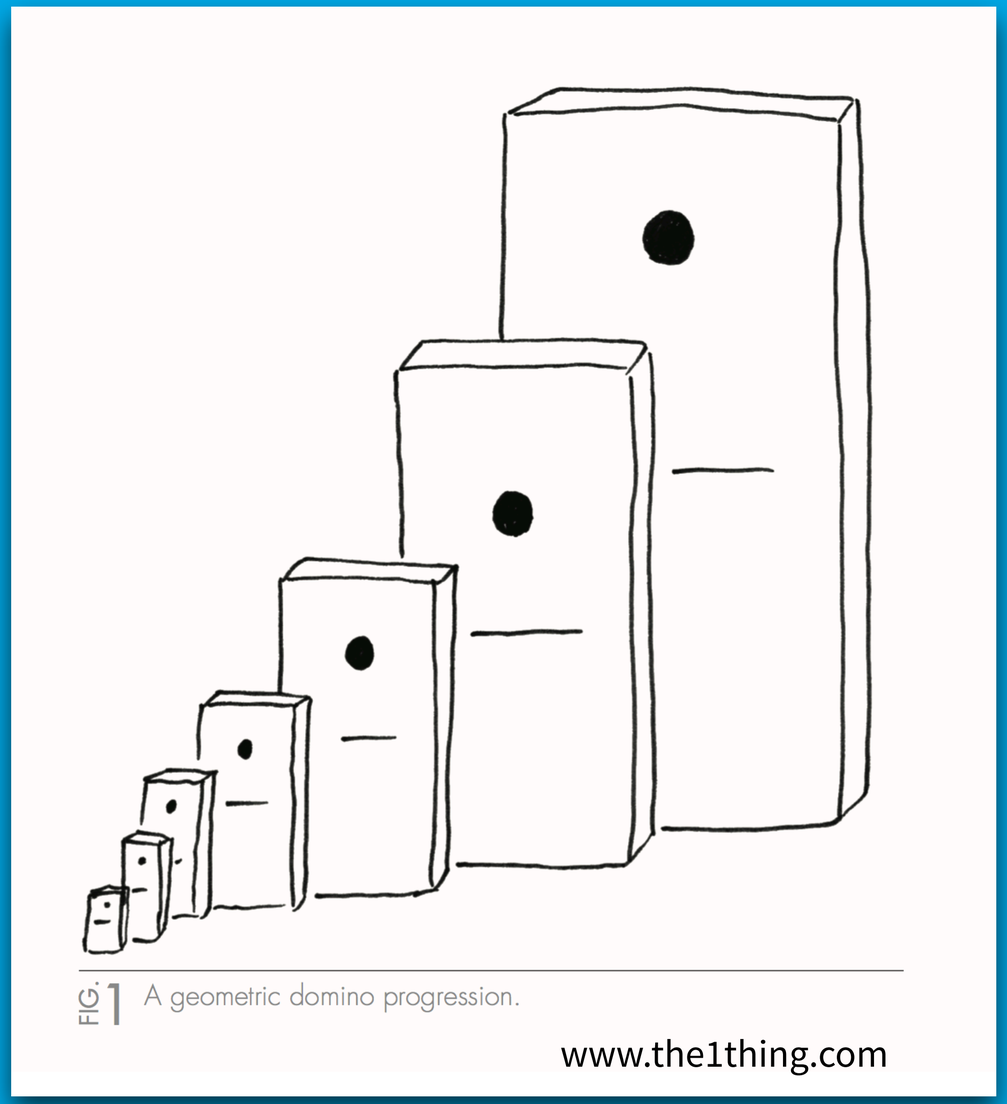
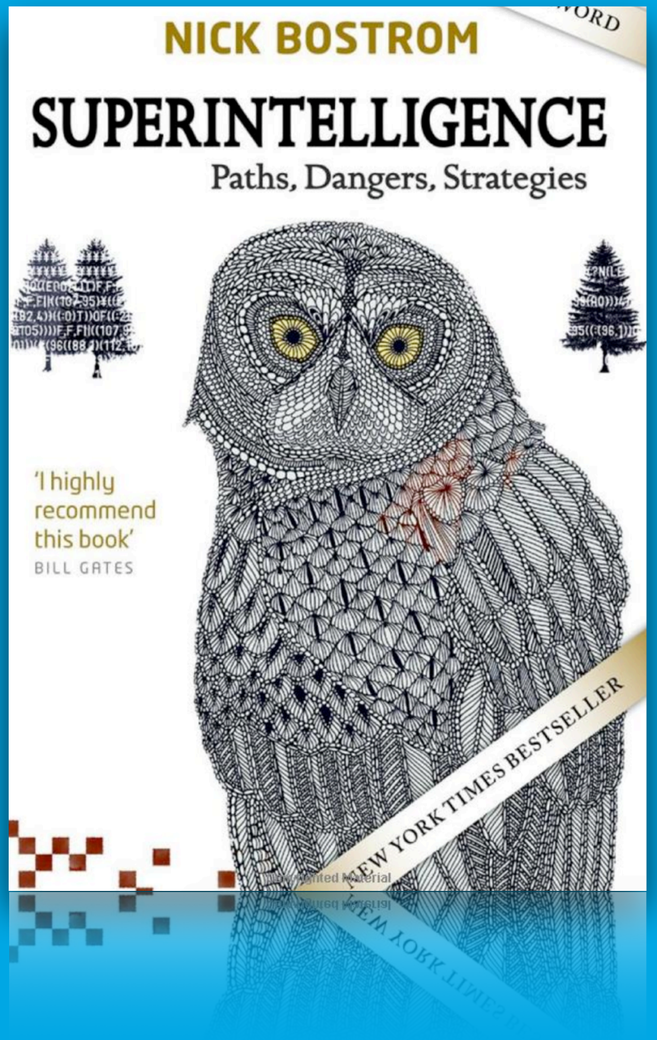


FIG 1 A geometric domino progression.

www.the1thing.com

exponential forces at work:

- technology improvements
- capital accumulation
- talent accumulation



"Go-playing programs have been improving at a rate of about 1 dan/year in recent years. If this rate of improvement continues, they might beat the human world champion in about a decade."

Nick Bostrom (2014): Superintelligence.

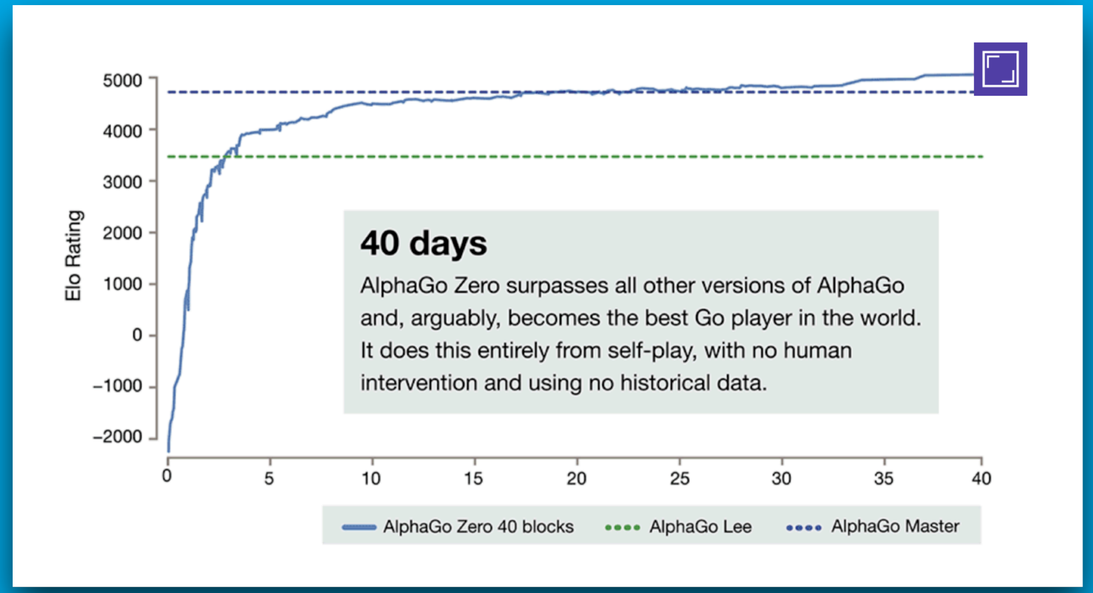
The story of AlphaGo so far

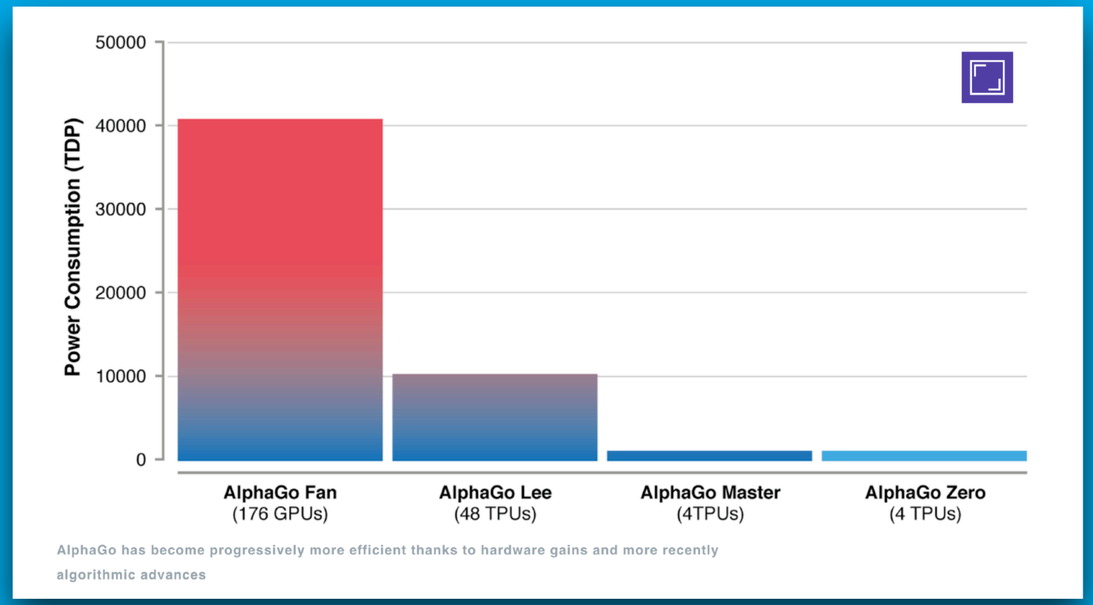
AlphaGo is the first computer program to defeat a professional human Go player, the first program to defeat a Go world champion, and arguably the strongest Go player in history.

AlphaGo's first formal match was against the reigning 3-times European Champion, Mr Fan Hui, in October 2015. Its 5-0 win was the first ever against a Go professional, and the results were published in full technical detail in the international journal, **Nature**. AlphaGo then went on to compete against legendary player Mr Lee Sedol, winner of 18 world titles and widely considered to be the greatest player of the past decade.

AlphaGo's 4-1 victory in Seoul, South Korea, in March 2016 was watched by over 200 million people worldwide. It was a landmark achievement that experts agreed was a decade ahead of its time, and earned AlphaGo a 9 dan professional ranking (the highest certification) - the first time a computer Go player had ever received the accolade.

During the games, AlphaGo played a handful of **highly inventive winning moves,** several of which - including move 37 in game two - were so surprising they overturned hundreds of years of received wisdom, and have since been examined extensively by players of all levels. In the course of winning, AlphaGo somehow taught the world completely new knowledge about perhaps the most studied and contemplated game in history.





AlphaGo has become progressively more efficient thanks to hardware gains and more recently algorithmic advances

The Python Quants GmbH

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@dyjh

