Algorithmic Trading with Machine Learning & Deep Learning





Dr. Yves J. Hilpisch

http://bit.ly/odsc_ldn_2018

Introduction



TRAINING

about Python for finance & algorithmic trading

PLATFORM

for browser-based data analytics

for financial analytics

EVENTS for Python quants & algorithmic traders **W**THE PYTHON QUANTS CERTIFICATION QUANTS in cooperation with university BOOKS about Python and finance **OPEN SOURCE** Python library

http://tpq.io



http://hilpisch.com

Wiley Finance Series

Derivatives Analytics with

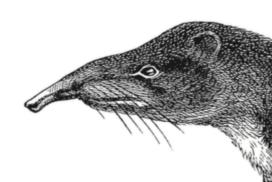
Python

Data Analysis, Models, Simulation, Calibration and Hedging

YVES HILPISCH

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MASTERING DATA-DRIVEN FINANCE

for Finance

Yves Hilpisch

Phot Edition

Wiley Finance Series

Listed Volatility and Variance erivatives

A Python-based Guide

YVES HILPISCH

http://books.tpq.io



Banking **Outlook**

FEBRUARY, 2017

BANKINGCIOOUTLOOK.COM

Top 10 Banking Analytics Solution Provi

oday's data-driven banking industry portrays a scenario banks are leveraging analytics to where analytics is paving a productive path for banks, by offering meaningful insights on their underlying data. Although basic reporting and descriptive analytics are prevalent in the banking sector, the need of the hour is advanced predictive and prescriptive analytics.

Sophisticated technologies-like the emerging cognitive analytics for instance-are enabling banks to make better decisions and achieve profitable growth quarter-on-quarter. At the same time, with enhanced visibility into intricate information, such as individual financial health and behavioral patterns, banks has selected top players from the now have the upper hand in risk mitigation and fraud prevention that help them comply with mandatory regulations.

With the Blockchain gaining mainstream attraction, digital currencies such as Bitcoin and Ethereum are doing their rounds among consumers for payments and other transactions. To that end, Analytics Solution Providers 20

these digital currencies, by veri with an unprecedented level of

Identifying the numerous b constant quest to find solutions in a timely and accurate manner whole new level.

To help CIOs and CFOs solution provider, a distinguis CFOs, VCs, analysts, and the Ba demonstrate an ability to deve

outstanding customer service. We present to you Banking

Managing Partner

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An annual listing of 10 companies that are at the forefront of providing banking analytics solutions and impacting the marketplace

The Python Quants GmbH
recognized by Outlook magazine as
TOP 10 Banking Analytics
nual listing of 10 companies that are at the forefront of providing anking analytics solutions and impacting the marketplace

The Python Quants Group	Focused on Python and Open Technologies for Financial Da Algorithmic Trading and Com Finance
Key Person: Dr. Yves J. Hilpisch	Website:

tpq.io



The Python Quants Group **Enhance Financial Analytics**

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available for Python has our Quant Platform." grown rapidly and has finally made it

The Python Quants GmbH





individuals to do financial and data cycles. "We support financial institutions risks," adds Hilpisch. in introducing, training and deploying

ver the years, the ecosystem experience with Python for Finance and f scientific, numerical and provide a hands-on learning experience, analytics packages making heavy use, for instance, also of

The company's Quant Platform makes central, standardized Python ts have deployment an easy and efficient affair while mitigating risks and reducing 1 rather maintenance costs considerably during deployment. Based on modern web technologies and deployment techniques before like Docker containers, the Quant ing and Platform provides a full-fledged suite of analytics development tools via the web browser without the need to install any kind of open source software locally on desktop or notebook computers.

leading derivatives exchanges, wanted derivatives, portfolio and risk analytics to support investors, traders, market makers and quants in the understanding it makes heavy use of the capabilities ignore and trading of their listed volatility of Python and the capabilities of its and variance products. Eurex decided or open to use Python for this project and it there The Python Quants were tasked to create the content and in particular the Python Python codes accompanying it. While omes to the content itself became part of the oyment, Eurex website, all Python codes were provided to Eurex partners and other interested parties on a Eurex-labeled version of the Quant Platform for easy code access and execution. "Deploying open source technologies, like Python, analytics in real-time and on a highly is often a tedious and sometimes even customized basis as well as to rapidly a risky process, with our services and develop new financial applications and products we help our clients to make deploy them based on weekly or even daily this process more efficient and mitigate on machine and deep learning techniques,

Python and a major building block in Quants Group assisting organizations to blockchain. "We will improve our value this regard is our Quant Platform," model, price and risk manage complex proposition in particular for hedge funds adds Hilpisch. "Our training offerings portfolios of (multi-risk) derivatives with and other buy side players for the days to are based on more than 10 years of potentially complex correlation structures come," concludes Hilpisch. BC

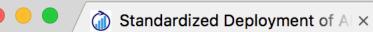


In an instance, Eurex, one of the is DX Analytics. Being an open source library written exclusively in Pythonnumerical and data analytics libraries.

Our major focus has always been on the use of Python and open source technologies for financial data science, computational finance and algorithmic trading

As the Python ecosystem sees tremendous momentum, The Python Quants Group's near-term focus will be technologies emerging in algorithmic Another product of The Python trading as well as on cryptocurrencies and

http://hilpisch.com/bcioo_tpq.pdf



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Yves

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Data-Driven Finance

FINANCIAL TIMES

Iohamed El-Erian

Torturing Theresa

<u>Confined in a circle</u>

Las Vegas reels from worst US mass shooting

A casualty is carried from the scenafter 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

ed shots from his 32nd-floor room i the Mandalay Bay Hotel and Casino i he crowd of 22,000 people attending In televised remarks, Donald Trump, the US president, called the shooting

"an act of pure evil" but made no refe enceto guns. He plans to visit the city on Wednesday to meet the families of the victims and law enforcement officials.



Catalan president urges Brussels to mediate in independence clash

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

Report > PAGE 4

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CLIVE COOKSON – SCIENCE EDITOR
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 Juleen Zeitarth of the Nobel Assembly the statistic transmarks in the synchronises of the proper importance of steps and wakeful the statistic transmarks and the importance of really making certain we allow ourselves to pose the second the important transmarks and the importance of really making certain we allow ourselves to pose the second the importance of really making certain we allow ourselves to pose the second the implications for our health and wellbeing."

STOCK MARKETS				CURRENO	CIES					INTERESTRATES			
	Oct 2	prev	%dig		Oct 2	prev		Oct 2	prev		price	yield	
S&F 500	2522.54	2519.36	D.13	S pur €	1.174	1,182	E per \$	0.852	D.846	US Gov 1D yr	99.31	2.33	
Nasdaq Composite	6491.42	6495.96	-0.07	\$ per £	1.327	1.342	E per \$	0.753	D.745	UK Gov 10 yr	98.98	1.36	
Dow Jones Ind	22480.23	22405.09	0.34	fper€	0.884	0.981	€perf	1.131	1,135	Ger Gov 10 yr	100.48	0.45	
FTSEurofirst 300	1532.50	1524,79	D.51	¥per\$	112,710	112.565	¥per€	132.276	133.074	Jpn Gov 1D yr	100.34	D.07	
Euro Stow 50	3569.02	3594.85	D.12	¥ per £	149.612	151.023	£ index	78.309	78.630	US Gov 3D yr	97.87	2.85	
FTSE 100	7438.84	7372.76	0.90	€index	94.204	93.905	Sindex	99.385	99.438	Ser Gov 2 yr	101.97	-D.71	
FTSE All-Share	4082.95	4049.89	0.82	Shi per C	1.142	1,144	SFr per E	1,292	1,298	3	price	prev	
CAC 40	5350.44	5329.81	0.39	COMMOD	TIES					Fed Funds Eff	1.07	1.07	
Xetra Dax	12902.65	12828.86	0.58				Oct Z	prev	Sichg	US 3m Bills	1.06	1.06	
Nikkei	20400.7B	20356.28	D.22	QI WTI\$		E	50.48	51.67	-2.30	Euro Libor 3m	-0.38	-0.38	
Hang Song	27554.30	27421,60	D.48	Oil Brent \$	1	Ę	56.05	56.79	-1.30	UK 3m	0.34	D.33	
FTSE All World \$	321.95	321.86	0.09	Gold \$		127	73.70	1283.10	-0.73	Prices are fatest for edition	Data pro	sided by Ma	ant

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Brussels calls for battery development consortium

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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 bility to restage its election this month.- PAGE 4





Equifax defends silence over hack

▶ Puerto Rico calls for billions in aid

of dollars in aid from the US as it struggles to recover after Hurricane Maria .- PAGE 2

▶ Portugal's Socialists reap benefits

▶ Uber's UK head quits as chief flies in

Raúl Maldonado Gautier, Puerto Rico's treasury secretary, says the island will need "tens of billion:

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

▶ 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 16

Datawatch





US manufacturing Above 50 = growth

60 US manufacturing 50 activity as 45 institute 50 support 45 institute 50 support 45 institute 50 support 46 institute 50 support 46 institute 50 support 47 institute 50 support 48 institute 50 support 50 50

02 05 10 15 17 since the summer of 2004

MICHAEL STOTMARD – BARCELONA IMMOUNT – GIRONA The Catalan government said it wanted to avoid a "traumatic split" from Spain and arb dealer three but models with the Spanish state." Breakled: "We don't want a traumatic and appealed to the EU to mediate with to avoid a "traumatic split" from Spain an early declaration of independence, catelos Puiglemont, the Catalan pression conference, full on move wery swiftly from conferentiation now had the right to be free from Spain to the hinted that thris would no thap, peninmediately. There is no button to push for independence, catelos per services of the travel with Spain. Madrid priggemont at a press conference and to suppealer to the EU to help broker negotia: itoms: "It's obvious wene de mediation." Meaded: "We don't want a traumatic and investib at ant straumatic price per services to avoid a "traumatic per services" to favoro to findependence, catalon be Euveen polic excelling to botok to polic per interval. We want a new understant to suppealer to the suppealer to the suppealer to the support to taken between polic excelling to botok to polic per interval. We want a new understant to suppealer to the suppealer to the suppealer to the polic per interval. We want a new understant to suppealer to the suppealer to the suppealer to the suppealer to the polic per interval. We want a new understant to suppealer to the suppealer to the suppealer to the suppealer to the polic per interval. We want a new understant to suppealer to the suppealer to the suppealer to the pendence, it does not exist," said Patt it stopped short of the pendence in the suppealer to the suppealer to the suppealer to the suppealer to suppealer to the suppealer to the suppealer to the suppealer to suppealer to the suppealer to the suppealer to the suppealer to habe been a suppealer to the suppealer to th

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

66 Sloane Street, London SWIX 95H

60 Strutt & Parker offices nationwide | 1350 Christie's offices worldwi







Smith & Wesson said profi %, as gun sales slow from teir recent torrid pace. **B2** Pacific trade talks adjourned without a deal amid discord be tween the U.S. and Japan. A17 Italy pulled out of a twoear contraction in the third puarter, posting flat GDP. A1 ■ Three Swiss banks agreed to participate in a U.S. tax-eva-sion-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 eful microbes for plants.

* * * World-Wide

Congressional negotiato struck a budget deal that we allow more domestic and m ary spending and include defi it-cutting measures. **A1, A8** Ukrainian forces stormed protesters' encampment in Kiev, hours after Western dip-lomats called for a nonviolent end to the political crisis. **A13** ■ Obama's disapproval rate hit 54%, the high for his presi-dency, amid the flawed health-law rollout, a Wall Street Journal/NBC poll found. A4

World leaders gathered to onor Mandela. In a rare enounter, Obama shook hands th Cuba's Raúl Castro. A12

Senate Democrats con-firmed an Obama appeals-court pick and the head of Fan-nie and Freddie's overseer. A4 A key Senate Democrat Identification's request to Belay new Iran sanctions. A17 Bank Rule

Supreme Court justices pressed sympathy for the EPA approach to air pollution Challenges t crosses state lines. A2 Wall Street An AIDS group called for a

probe to see if HIV-infected pa-tients were discouraged from enrolling in health plans. A6 By JUSTIN BAER AND JULIE STEINBERG



China Spins New Lesson From Soviet Fall

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

PARTY DISCIPLINE

Here's Your Holiday Bonus, Now Start Running . . .

At a time of year when many

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

 enrolling in nearth plans. A6
 AND JULE STEINNERG

 I Uruguay's Senate voted to legalize marijuana. The presi-dent plans to sign the bill. AIS
 Ab road new government rule to imit risk-taking by Wall Street will force banks to rethink vitu-ally every aspect of their trading Central African Republic after two French troops died. AI3
 By RACHEL FEINTZEIG
 At a time of year when many workers anticipate a Christmas bonus check or a holiday ham, get the holiday gift he never house store until a few days ago.

 B Singapore police charged 24 Indian citizens in connec-tion with a night of rioting. AI3
 The so-called Volcker rule, ap proved by five financial regula to in with a night of rioting. AI3
 By RACHEL FEINTZEIG
 At a time of year when many workers anticipate a Christmas best ways to reward outstanding minutes at a Texas Costco.

24 Indian citizens in connec-tion with an ight of rioting. AI3 **Died:** Jim Hall, 83, ac-claimed jazz guitarist. **CONTENTS** the stare 6 Art. _ 06 <u>Borness Hol.</u> _ 6 <u>More dual.</u> _ 64 <u>Borness Hol.</u> _ 64

 BY JEREMY PAGE

 BELJING—The Communist Party boss in local officials recently to a compulsory study accumentary on the Soviet Union's collapse. The film begins with images of the Soviet bins in its heyday, but quickly totat rapplic footage of unrest in China's morthers and punctuated by Russian communists tai-menting their nation's fate.
 All apart because of the communist system state media reported, local party chief Lusy correctly understand the lessons of history; "correctly understand the lessons of history."
 The office in charge of Mr. XI's campaign diaged full apart of an ideological cam-ticated it, especially Mikhail Gorbachev. The film begins with images of the Soviet main its heyday, but quickly totat and part to a solution of the Soviet to the spread of the communist state.
 The office in charge of Mr. XI's campaign diaged "20th Anniversary of the Death of the soviet Party and State: As the Russians Re-targed its empletes. It has being have the solution in the 1990s, set to ominous music and punctuated by Russian communists tai-bottical system rather than limit the party point of an effort to combat what is port "correctly understand the lessons of history." "Correctly understand the lessons of history." The film, which approved the object of the combat what is point of an effort to combat what is port and the film ing the Stating its system and indical system rather indicas and popular culture.



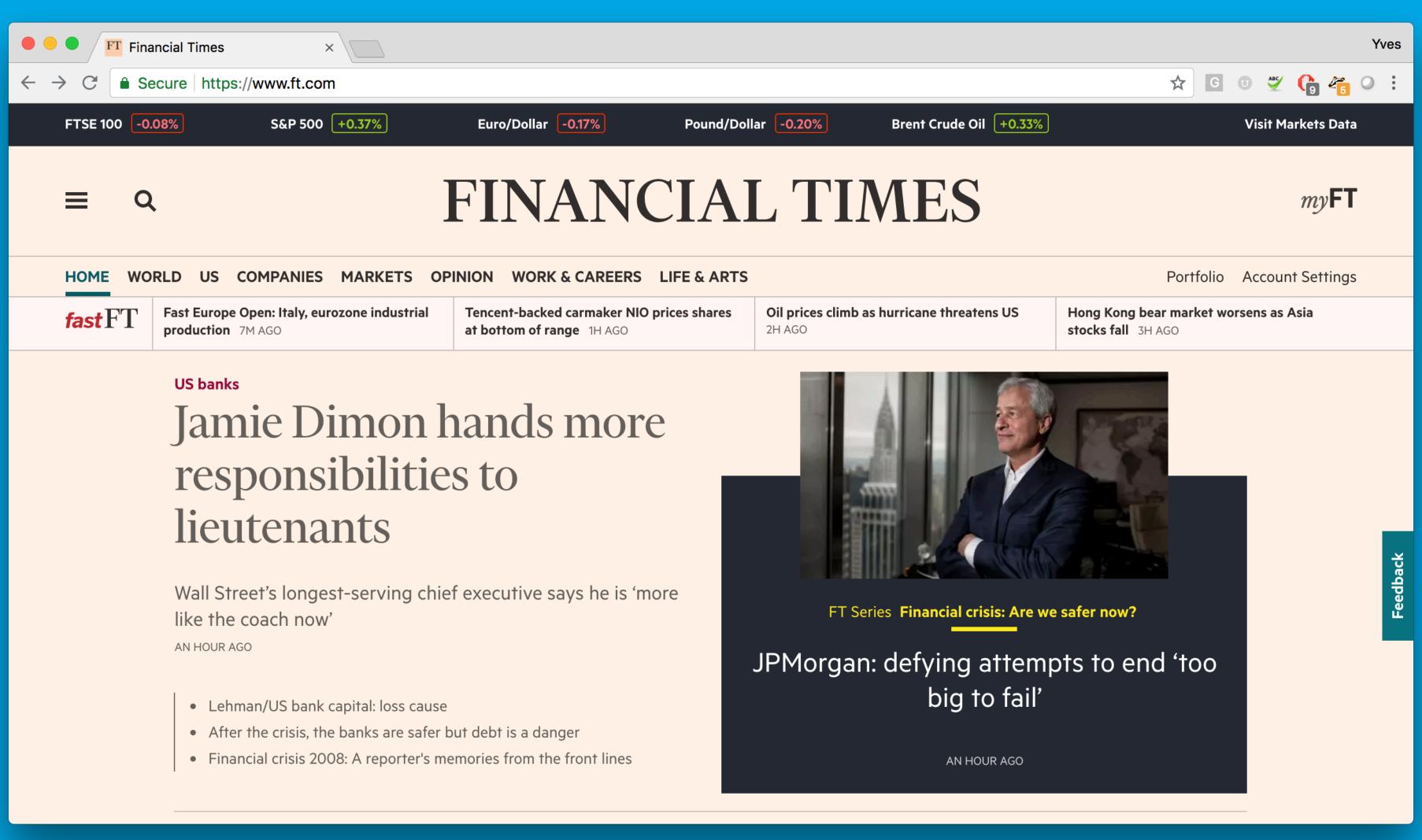
continue to face obstacles....
 Heard on the Street......



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

Ms. Barra will succeed Dan Ak-erson as CEO next month and be-come the first woman to run a major global auto maker. The 51-year-old joined GM 33 years ago as a college intern, eventually be-coming an engineering manager before running one of its big U.S. assembly plants. She got global experience managing human re-sources and, more recently, the company's world-wide product development groun development group. She will become the 22nd

oman currently running a Fo Please turn to page Al



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	anufactures and markets mobile communication and media devices, personal computers The Company sells a range of related software, services, accessories, networking solution		Open			AAPL.O 115.190000	Price USD	
	nd applications. The Company's segments include the Americas, Europe, Greater China		Prev. Close Bid / Ask				M / 117.260000	
	nericas segment includes both North and South America. The Europe segment includes iddle East and Africa. The Greater China segment includes China, Hong Kong and Taiwa		VWAP			- 1	115.00	
Asia Pacific segment i	ncludes Australia and the Asian countries not included in the Company's other operating	g segments. Its	Turnover			1 M M	110.00	
	include iPhone, iPad, Mac, iPod, Apple Watch, Apple TV, a portfolio of consumer and pr iPhone OS (iOS), OS X and watchOS operating systems, iCloud, Apple Pay and a range		Volume			6 Min M M 105.0 100.0		
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10:24:36	Apple dominerade julhandeln mätt i antalet aktiverade enheter	FNW	Mkt Cap	USE	USD 625.27B Dec-31 Mar-31 Jun-30 Sep- 14-Dec-2016			
10:15:18	UPDATE 3-S.Korea fines Qualcomm \$854 mln for violating competition laws	RTRS	PE (LTM)		14.12	Today 5D 3M 6M 1Y 5Y	No Benchmark 🗸	
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06:00:10	RPT-Wall Street cale une fois de plus au seuil des 20.000 points	RTRS	DR	BRL 🗗 🗚 AAPL34	. <mark>SA</mark> (1:0.1)) 52Wk: 89.47		
03:30:18	Aumento del gasto de último minuto impulsa a temporada de ventas de fin de año	RTRS	DR Type			12-May 11-Oct		
01:50:14	Last-minute spending surge lifts U.S. holiday shopping season	RTRS	DR Bank	Next Earn Report: 24-Jan-2			ext Earn Report: 24-Jan-2017	
27-Dec-2016			Free Float	5.32B	Asset Ty	oe Ordinary Share 🗗 5 yr Cl	26.980 bps	
23:33:16	Reuters Insider - Tech stocks could take the Dow to 20k	CNBC	Outstanding	5.33B	Share Cl		-0.07%	
23:32:28	Reuters Insider - History suggests Dow could hit 20k by Friday: Technician C		IPO Date	12-Dec-1980		∆ 1 Week	-0.074	
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22:09:39	WALLST	FUNDAMENTALS						
EVENTS	Past				AAPL Growt (Sep-2016)	h Industry		
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BUSINESS SUMMARY >		PRICE PERFORMANCE >					
Apple Inc. designs, manufactures and markets mobile communication and media devices, personal computers		Open			AAPL.O 115.190000 Price USD		
digital music players. The Company sells a range of related software, services, accessories, networking solutio party digital content and applications. The Company's segments include the Americas, Europe, Greater China,		Prev. Close			M N 117.260000		
of Asia Pacific. The Americas segment includes both North and South America. The Europe segment includes I		Bid / Ask			- 115.00		
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products and services include iPhone, iPad, Mac, iPod, Apple Watch, Apple TV, a portfolio of consumer and pro software applications, iPhone OS (iOS), OS X and watchOS operating systems, iCloud, Apple Pay and a range of		Turnover Volume			105.00		
service and support offerings.	or accessory,	Short Interest 0.90%			Mu M. 100.00		
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28-Dec-2016		Beta (5Y Monthly)		1.29	90.00		
10:24:36 Apple dominerade julhandeln mätt i antalet aktiverade enheter	FNW	Mkt Cap	USD 625.27B Dec-31 Mar-31 Jun-30 Sep- 14-Dec-2016				
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09:42:52 Corea del Sur multa a Qualcomm con 854 mlns dir por violar leyes de competencia	RTRS	Div Yield		1.94%	Today 5D 3M 6M 1Y 5Y No Benchmark V		
06:00:10 RPT-Wall Street cale une fois de plus au seuil des 20.000 points	RTRS	DR E	BRL 🗗 🗛 PL34	. <mark>SA</mark> (1:0.1)	52Wk: 89.47 118.69		
03:30:18 Aumento del gasto de último minuto impulsa a temporada de ventas de fin de año	RTRS	DR Type			12-May 11-Oct		
01:50:14 Last-minute spending surge lifts U.S. holiday shopping season	RTRS	DR Bank			In the second		
27-Dec-2016		Free Float	5.32B	Asset Typ	De Ordinary Share 🗗 5 yr CDS 26.980 bps		
23:33:16 Reuters Insider - Tech stocks could take the Dow to 20k	CNBC	Outstanding	5.33B	Share Cla	ass ∆ Today -0.07%		
23:32:28 Reuters Insider - History suggests Dow could hit 20k by Friday: Technician	CNBC	IPO Date	12-Dec-1980	Lot Size	∆ 1 Week -0.074		
22:55:29 LEAD 2-Wall Street cale une fois de plus au seuil des 20.000 points	RTRS	First Trade Da	12-Dec-1980	Voting Ri	ghts 1		
22:09:39 Apple, Cisco Lead DJIA Higher Tuesday	WALLST	FUNDAMENTALS >					
EVENTS > Upcoming	Past				AAPL Growth Industry		
24-Jan-2017 » 30-Jan-2017					(Sep-2016)		
NTS Q1 2017 Apple Inc Earnings Release		Gross Margin			38.02% (4.71%) 4Q 38.91%		
24-Feb-2017 » 28-Feb-2017		Operating Margin			25.10% (11.59%) 4Q 5.75%		

Data specialist Enigma reels in investment group cash

Hedge funds and venture capital firms move into analytics businesses they use themselves

Lindsay Fortado in New York YESTERDAY

Hedge funds, banks and venture capital firms are piling into investments in data companies in the hope of cashing in on a business they are using a lot more themselves.

In recent years, there has been a **proliferation of start-ups** that trawl through reams of data and sell it to investment groups searching for an edge.

The latest to attract investor interest is Enigma, a New York-based start-up that received funding from sources including quant giant Two Sigma, activist hedge fund Third Point and venture capital firms NEA and Glynn Capital in a \$95m capital raising announced on Tuesday.

Enigma collects a huge range of data including the contents of every container ship that arrives in US ports every week, <u>aeroplane registrations</u>, elevator inspection reports in California and data on amusement park rides in Arkansas.

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Source: FT | 19 Sep 2018

Tick Data

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	<pre><class 'pandas.core.frame.dataframe'=""> DatetimeIndex: 1898 entries, 2017-07-11 16:0 Data columns (total 2 columns): VALUE 1892 non-null float64 VOLUME 1898 non-null float64 dtypes: float64(2) memory usage: 44.5 KB</class></pre>						
In [25]:	<pre>tick.tail()</pre>						
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				

-07-11 16:00:0000', 7-11 16:15:0000',

:00:00.686000 to 2017-07-11 16:14:59.708000

News

In [29]:	<pre>[29]: news = ek.get_news_headlines('R:.SPX AND "Trump" AND Language:LEN', count=5) news</pre>					
Out[29]:	versionCreated	text storyld	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]:	<pre>storyId = news.iloc[4, 2] storyId</pre>					
Out[30]:]: 'urn:newsml:reuters.com:20170817:nL4N1L34N1:5'					
In [31]:	<pre>from IPython.display import display, HTML</pre>					
In [32]:	<pre>32]: display(HTML(ek.get_news_story(storyId)))</pre>					
	 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 sessio	n lows in early afternoon trading on Thursday as investors worried about President Donald Tru	imp's ability to			



NumPy matp



IPython





pandas





AI-First Finance

MARCOS LOPEZ DE PRADO

ADVANCES in FINANCIAL MACHINE LEARNING

WILEY

"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."

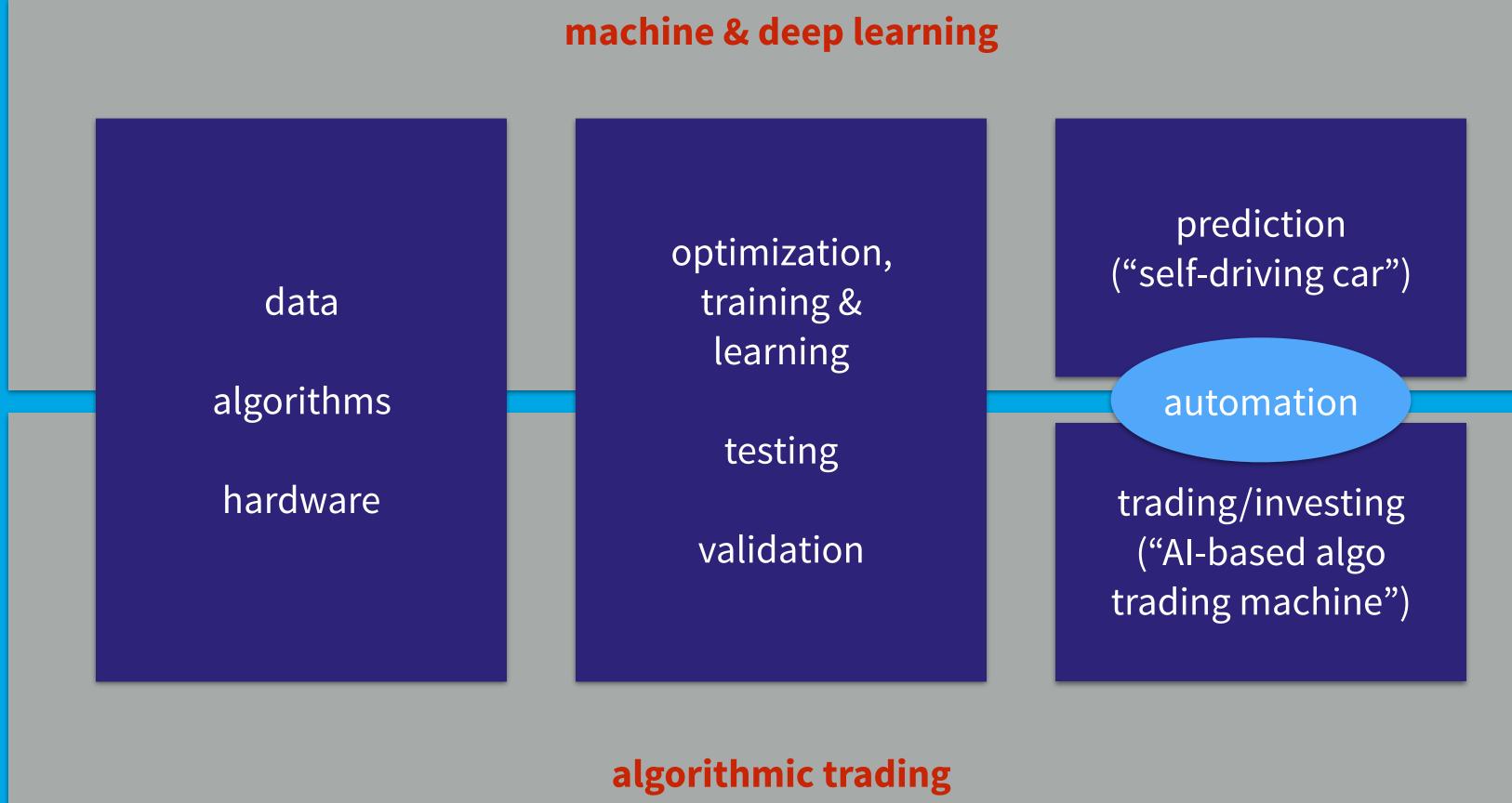
"... what if economists finally started to consider non-linear functions?"

"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)





Financial Markets





"non-linear, complex, changing"

"brain-driven & beauty myth"

Finance History

Al in Finance = finaince

X



f(•)

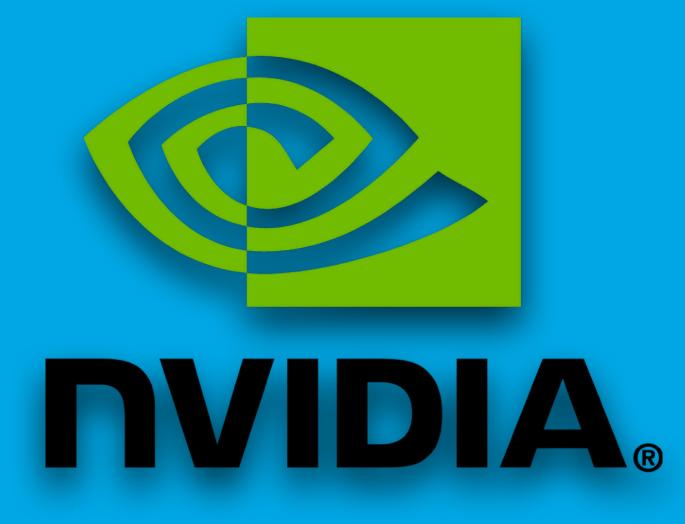
f(x) ≠ **y**

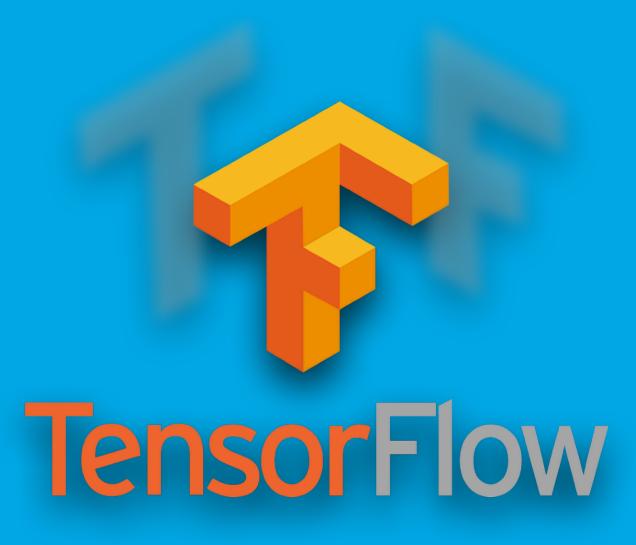
m(•, a, b)

m(x, a*, b*) ≈ y

"data-driven & Al-first"







Λ



PLATFORM	STRATEGIES	DEPLOYMENT
Python, packages & Jupyter Notebook	Retrieving Historical Data	Streaming Tick Data
Demo Account with FXCM	Generating Features Data	Data Collection
Python Wrapper fxcmpy	Training Classification Models from ML & DL	Online Algorithm
First Steps with the API	Vectorized Backtesting	Automated Trading

Resources

http://bit.ly/odsc_ldn_2018

If you are interested in more ...

The Python Quants GmbH The Python Quants GmbH 66333 Voelklingen Germany TIF +49 3212 112 91 94 TIF +49 3212 112 91 94 http://training.tpq.io http://training.tpq.io training@tpq.io

April 2017

The Python Quants GmbH

Verd by Outlook ungerin

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PROGRAM DIRECTOR

isch is founder a

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THEPYTHON

UNIVERSITY CERTIFICATE ALGORITHMIC TRADING IN PYTHON FOR

Constants

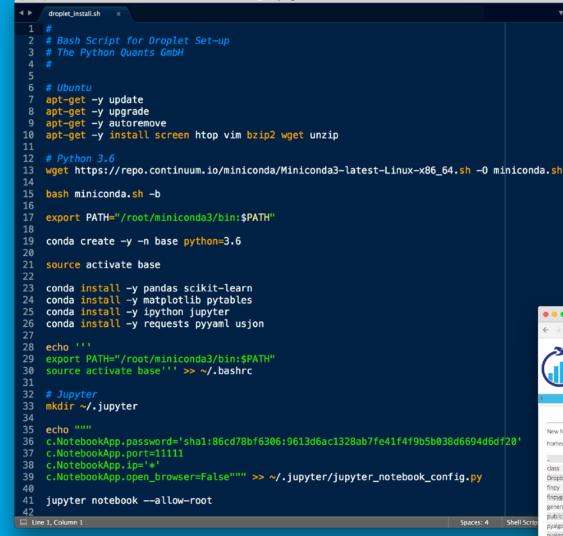
Tall 0



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5,000+ lines of code

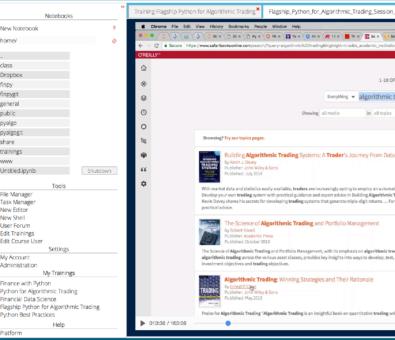


30+ hours of additional live/recorded sessions

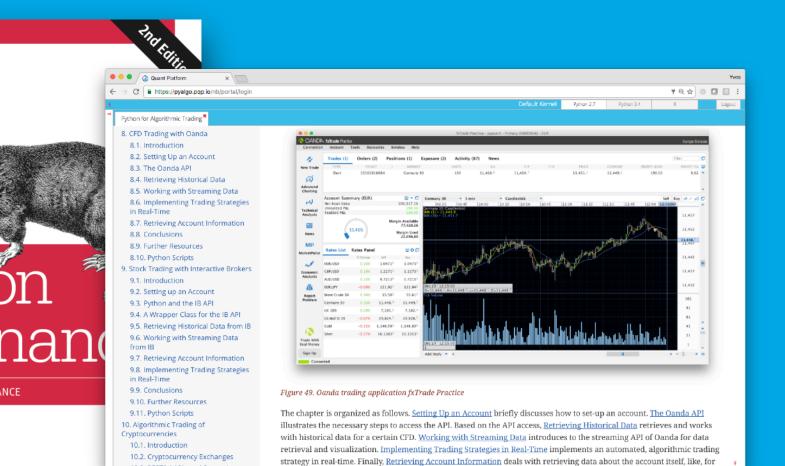
150+ hours of pre-recorded video instruction

• • • Quant Platform × O Secure https://pyalgo.pqp.io/nb/portal/logi

THE PYTHON QUANTS

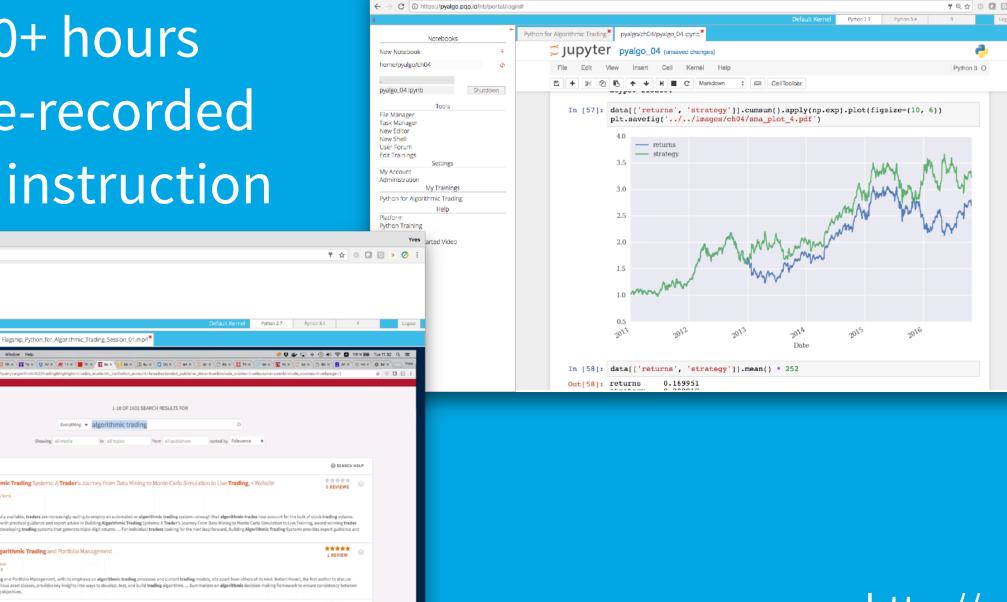


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The Python Quants GmbH

Dr. Yves J. Hilpisch +49 3212 112 9194 http://tpq.io | team@tpq.io @dyjh



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