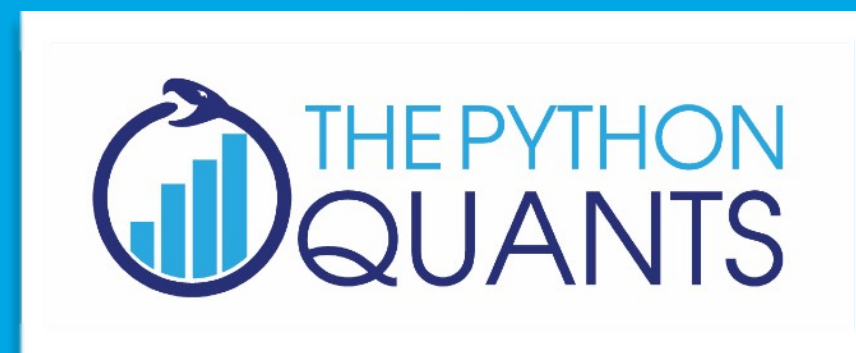


Algorithmic Trading with Machine Learning & Deep Learning

Dr. Yves J. Hilpisch

http://bit.ly/odsc_ldn_2018



Introduction

SERVICES

for financial institutions globally



EVENTS

for Python quants & algorithmic traders



THE PYTHON
QUANTS

TRAINING

about Python for finance
& algorithmic trading



CERTIFICATION

in cooperation with university



BOOKS

about Python and
finance



PLATFORM

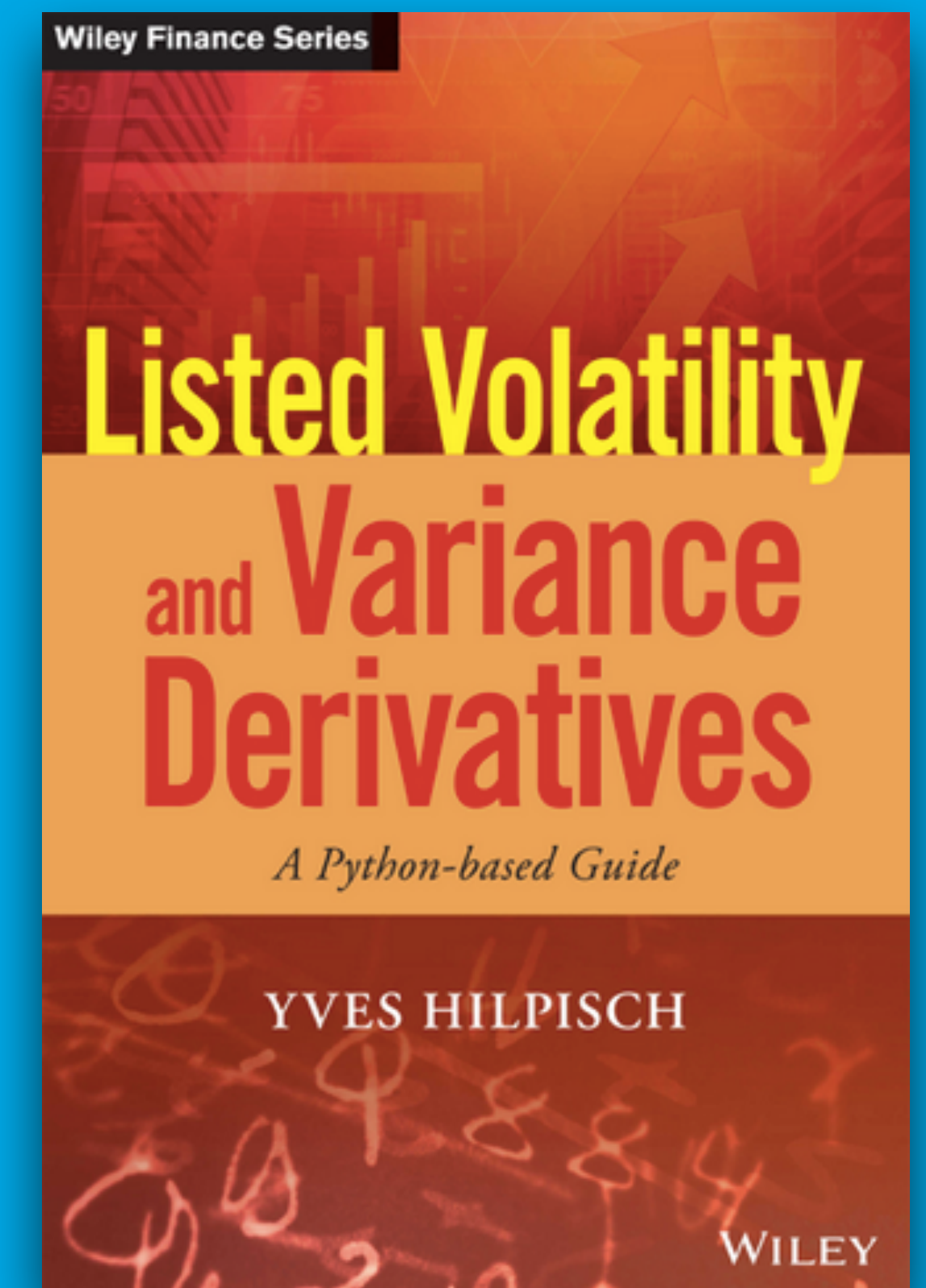
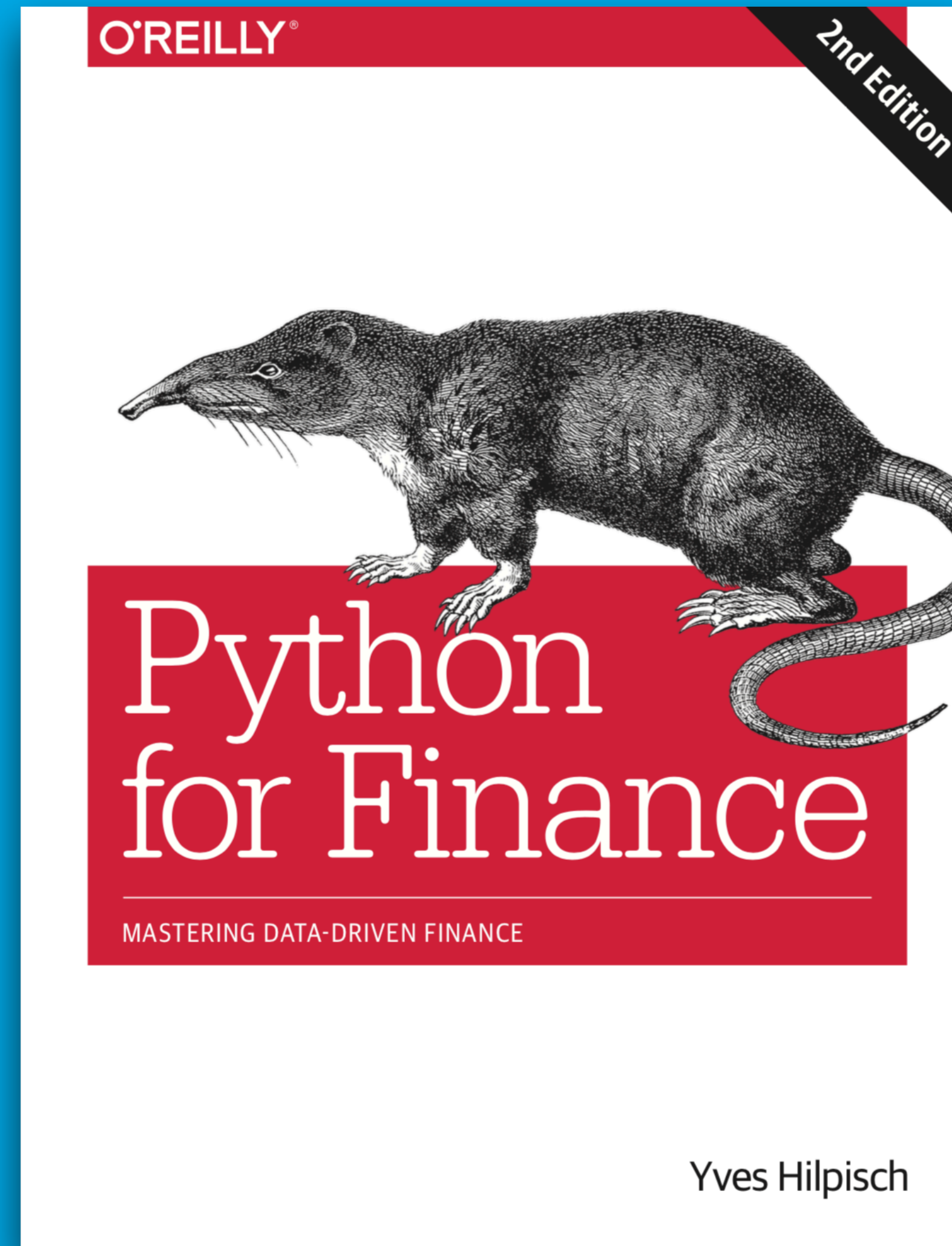
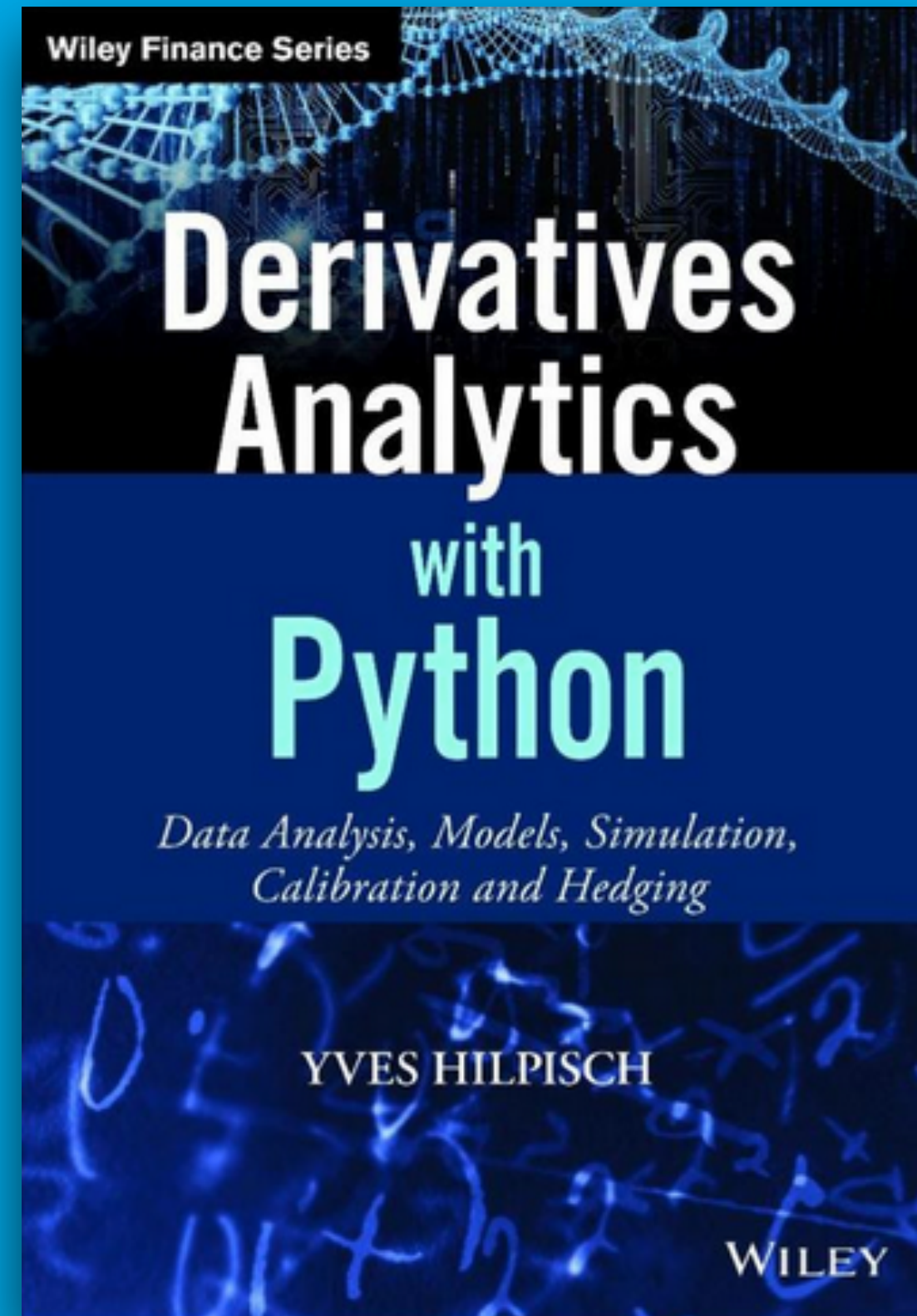
for browser-based
data analytics



OPEN SOURCE

Python library
for financial analytics





<http://books.tpq.io>

Banking CIO Outlook

FEBRUARY, 2017

BANKINGCIOOUTLOOK.COM

Top 10 Banking Analytics Solution Providers

Today's data-driven banking industry portrays a scenario 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 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,

banks are leveraging analytics to these digital currencies, by verifying with an unprecedented level of

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

To help CIOs and CFOs solution provider, a distinguished CFOs, VCs, analysts, and the Bank has selected top players from the demonstrate an ability to develop methodologies along the bank outstanding customer service.

We present to you Banking Analytics Solution Providers 20

The Python Quants GmbH

recognized by **Banking CIO Outlook** magazine as

TOP 10
BankingAnalytics
SOLUTION PROVIDERS - 2017

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

Company:

The Python Quants Group

Description:

Focused on Python and Open Source Technologies for Financial Data Science, Algorithmic Trading and Computational Finance

Key Person:

Dr. Yves J. Hilpisch
Managing Partner

Website:

tpq.io

The Python Quants GmbH

recognized by **Banking CIO Outlook** magazine as

TOP 10
BankingAnalytics
SOLUTION PROVIDERS - 2017

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

Banking TOP 10
CIO BankingAnalytics
Outlook SOLUTION PROVIDERS - 2017

The Python Quants Group Enhance Financial Analytics

Over the years, the ecosystem of scientific, numerical and data analytics packages available for Python has grown rapidly and has finally made it

experience with Python for Finance and provide a hands-on learning experience, making heavy use, for instance, also of our Quant Platform.”

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

In an instance, Eurex, one of the leading derivatives exchanges, wanted to support investors, traders, market makers and quants in the understanding and trading of their listed volatility and variance products. Eurex decided to use Python for this project and The Python Quants were tasked to create the content and in particular the Python codes accompanying it. While the content itself became part of the 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, is often a tedious and sometimes even a risky process, with our services and products we help our clients to make this process more efficient and mitigate risks,” adds Hilpisch.

Another product of The Python Quants Group assisting organizations to model, price and risk manage complex portfolios of (multi-risk) derivatives with potentially complex correlation structures

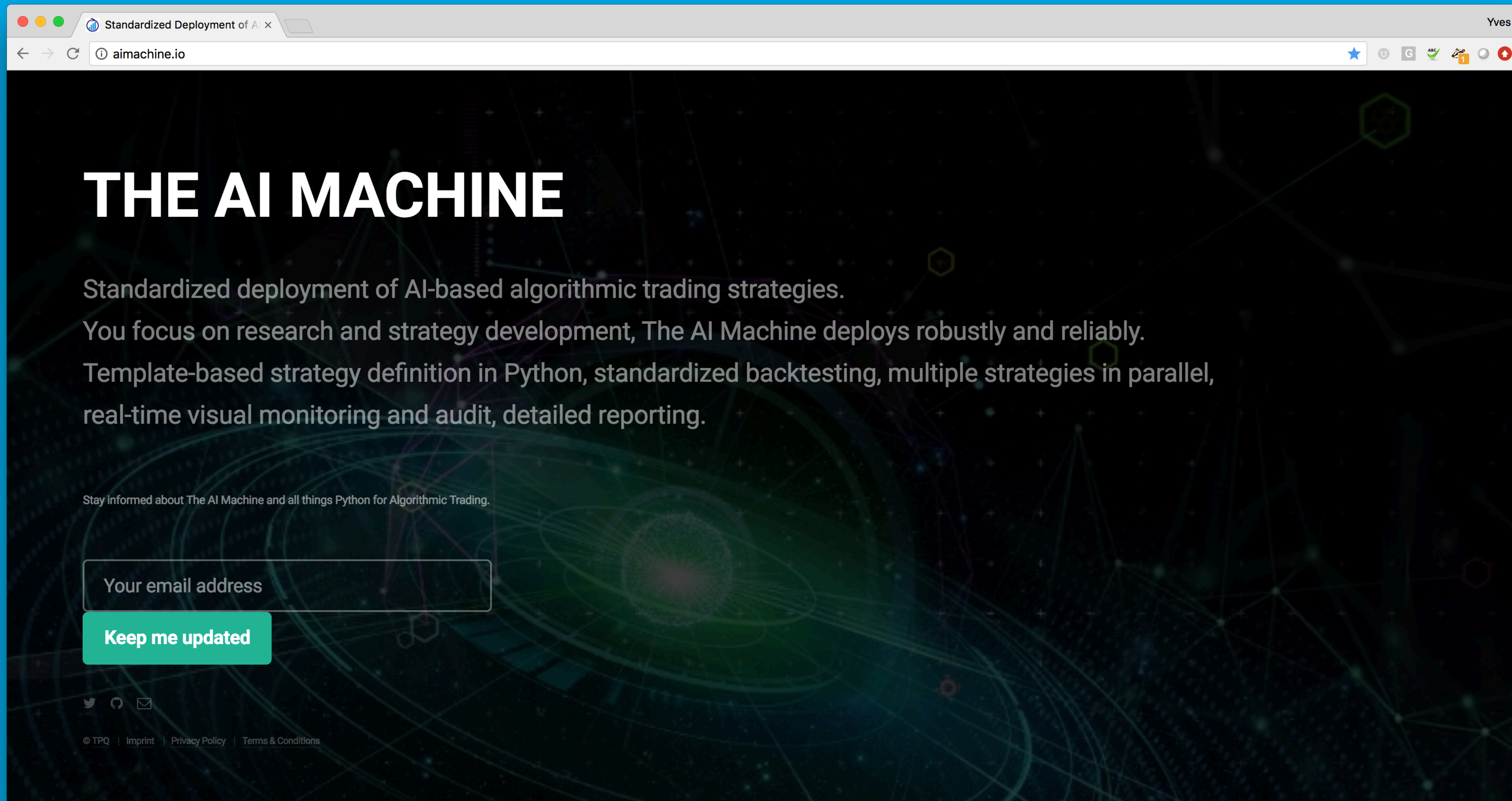


Dr. Yves J. Hilpisch

is DX Analytics. Being an open source derivatives, portfolio and risk analytics library written exclusively in Python—it makes heavy use of the capabilities of Python and the capabilities of its numerical 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 on machine and deep learning techniques, technologies emerging in algorithmic trading as well as on cryptocurrencies and blockchain. “We will improve our value proposition in particular for hedge funds and other buy side players for the days to come,” concludes Hilpisch. **BC**



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

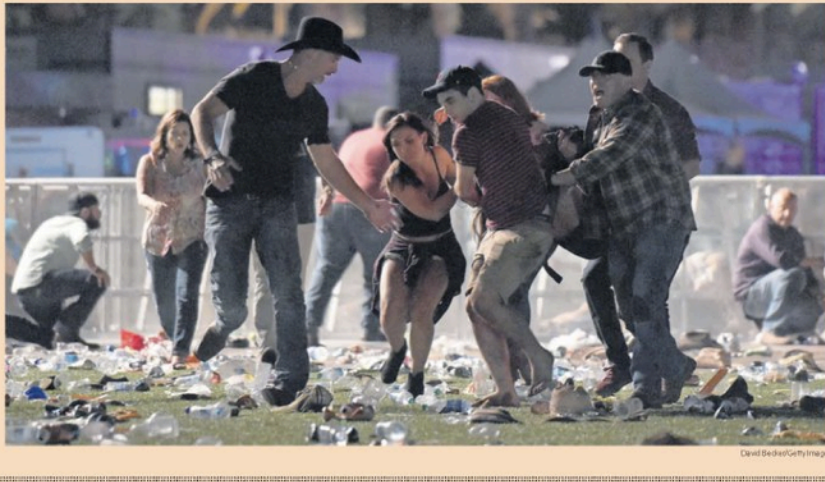
The myths that hold back women in Indian society — AMY KAZMIN, PAGE 10



Las Vegas reels from worst US mass shooting

A casualty is carried from the scene after a gunman opened fire on concertgoers in Las Vegas on Sunday night. More than 58 people were killed and over 150 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.



Chris Wedel/Reuters/Corbis

Catalan president urges Brussels to mediate in independence clash

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

MICHAEL TOTTHARD — BARCELONA
AN ROBERT — GIRONA
The Catalan government said it wanted to avoid a "traumatic split" from Spain and appealed to the EU to mediate with Madrid in its bid to hold a referendum on independence.

Carles Puigdemont, the Catalan president, said that after Sunday's vote, when 99 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.



Carles Puigdemont, the Catalan president, said that after Sunday's vote, when 99 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.



Brussels calls for battery development consortium

Report — PAGE 4

Country	Company	Value
Austria	Red Bull	€100
Belgium	Van Melle	€100
France	Alcatel	€100
Germany	Siemens	€100
Italy	Enel	€100
Japan	Toyota	€100
Spain	Inditex	€100
UK	BT	€100
US	Google	€100

Source: Bloomberg

Subscribe in print and online

www.ft.com
MiddleEastSubscriptions
Tel: +44 20 7775 6000
email: ft.msub@ft.com

© THE FINANCIAL TIMES LTD 2017

No. 39,995

Printed in London, Liverpool, Glasgow, Dublin, Frankfurt, Milan, Madrid, New York, Chicago, San Francisco, Washington DC, Toronto, Tokyo, Hong Kong, Singapore, Seoul, Osaka, etc.



0 30011 31010

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.

Thomas Freeman, secretary of the Nobel Assembly, said he 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 Nobel (S1 line) prize, the researchers "were able to peek inside our biological clock and elucidate its inner workings. Their discoveries explain how plants, animals and humans adjust their biological rhythm so that it is synchronised with the Earth's revolution."

Johann Zatz of the Nobel Assembly said the research helped to "raise awareness of the proper importance of sleep hygiene and the importance of really making certain we allow ourselves to go to bed at an hour that is 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 pair of genes 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.

Carlson Ritzler 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."

Briefing

► **Puerto Rico calls for billions in aid**
Rafael Maldonado Gaudier, 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 files in**
Jo Bertram, Uber's UK boss, has quit the company a day before a visit to London by Dara Khosroshahi, chief executive, to meet regulators over an attempt to revoke the ride-hailing application 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 stage 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



Source: Thomas Reuters Datastream, IMF

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page 13

News & analysis page 3

Editorial Comment page 11

Short View page

FT Financial Times

Yves

Secure

https://www.ft.com

☆ G U ABC 9 5

FTSE 100 -0.08%

S&P 500 +0.37%

Euro/Dollar -0.17%

Pound/Dollar -0.20%

Brent Crude Oil +0.33%

Visit Markets Data

≡ 🔍

FINANCIAL TIMES

myFT

HOME WORLD US COMPANIES MARKETS OPINION WORK & CAREERS LIFE & ARTS

Portfolio Account Settings

fastFT

Fast Europe Open: Italy, eurozone industrial production 7M AGO

Tencent-backed carmaker NIO prices shares at bottom of range 1H AGO

Oil prices climb as hurricane threatens US 2H AGO

Hong Kong bear market worsens as Asia stocks fall 3H AGO


US banks

Jamie Dimon hands more responsibilities to lieutenants

Wall Street’s longest-serving chief executive says he is ‘more like the coach now’

AN HOUR AGO

- Lehman/US bank capital: loss cause
- After the crisis, the banks are safer but debt is a danger
- Financial crisis 2008: A reporter's memories from the front lines



FT Series **Financial crisis: Are we safer now?**

JPMorgan: defying attempts to end ‘too big to fail’

AN HOUR AGO

Feedback

NEWS >

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


NTS

Q1 2017 Apple Inc Earnings Release




24-Feb-2017 » 28-Feb-2017

Open	AAPL.O 115.190000				Price USD
------	-------------------	--	--	--	-----------

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		

	AAPL (Sep. 2016)	Growth	Industry
--	---------------------	--------	----------

	(Sep-2016)		
Gross Margin	38.02%	(4.71%) 4Q	38.91%
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

4

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, [aeroplane registrations](#), elevator inspection reports in California and data on amusement park rides in Arkansas.

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

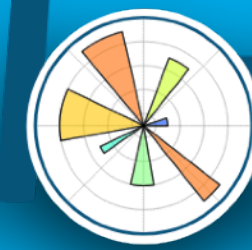


IP[y]:
IPython

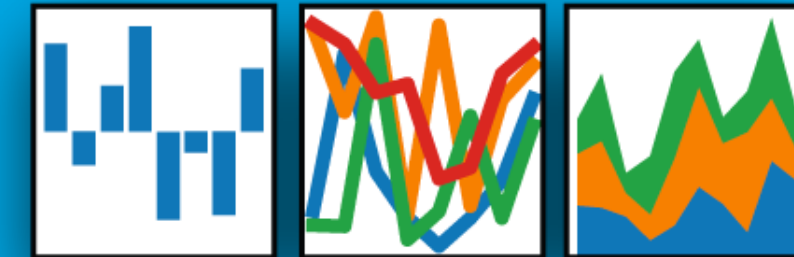


NumPy

matplotlib



pandas
 $y_{it} = \beta' x_{it} + \mu_i + \epsilon_{it}$



AI-First Finance

MARCOS LOPEZ DE PRADO

ADVANCES
in
FINANCIAL
MACHINE
LEARNING

WILEY

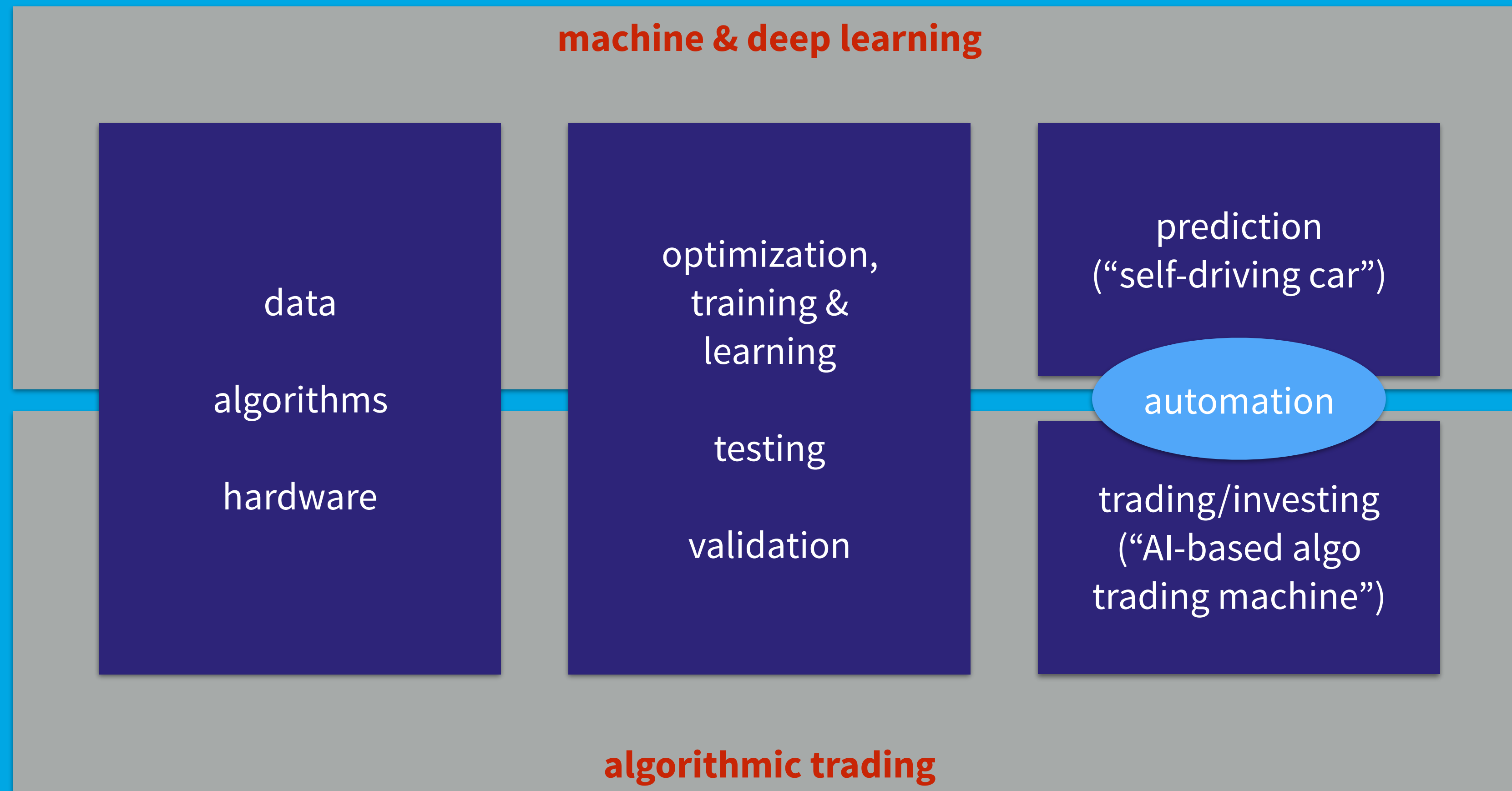
“The essential tool of econometrics is multivariate linear regression, an 18th-century technology that was already mastered by Gauss before 1794 ... It is hard to believe that something as complex as 21st-century finance could be grasped by something as simple as inverting a covariance matrix.”

“... 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

x



y

“non-linear, complex,
changing”

Finance History



$f(\cdot)$

$f(x) \neq y$

“brain-driven &
beauty myth”

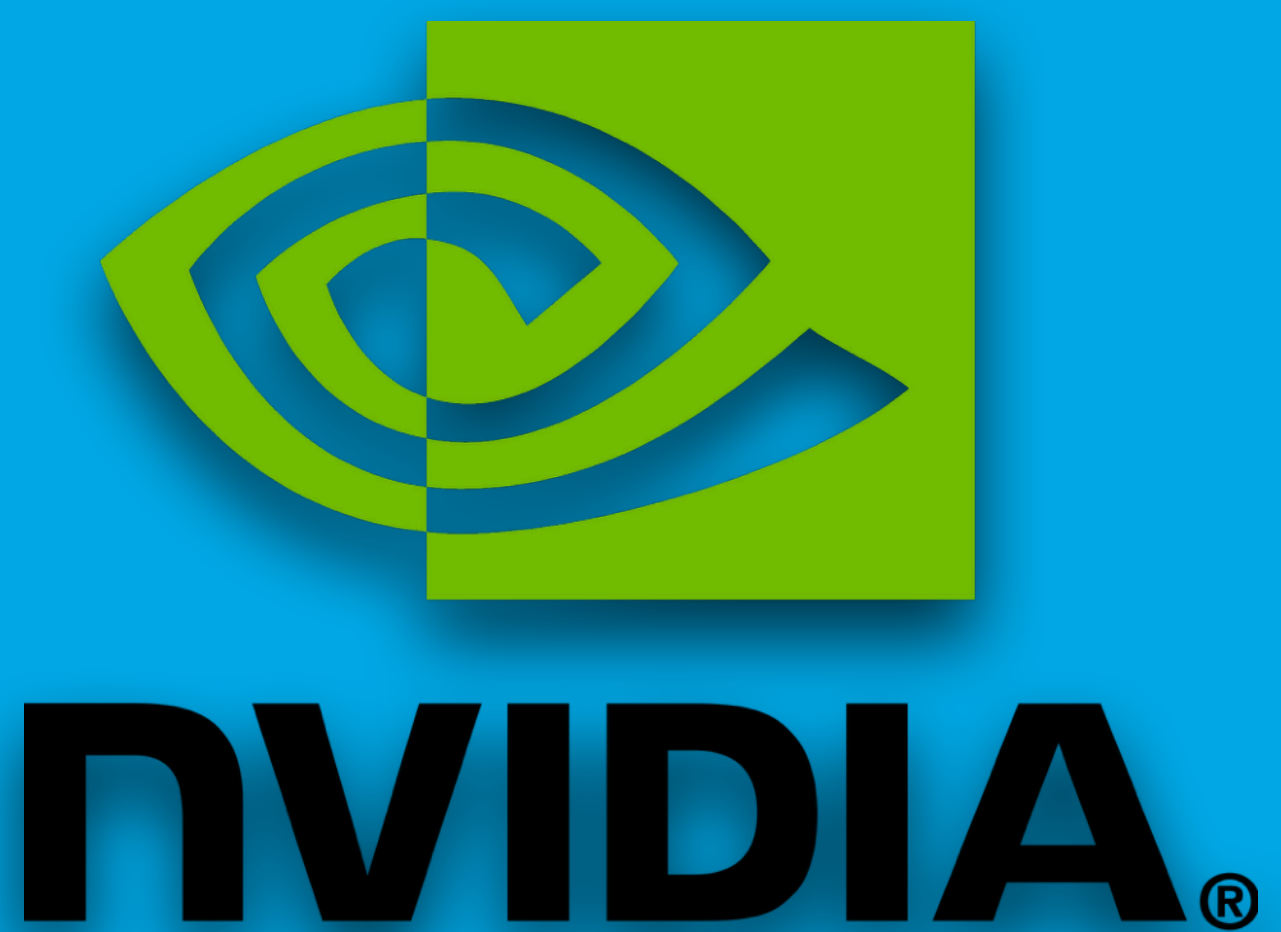
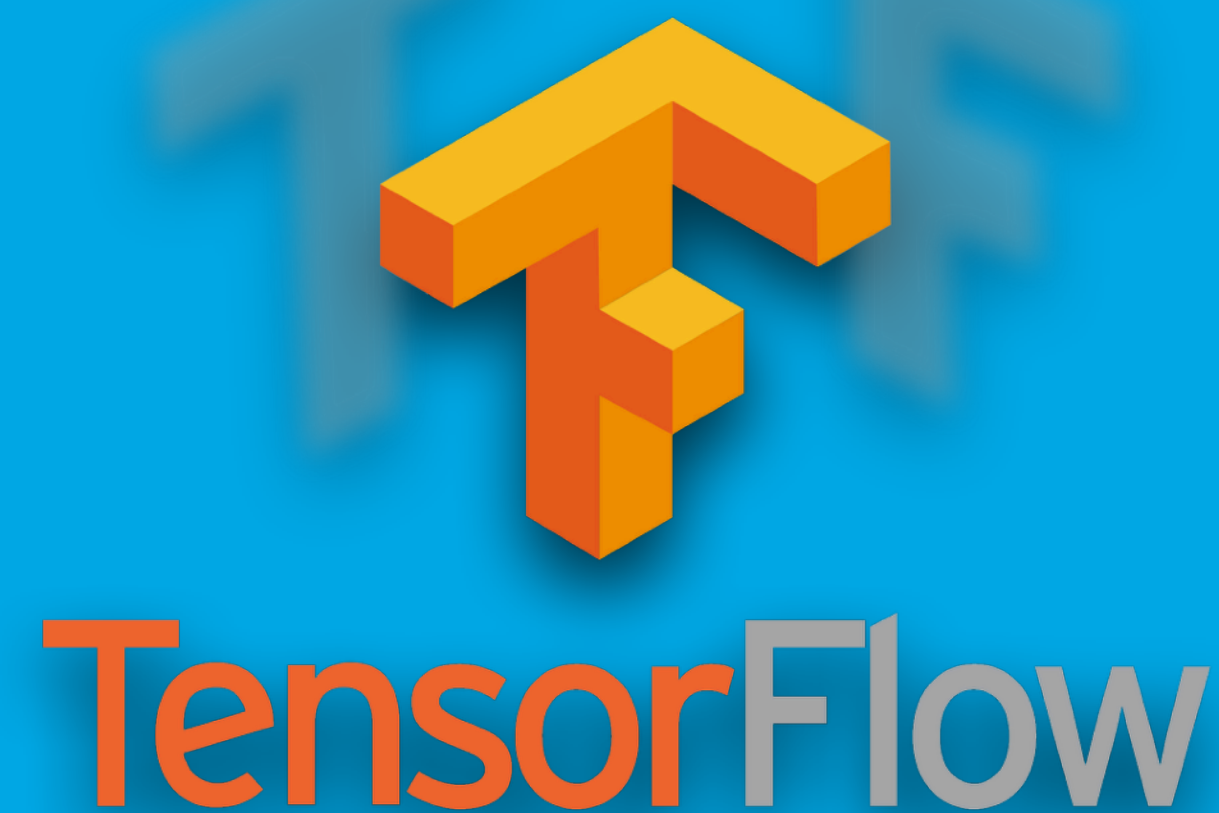
AI in Finance = finaince

x

$m(\cdot, a, b)$

$m(x, a^*, b^*) \approx y$

“data-driven &
AI-first”



Agenda

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

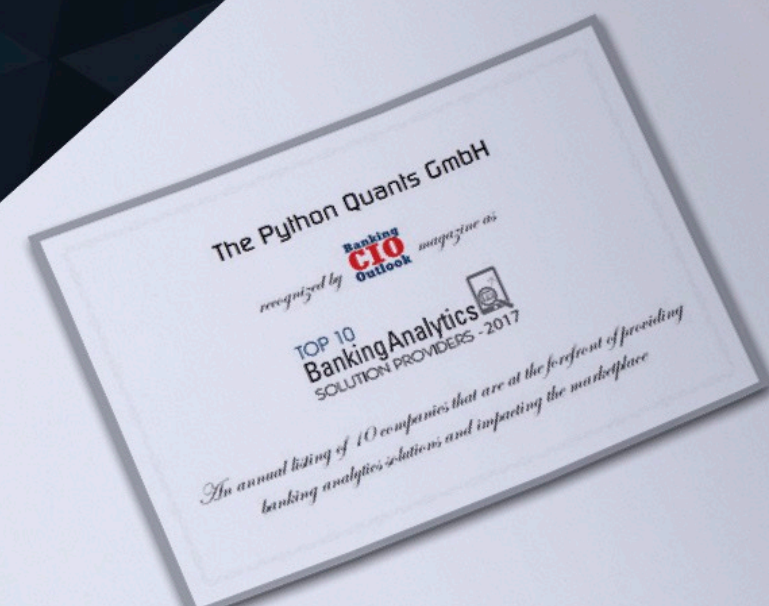
If you are interested in more ...

PROGRAM DIRECTOR

Dr. Yves J. Hilpisch is founder and managing partner of The Python Quants (<http://tpq.io>), a group focusing on the use of open source technologies for financial data science, algorithmic trading and computational finance. He is the author of the books:

- Python for Finance (O'Reilly)
- Derivatives Analytics with Python (Wiley)
- Listed Volatility and Variance Derivatives (Wiley)

He has written the financial analytics library DX Analytics (<http://dx-analytics.com>) and organizes conferences and Meetup events about Python for finance and algorithmic trading in Frankfurt, London and New York. He has given keynote speeches at technology conferences in the United States, Europe and Asia.



UNIVERSITY CERTIFICATE IN PYTHON FOR ALGORITHMIC TRADING



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

April 2017



1,200+ pages of
Finance with Python,
Python for Finance &
Algorithmic Trading

5,000+ lines of code

```
1 # Bash Script for Droplet Set-up
2 # The Python Quants GmbH
3
4
5
6 # Ubuntu
7 apt-get -y update
8 apt-get -y upgrade
9 apt-get -y autoremove
10 apt-get -y install screen htop vim bzip2 wget unzip
11
12 # Python 3.6
13 wget https://repo.continuum.io/miniconda/Miniconda3-latest-Linux-x86_64.sh -O miniconda.sh
14
15 bash miniconda.sh -b
16
17 export PATH="/root/miniconda3/bin:$PATH"
18
19 conda create -y -n base python=3.6
20
21 source activate base
22
23 conda install -y pandas scikit-learn
24 conda install -y matplotlib pytables
25 conda install -y ipython jupyter
26 conda install -y requests pyyaml usjorn
27
28 echo '''
29 export PATH="/root/miniconda3/bin:$PATH"
30 source activate base''' >> ~/.bashrc
31
32 # Jupyter
33 mkdir ~/.jupyter
34
35 echo '''
36 c.NotebookApp.password='sha1:86cd78bf6306:9613d6ac1328ab7fe41f4f9b5b038d6694d6d720'
37 c.NotebookApp.port=11111
38 c.NotebookApp.ip='*'
39 c.NotebookApp.open_browser=False''' >> ~/.jupyter/jupyter_notebook_config.py
40
41 jupyter notebook --allow-root
42
```

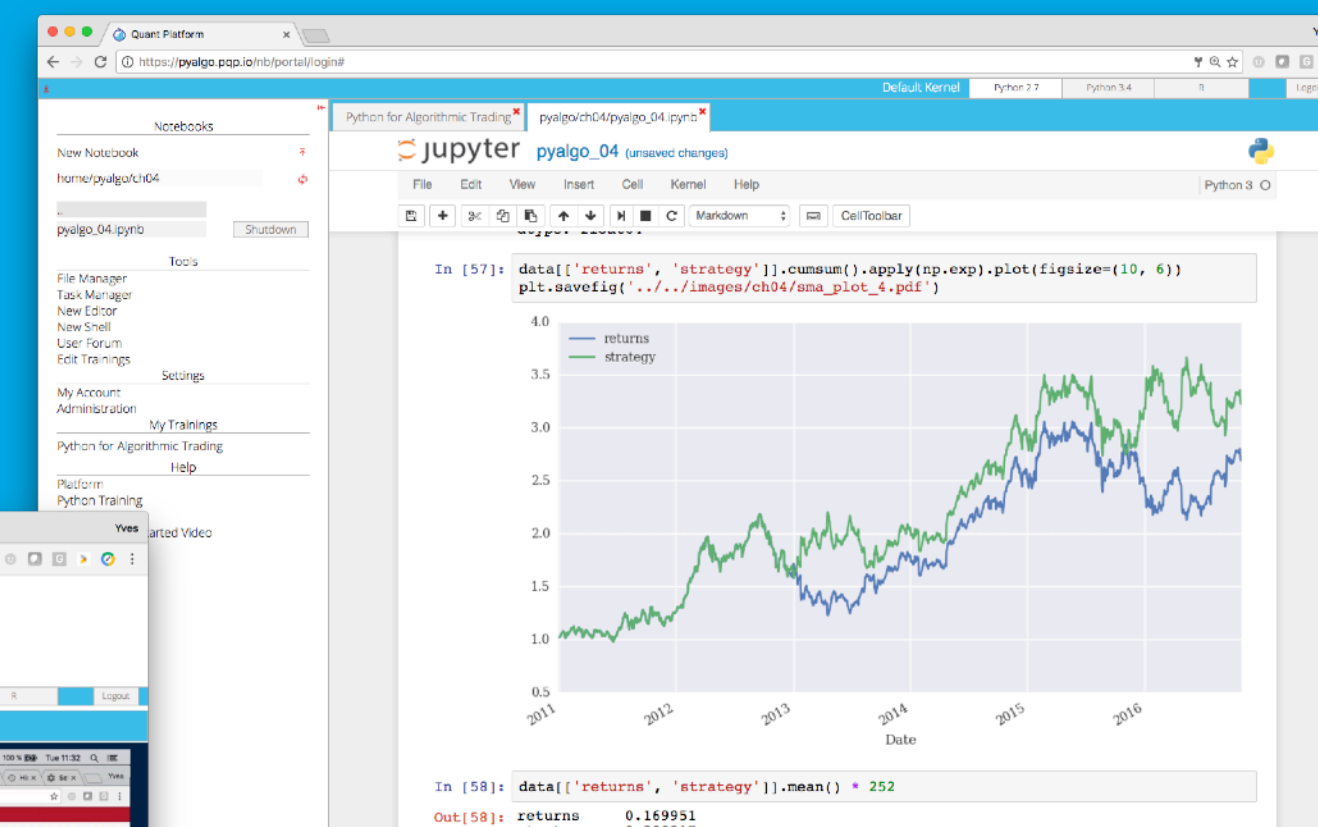
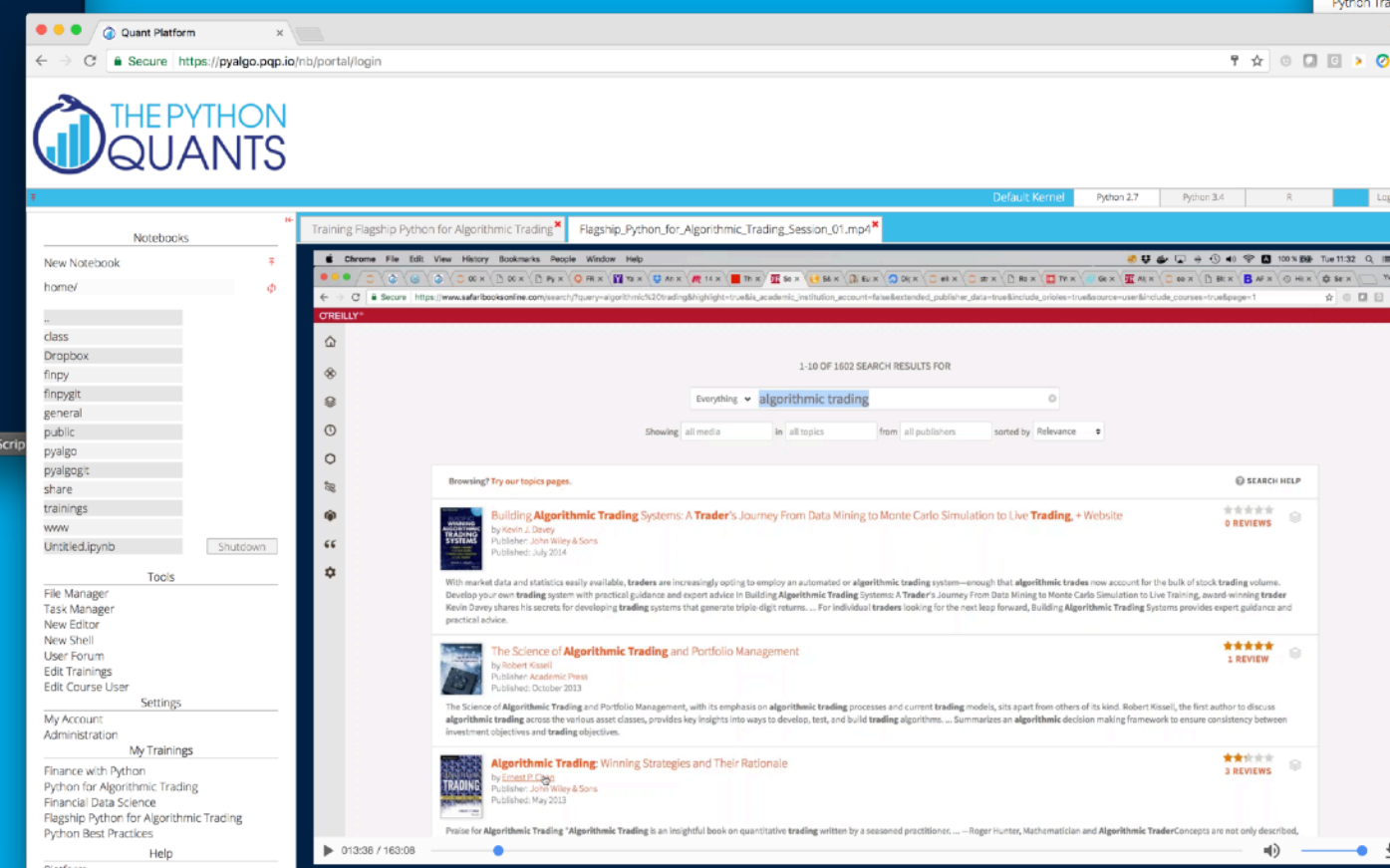
30+ hours of additional
live/recorded sessions



Figure 49. Oanda trading application *fxTradePractice*

The chapter is organized as follows. [Setting Up an Account](#) briefly discusses how to set up an account. [The Oanda API](#) illustrates the necessary steps to access the API. Based on the API access, [Retrieving Historical Data](#) retrieves and works with historical data for a certain CFD. [Working with Streaming Data](#) introduces to the streaming API of Oanda for data retrieval and visualization. [Implementing Trading Strategies in Real-Time](#) implements an automated, algorithmic trading strategy in real-time. Finally, [Retrieving Account Information](#) deals with retrieving data about the account itself, like, for

150+ hours
of pre-recorded
video instruction



<http://certificate.tpq.io>

FOR PYTHON QUANTS

AN EXCLUSIVE BOOTCAMP SERIES BROUGHT TO YOU BY [CQF INSTITUTE](#) AND [THE PYTHON QUANTS](#)



TICKETS

GET IN TOUCH

LONDON TUE 13. TO THU 15. NOVEMBER 2018

The **Bootcamp Series** for those working in Finance or doing Algorithmic Trading and using Python.

<http://fpq.io>

The Python Quants GmbH

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

