

Financial Singularity

AI Barcamp

Frankfurt, 25. October 2017

Dr. Yves J. Hilpisch



AGENDA

- 1. The Python Quants Group**
- 2. What is the Financial Singularity?**
- 3. What are Driving Forces in Algorithmic Trading?**
- 4. Is a Financial Singularity Possible?**

SERVICES

for financial institutions globally



EVENTS

for Python quants & algorithmic traders



TRAINING

about Python for finance
& algorithmic trading



CERTIFICATION

in cooperation with university



BOOKS

about Python and
finance



PLATFORM

for browser-based
data analytics

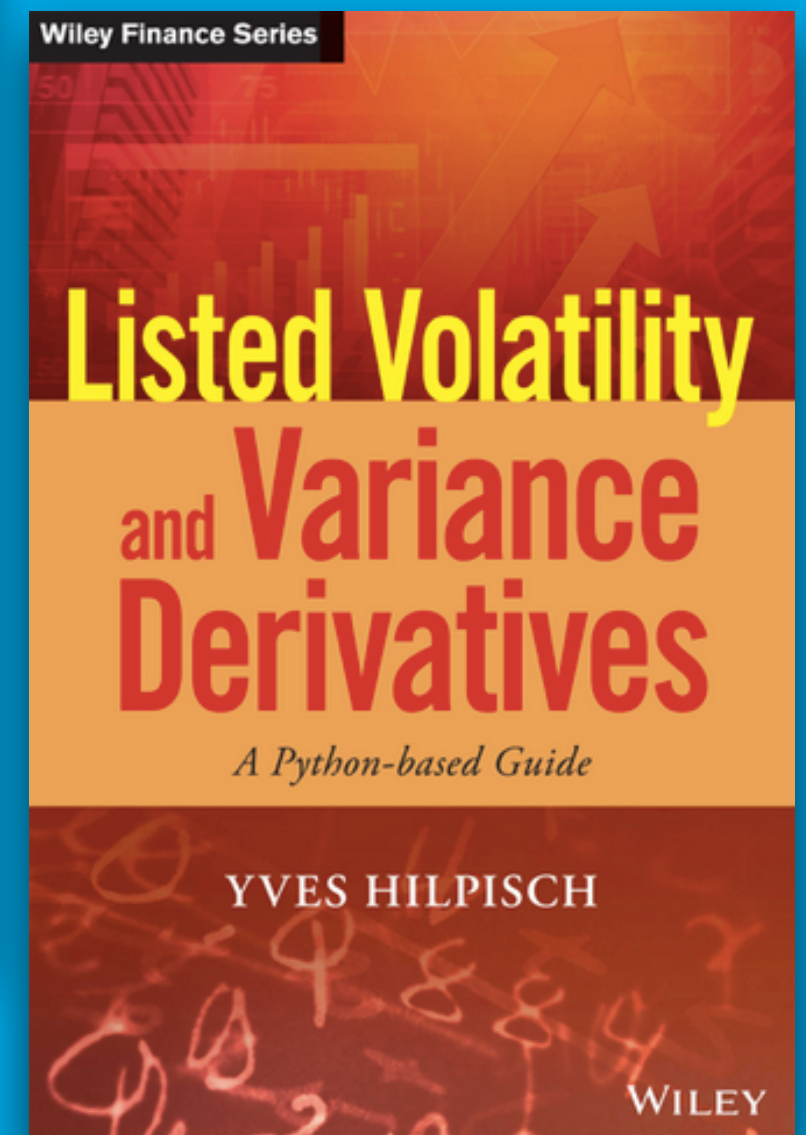
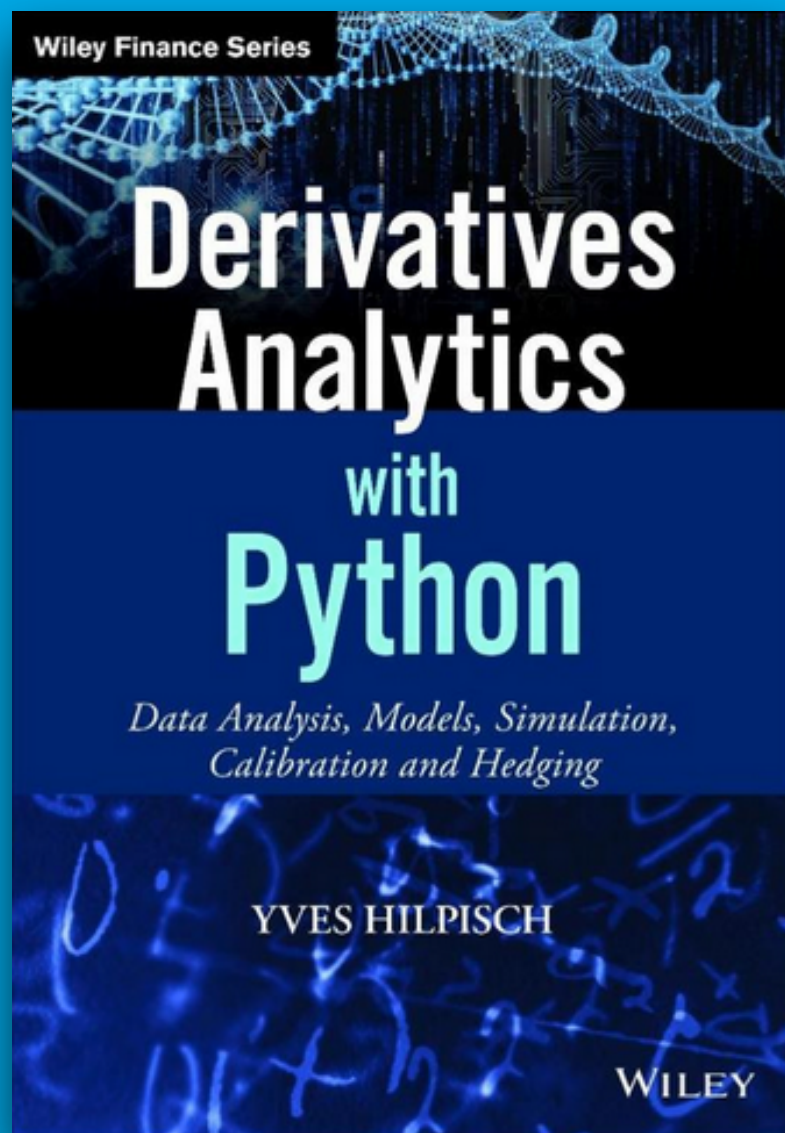


OPEN SOURCE

Python library
for financial analytics





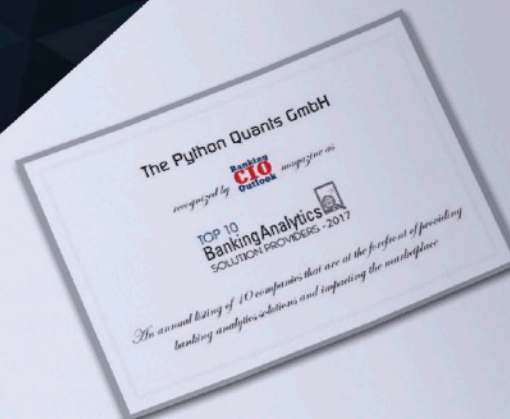


PROGRAM DIRECTOR

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)
- Python for Finance 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.



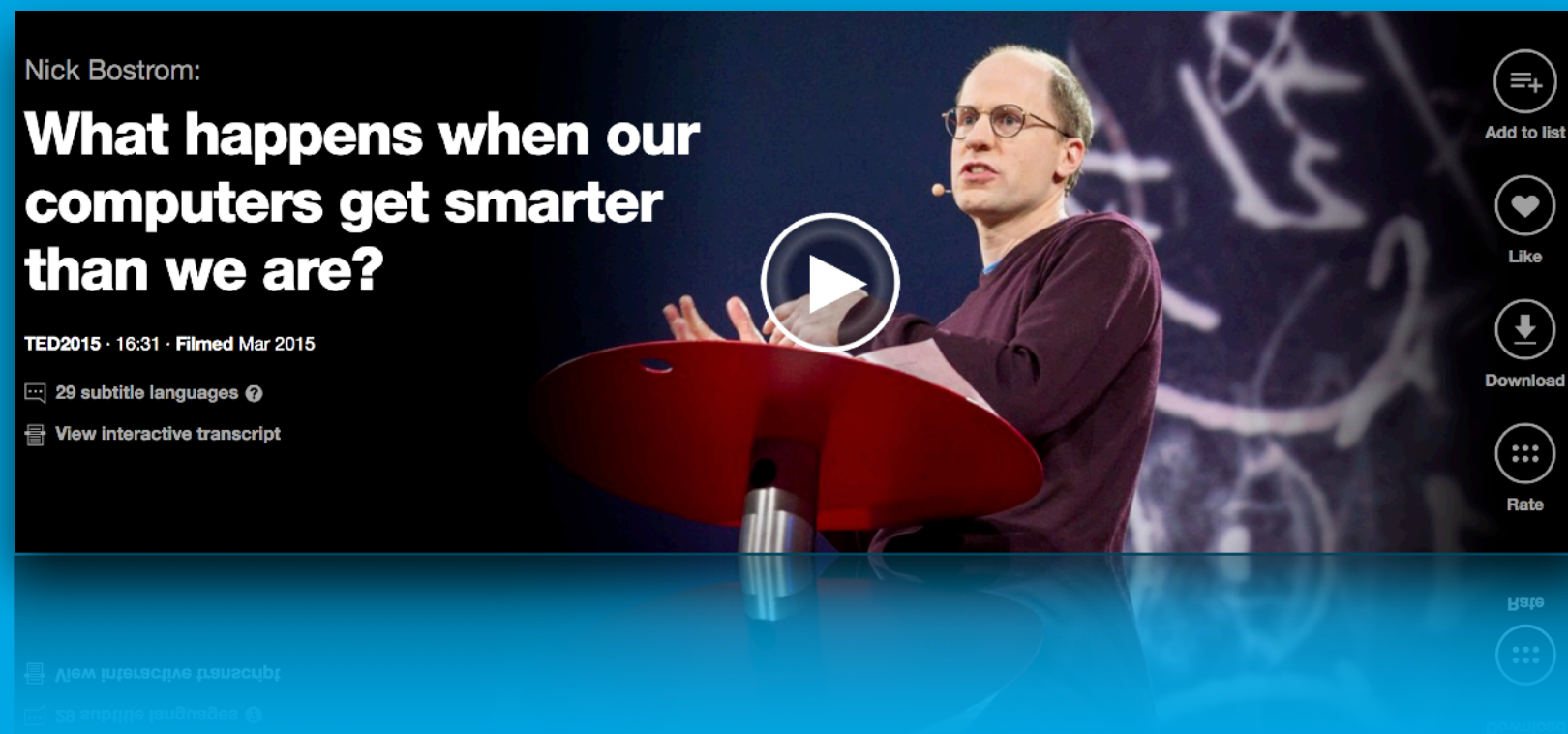
UNIVERSITY CERTIFICATE IN PYTHON FOR ALGORITHMIC TRADING



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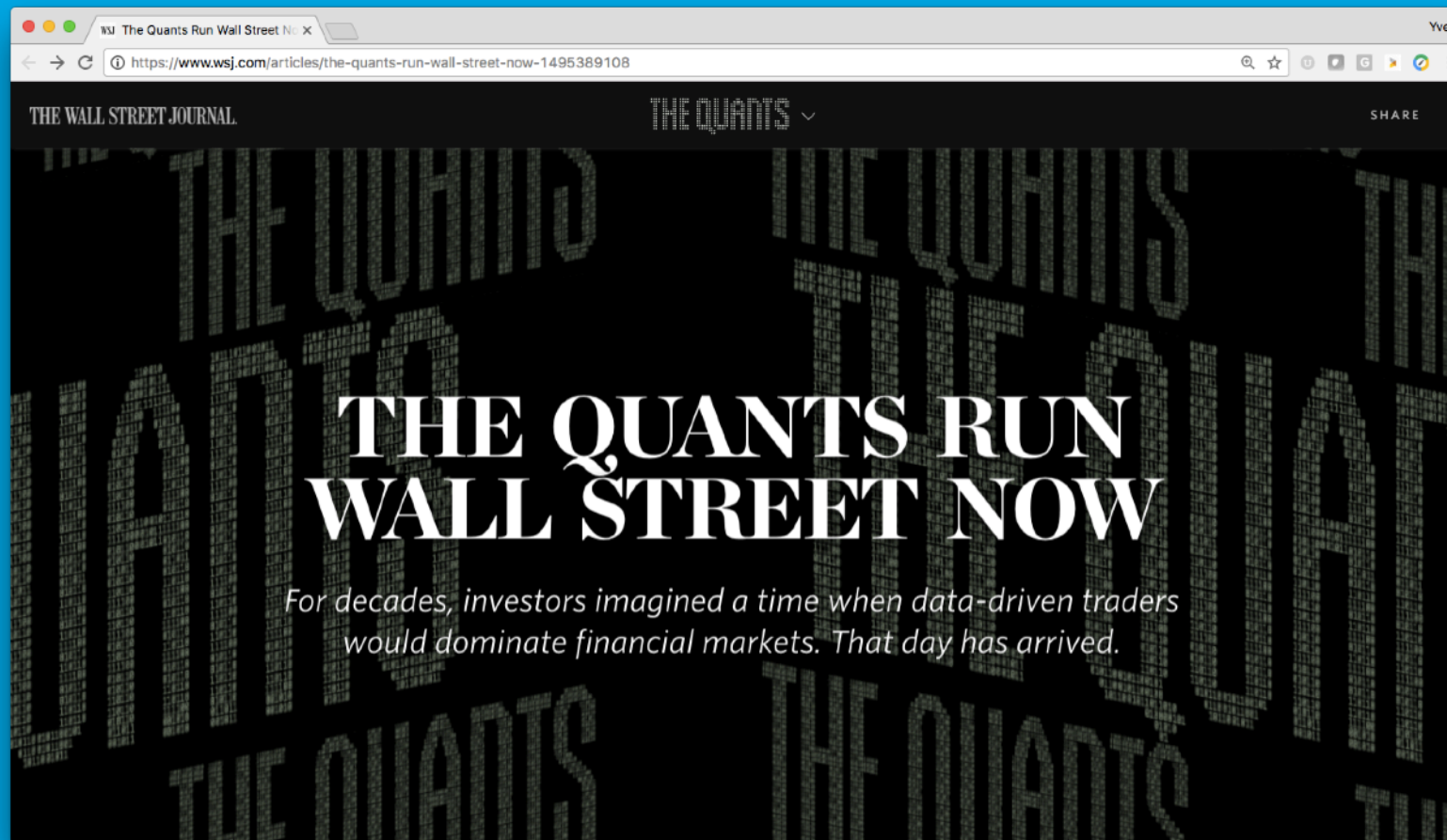
April 2017

What is the Financial Singularity?



“Vast increases in biological and machine intelligences will create what’s being called the Singularity—a threshold of time at which AIs that are at least as smart as humans, and/or augmented human intelligence, radically remake civilization.”

James Miller (2012): Singularity Rising. BenBella Books.



“Financial singularity is the point at which all investment decisions are made by intelligent machines rather than human agents. ... When all human fallibility is eliminated from markets, efficient markets, which have only existed so far in theory, could become a reality.”

Read more: Financial Singularity Definition | Investopedia
<http://www.investopedia.com/terms/f/financial-singularity.asp>

What are Driving Forces in Algorithmic Trading?

machine & deep learning

data
algorithms
hardware

optimization,
training &
learning

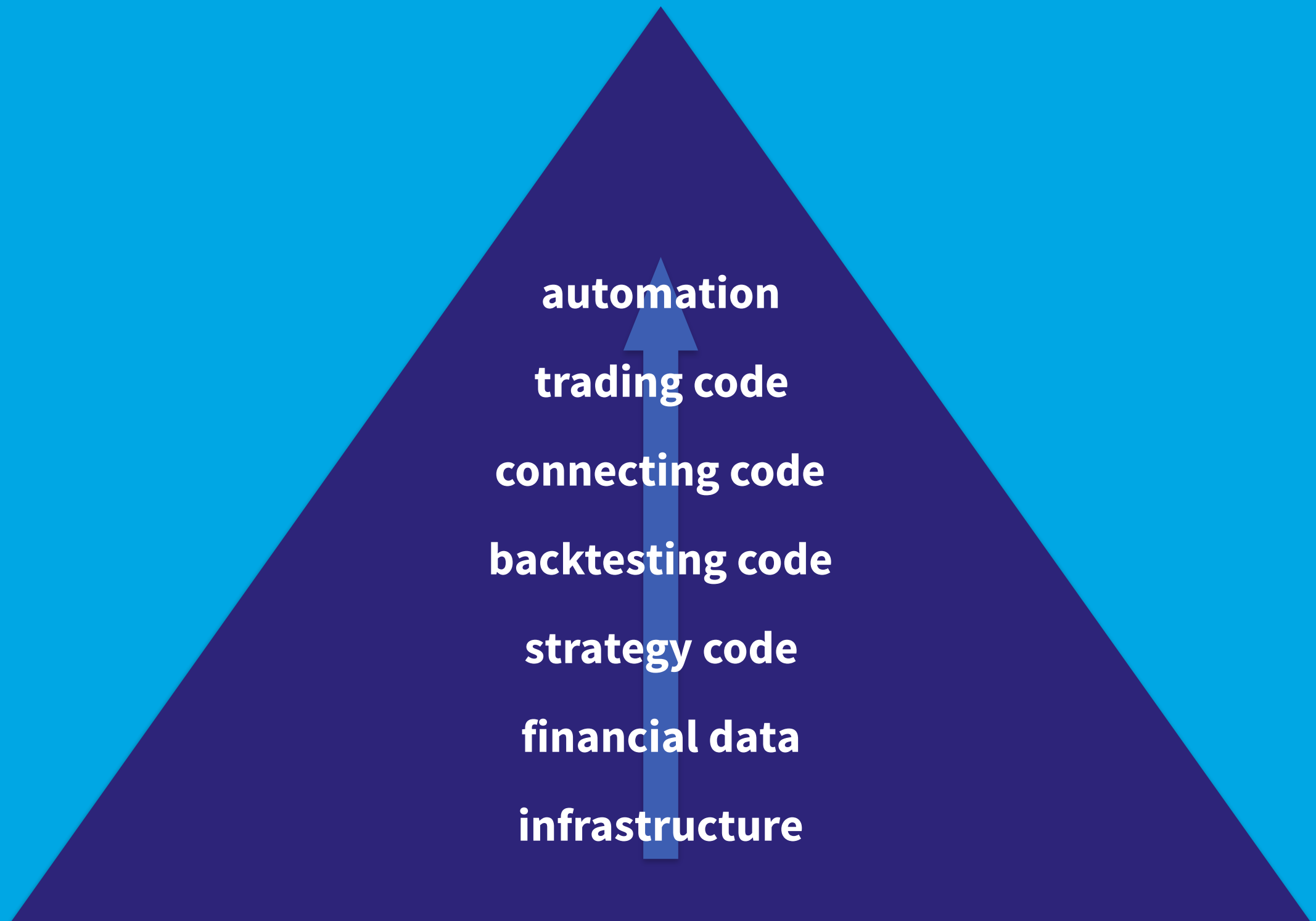
testing
validation

prediction
("self-driving car")

automation

trading
("money making
machine")

algorithmic trading



Humans



Algorithms



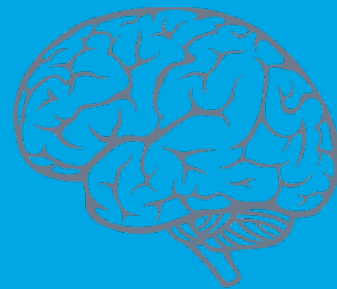
Financial Markets

x



y

Finance History



f(•)



f(x) ≠ y

AI in Finance = finaince

x



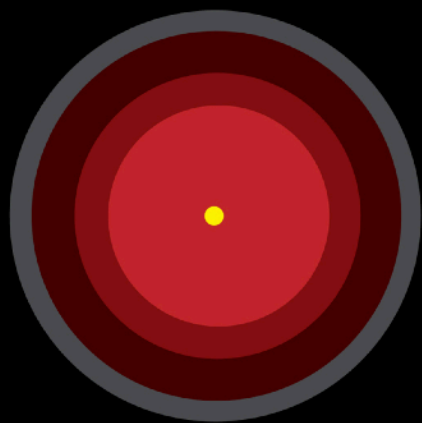
m(•, a, b)



m(x, a*, b*) ≈ y

THE TECHNOLOGICAL SINGULARITY

MURRAY SHANAHAN



THE MIT PRESS ESSENTIAL KNOWLEDGE SERIES

“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)

Is a Financial Singularity Possible?

Dutch Speed-Trader Turns to Currencies After Conquering ETFs

Flow Traders wants to colonize markets with its approach to trading, but its core business is coming under attack

by Will Hadfield

14 June 2017, 06:01 CEST

From **Bloomberg Markets**

The bottom shelf of the fridge is laden with Heineken and Corona. The Corona is on rotation, but the Heineken is a permanent fixture: This is Amsterdam. A few strides away there's a dark, well-stocked in-house pub.

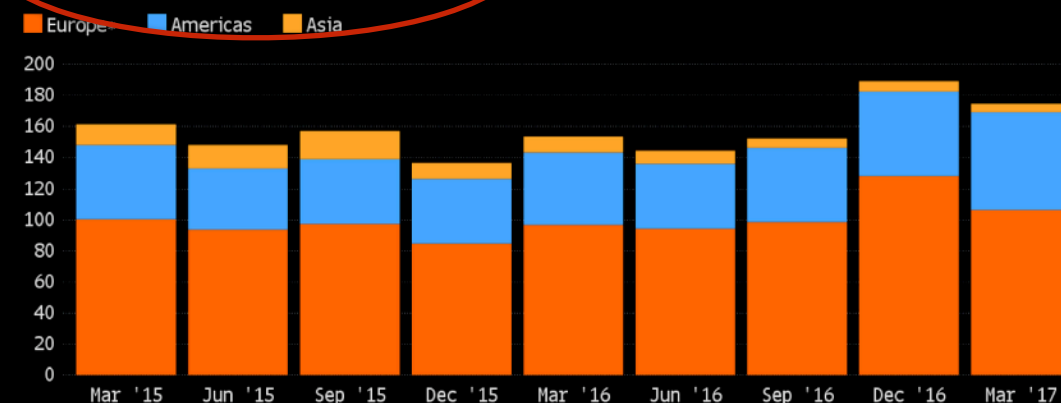
Up one flight of stairs, the atmosphere is very different. Behind a door that can only be opened with a security pass is by far the largest trading floor for exchange-traded funds in Europe. The 110 traders here, along with 30 colleagues in offices elsewhere, traded €640 billion (\$719 billion) in ETFs last year and at least that much in futures, commodities, bonds, stocks, and foreign exchange.

The trading volumes are those of a major Wall Street bank, but the refrigerator—and especially the pub, with its arcade games, pool table, and giant television—is pure startup. This isn't an investment bank; this is Flow Traders NV, one of the world's most successful algorithmic trading firms.

This year the firm will undergo its biggest transformation since it opened for business in 2004. Flow, which handles about a third of all ETF trades in Europe, is seeking to do to currency markets what it's already done to its core business. The firm's strategic calculation is that high-speed foreign exchange traders should be able to offer better prices than banks, which typically adjust their bids and offers based on their customers' creditworthiness and the amount of business they do with the lender.

34 Months Without a Loss

Flow Traders' value traded in exchange-traded funds, billion euros



Source: company
* Includes Middle East and Africa

Bloomberg

Rietberg and Dijkstra say the move into currency trading is a natural evolution of the business. That may be, but Flow also badly needs to find a new way to grow: Its shares languish below €32—the price when it went public almost two years ago. In the first three months of 2017, its profit dropped 41 percent as quiet markets reduced its ability to earn money from trading. What's more, Flow needs to adjust to a changing landscape. In some markets, the pool of income available to algo trading firms is shrinking as competition increases from established trading companies looking to expand into new asset classes.

source: <https://www.bloomberg.com/>

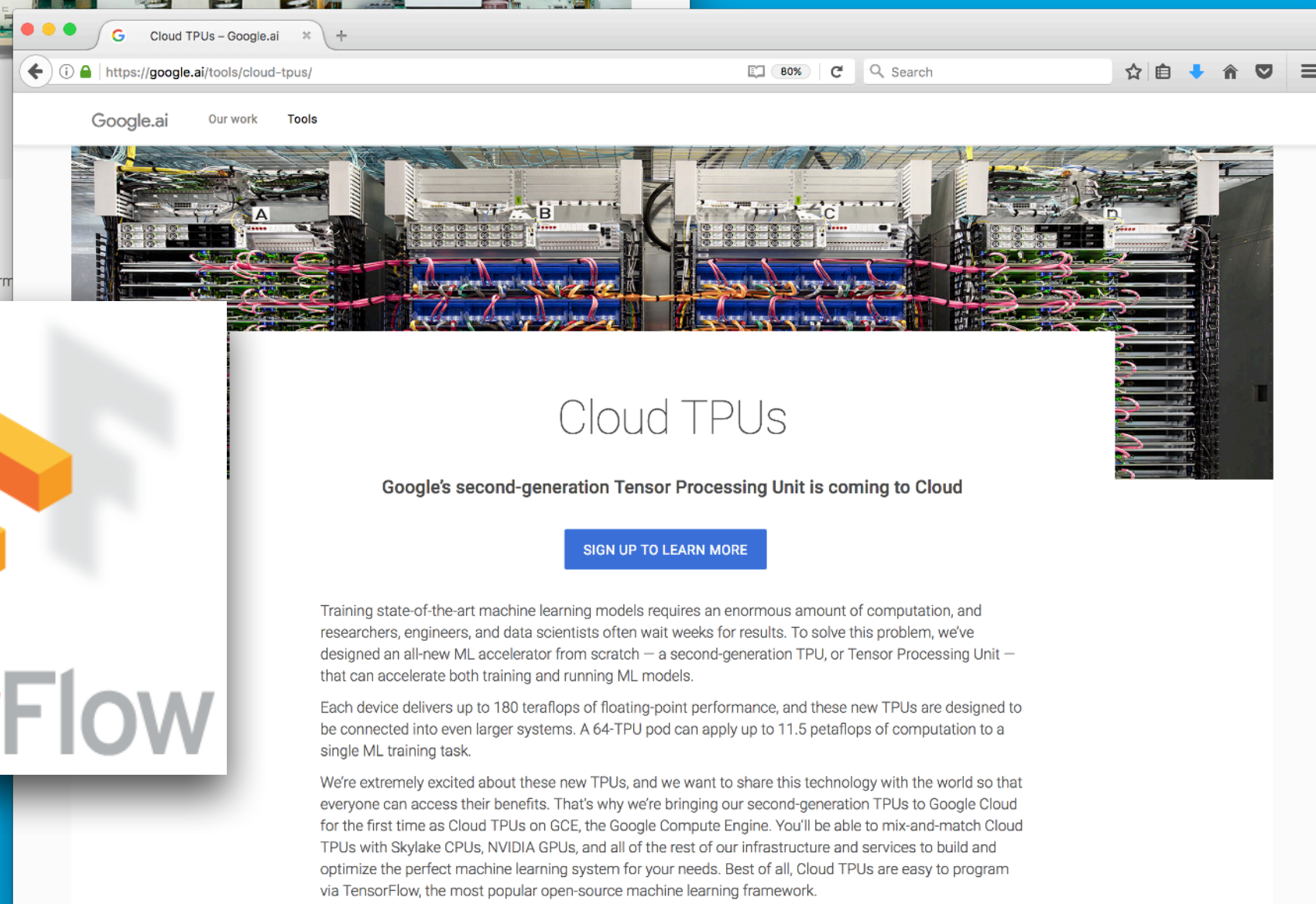
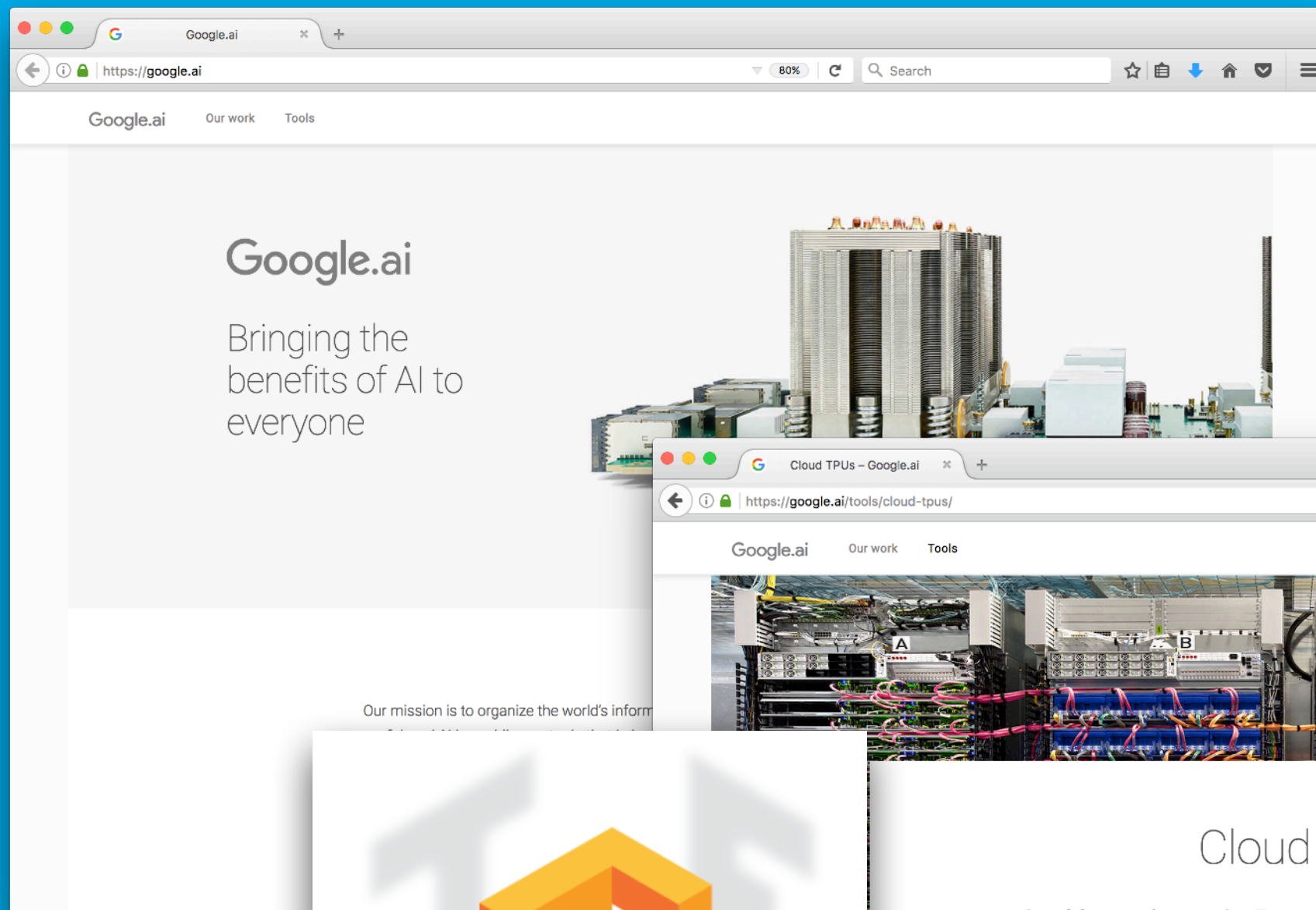
Flow is at a crossroads. Its distinctive approach to algorithmic trading could enable it to colonize other financial markets—or it could shrivel as rivals attack its core ETFs business. “Flow could be multiple times the size it currently is in 20 years,” says Joost de Rijk, an analyst who covers the company for Amsterdam-based merchant bank Kempen & Co. “But it could also be gone. I think they will reevaluate every year whether this is working. That’s the DNA of the company.”

When you make only 0.028 percent on a trade, you need to make a lot of them.

Announcing its first-quarter results in May, Flow reported that it hadn’t lost money on a single trading day in the preceding 34 months. It attributes the stellar run to its use of deterministic modeling, which produces definite outcomes, not probable ones. Most of its rivals calculate prices by means of statistical, or stochastic, modeling, producing hedges that probably (but not definitely) protect them from any downside.

definitely) protect them from any downside.

stochastic, modeling, producing hedges that probably (but not





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