人工智慧投資分析

Artificial Intelligence for Investment Analysis

人工智慧投資分析課程介紹

(Course Orientation on Artificial Intelligence for Investment Analysis)

1071AIIA01
EMBA, IMTKU (M2399) (8540)
Thu 12,13,14 (19:20-22:10) (D503)

Min-Yuh Day
戴敏育
Assistant Professor
專任助理教授
Dept. of Information Management, Tamkang University
淡江大學 資訊管理學系

http://mail. tku.edu.tw/myday/

2018-09-13

人工智慧
投資分析
Artificial Intelligence for Investment Analysis

淡江大學107學年度第1學期
課程教學計畫表
Fall 2018 (2018.09 - 2019.01)

- 課程名稱：人工智慧投資分析 (Artificial Intelligence for Investment Analysis)
- 授課教師：戴敏育 (Min-Yuh Day)
- 開課系級：資管所碩專班 (TLMXJ1A)
- 開課資料：選修 單學期 3 學分 (3 Credits, Elective)
- 上課時間：週五 12,13,14 (Thu 19:20-22:10)
- 上課教室： D503 (淡江大學台北校園)

淡江大學

資訊管理學系

資訊技術

管理思維

IMTKU

淡江大學資訊管理系(所)教育目標

Tamkang University 淡江大學

- 培育能整合資訊技術、管理技能及具有解決問題能力的高等資訊管理實務人才。

淡江大學資訊管理系(所)核心能力

Tamkang University 淡江大學

- A. 現代管理知識應用。
- B. 邏輯思考。
- C. 關鍵分析。
- D. 結合資訊技術與管理。
- E. 研究與創新。
- F. 資料分析與應用。
- G. 資通安全管理。
- H. 言辭與文字表達。

課程簡介

- 本課程介紹人工智慧投資分析基本概念與研究議題
- 課程內容包括
  - AI 金融科技: 金融服務創新應用
  - 機器人理財顧問與AI交談機器人
  - 投資心理學與行為財務學
  - 財務金融事件研究法
  - Python AI投資分析基礎
  - Pandas量化投資分 析
  - Python Scikit-Learn 機器學習
  - TensorFlow 深度學習財務時間序列預 測
  - 投資組合最佳化與程式交易
  - 自然語言處理
  - 人工智慧投資分析個案研究

Course Introduction

- This course introduces the fundamental concepts and research issues of artificial intelligence for investment analysis.
- Topics include
  - AI in FinTech: Financial Services Innovation and Application
  - Robo-Advisors and AI Chatbots
  - Investing Psychology and Behavioral Finance
  - Event Studies in Finance
  - Foundations of AI Investment Analysis in Python
  - Quantitative Investing with Pandas in Python
  - Machine Learning with Scikit-Learn In Python
  - Deep Learning for Financial Time Series Forecasting with TensorFlow
  - Case Study on Artificial Intelligence for Investment Analysis

課程目標
(Objective)

- 瞭解及應用人工智慧投資分析基本概念與研究議題。
  (Understand and apply the fundamental concepts and research issues of Artificial Intelligence for Investment Analysis.)
- 進行人工智慧投資分析相關之資訊管理研究。
  (Conduct information systems research in the context of Artificial Intelligence for Investment Analysis.)

課程大綱 (Syllabus)

週次 (Week)	日期 (Date)	內容 (Subject/Topics)
1	2018/09/13	人工智慧投資分析課程介紹 (Course Orientation on Artificial Intelligence for Investment Analysis)
2	2018/09/20	AI 金融科技: 金融服務創新應用 (AI in FinTech: Financial Services Innovation and Application)
3	2018/09/27	機器人理財顧問與AI交談機器人 (Robo-Advisors and AI Chatbots)
4	2018/10/04	投資心理學與行為財務學 (Investing Psychology and Behavioral Finance)
5	2018/10/11	財務金融事件研究法 (Event Studies in Finance)
6	2018/10/18	人工智慧投資分析個案研究 I (Case Study on Artificial Intelligence for Investment Analysis I)

課程大綱 (Syllabus)

週次 (Week)　日期 (Date)　內容 (Subject/Topics)

7 2018/10/25 Python AI投資分析基礎
(Foundations of AI Investment Analysis in Python)

8 2018/11/01 Python Pandas量化投資分析
(Quantitative Investing with Pandas in Python)

9 2018/11/08 Python Scikit-Learn 機器學習
(Machine Learning with Scikit-Learn In Python)

10 2018/11/15 期中報告 (Midterm Project Report)

11 2018/11/22 TensorFlow 深度學習財務時間序列預測 I
(Deep Learning for Financial Time Series Forecasting with TensorFlow I)

12 2018/11/29 TensorFlow 深度學習財務時間序列預測 II
(Deep Learning for Financial Time Series Forecasting with TensorFlow II)

課程大綱 (Syllabus)

週次 (Week)　日期 (Date)　內容 (Subject/Topics)

13 2018/12/06 人工智慧投資分析個案研究 II
(Case Study on Artificial Intelligence for Investment Analysis II)

14 2018/12/13 TensorFlow 深度學習財務時間序列預測 III
(Deep Learning for Financial Time Series Forecasting with TensorFlow III)

15 2018/12/20 投資組合最佳化與程式交易
(Portfolio Optimization and Algorithmic Trading)

16 2018/12/27 自然語言處理 (Natural Language Processing)

17 2019/01/03 期末報告 I (Final Project Presentation I)

18 2019/01/10 期末報告 II (Final Project Presentation II)

教學方法與評量方法

- 教學方法

  —講述、討論、
  賞析、模擬、
  問題解決、實作

- 評量方法

  —實作、報告、上課表現

教材課本

- 教材課本
  - 講義 (Slides)
  - 人工智慧投資分析相關個案與論文
    (Cases and Papers related to
    Artificial Intelligence for Investment Analysis)

參考書籍 (References)

1. Paolo Sironi (2016), FinTech Innovation: From Robo-Advisors to Goal Based Investing and Gamification, Wiley.
2. Doron Kliger and Gregory Gurevich (2014), Event Studies for Financial Research: A Comprehensive Guide, Palgrave Macmillan.
3. Yves Hilpisch (2014), Python for Finance: Analyze Big Financial Data, OReilly Media.
4. Yves Hilpisch (2015), Derivatives Analytics with Python: Data Analysis, Models, Simulation, Calibration and Hedging, Wiley.
5. Yuxing Yan (2017), Python for Finance: Apply powerful finance models and quantitative analysis with Python, Second Edition, Packt Publishing.
6. Aurélien Géron (2017), Hands-On Machine Learning with Scikit-Learn and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems, O'Reilly Media.

作業與學期成績計算方式

- 作業篇數
  - 3篇
- 學期成績計算方式
  - ☑期中評量：30 %
  - ☑期末評量：30 %
  - ☑其他（課堂參與及報告討論表現）：40 %

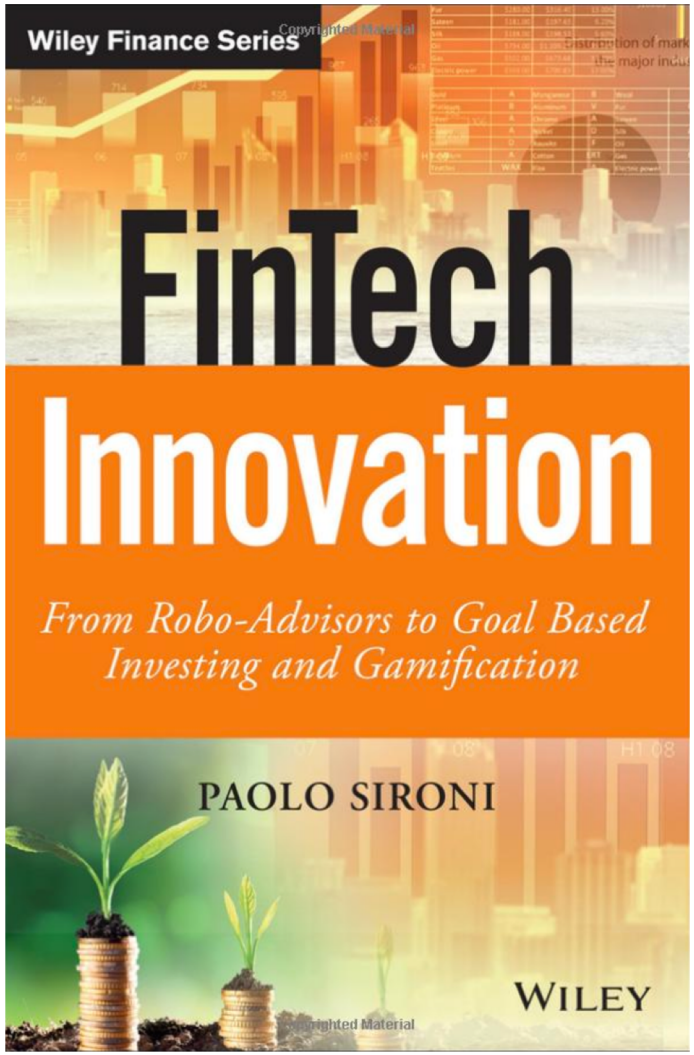
AI and Big Data Analytics in Finance

- 金融科技 (Spring 2017) (EMBA IMTKU)
  - (Financial Technology, FinTech)
- 財務金融大數據分析 (Fall 2017) (EMBA IMTKU)
  - Big Data Analytics in Finance
- 人工智慧投資分析 (Fall 2018) (EMBA IMTKU)
  - Artificial Intelligence for Investment Analysis
- 人工智慧與財務應用
  - Artificial Intelligence and Financial Application
- 投資大數據分析
  - Big Data Analytics in Investment

Paolo Sironi (2016)

FinTech Innovation:

From Robo-Advisors to Goal Based Investing and Gamification, Wiley



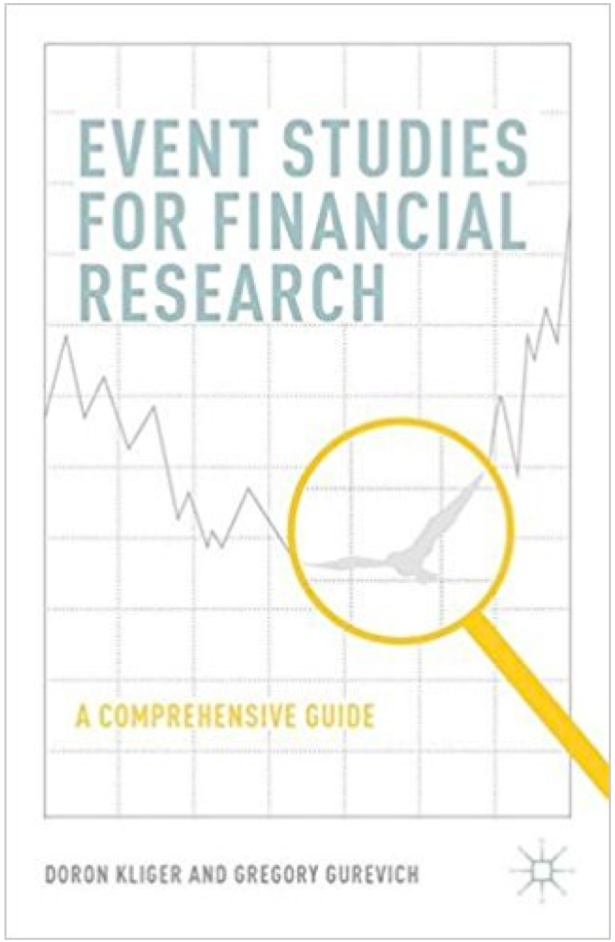
Source: https://www.amazon.com/FinTech-Innovation-Robo-Advisors-Investing-Gamification/dp/1119226988

Doron Kliger and Gregory Gurevich (2014),

Event Studies for Financial Research:

A Comprehensive Guide,

Palgrave Macmillan



Source: https://www.amazon.com/Event-Studies-Financial-Research-Comprehensive/dp/1137435380/

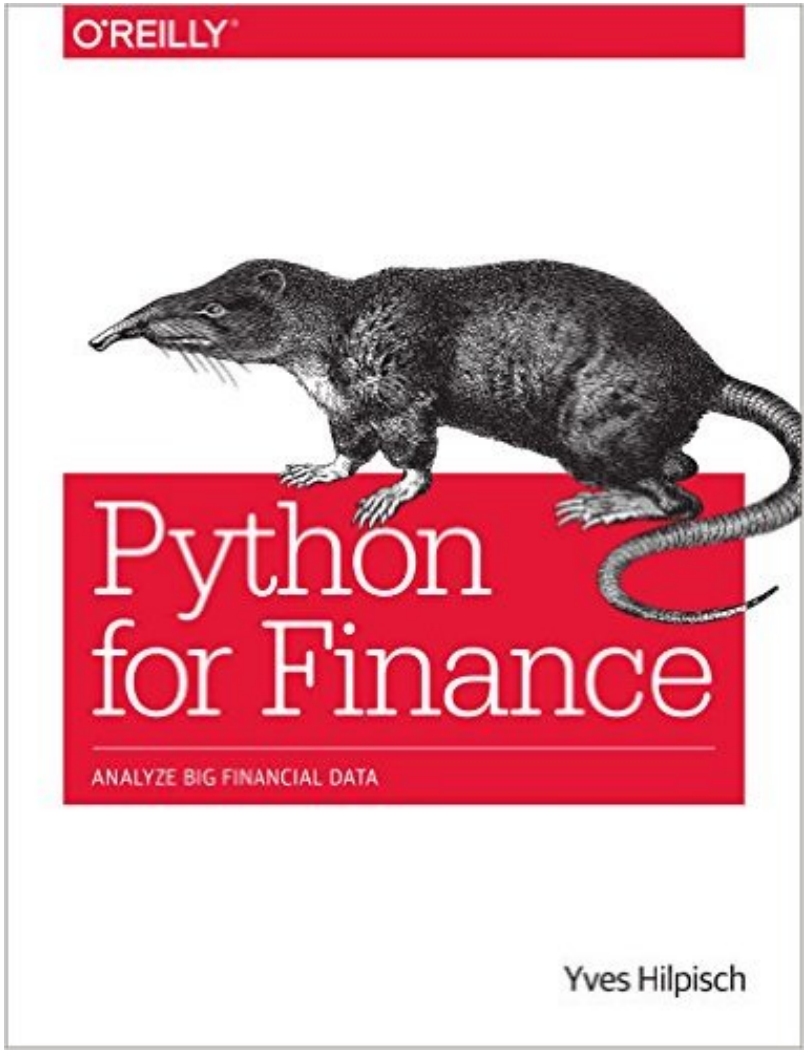
沈中華、李建然 (2000),

事件研究法：

財務與會計實證研究必備

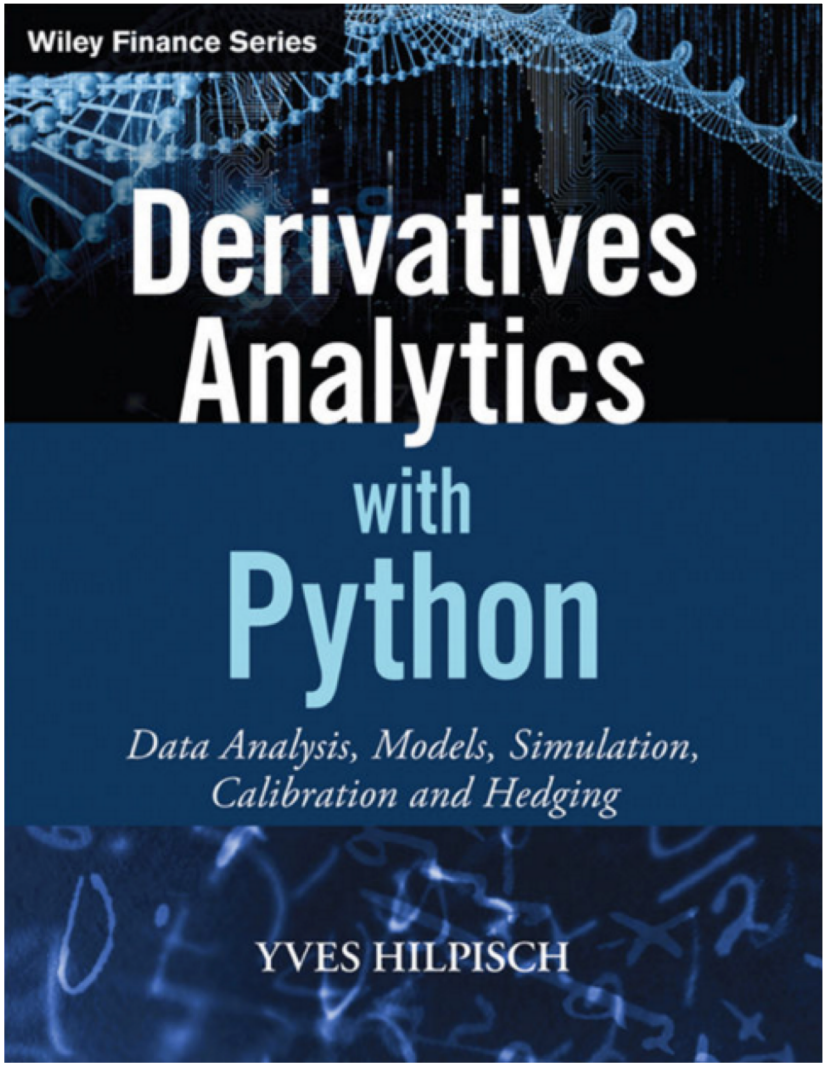
Source: 沈中華、李建然 (2000)，事件研究法：財務與會計實證研究必備，華泰文化

Yves Hilpisch (2014), Python for Finance: Analyze Big Financial Data, O'Reilly



Source: http://www.amazon.com/Python-Finance-Analyze-Financial-Data/dp/1491945281

Yves Hilpisch (2015),
Derivatives Analytics with Python:
Data Analysis, Models, Simulation, Calibration and Hedging, Wiley

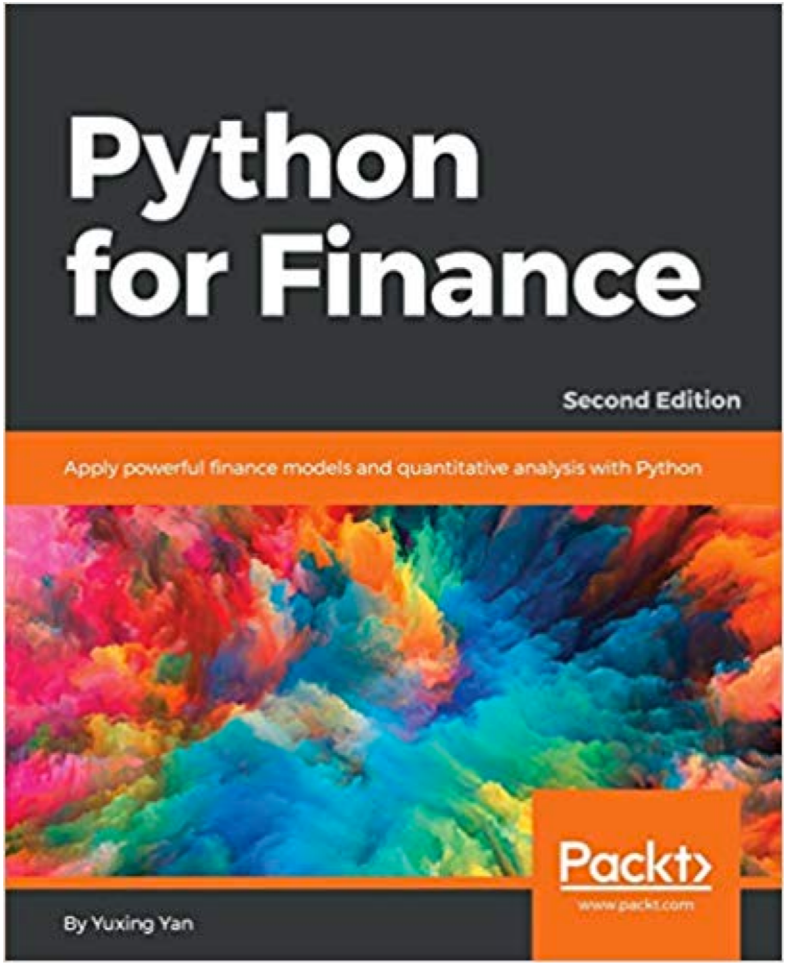


Source: http://www.amazon.com/Derivatives-Analytics-Python-Simulation-Calibration/dp/1119037999/

Yuxing Yan (2017),

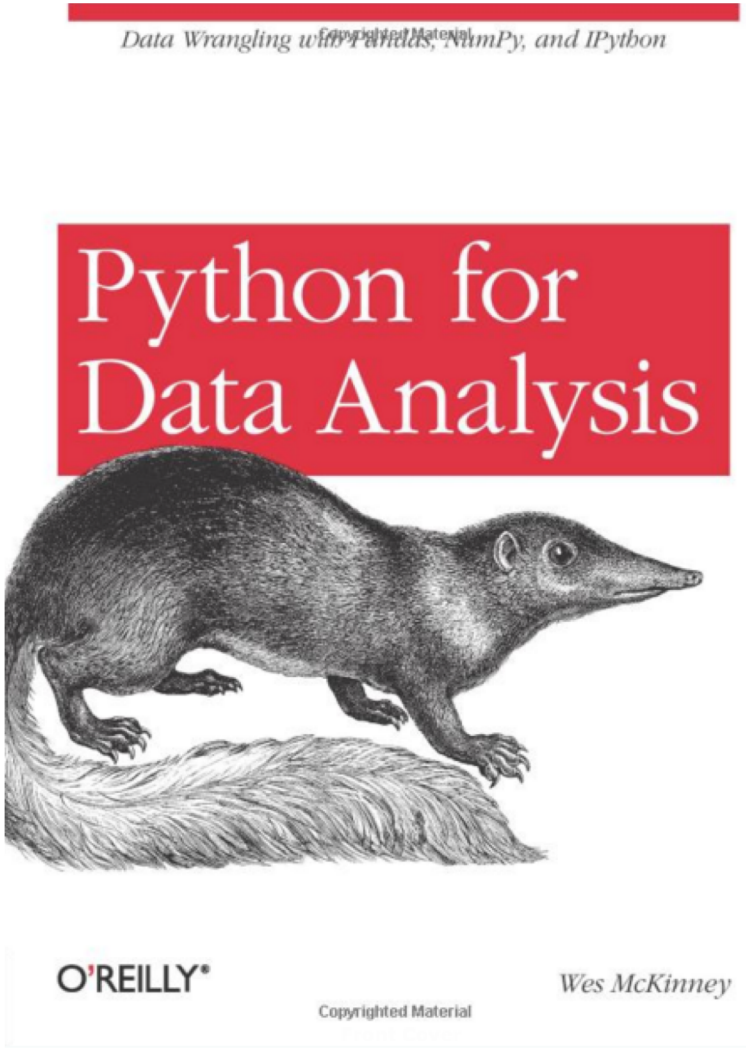
Python for Finance: Apply powerful finance models and quantitative analysis with Python,

Second Edition, Packt Publishing



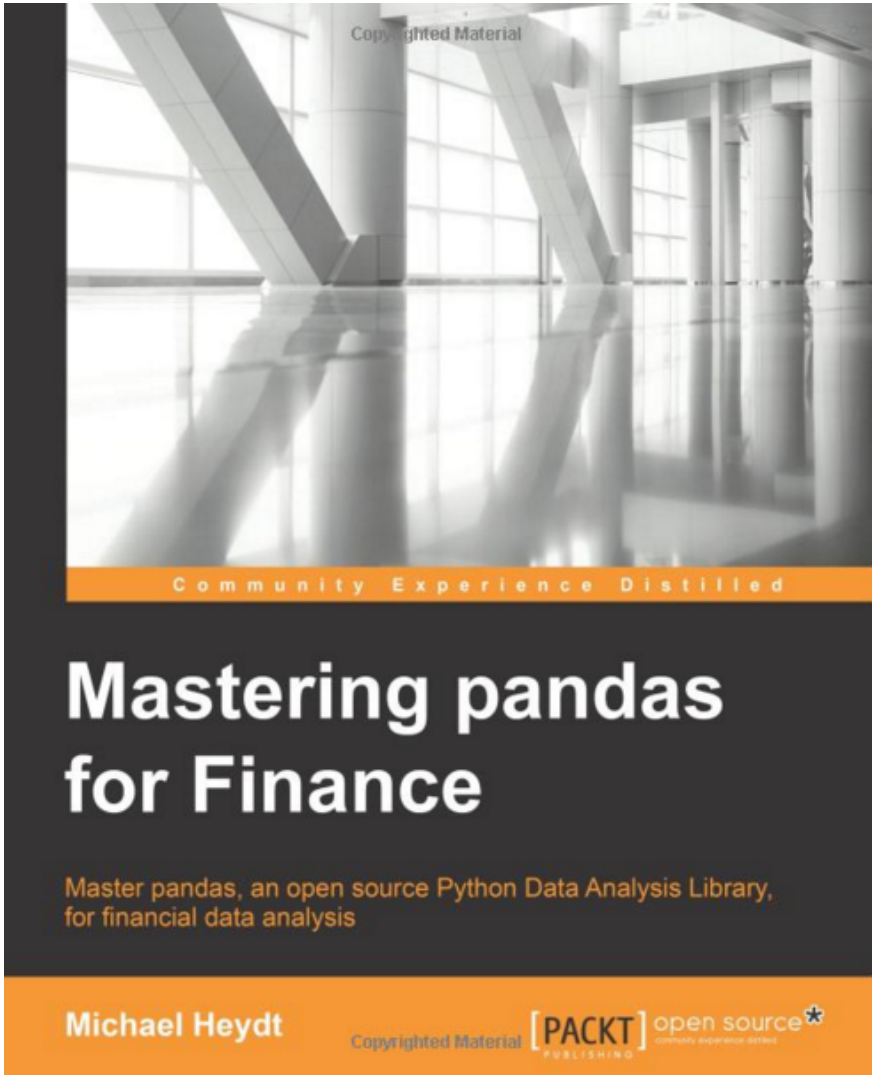
Source: https://www.amazon.com/Python-Finance-powerful-quantitative-analysis/dp/1787125696

Wes McKinney (2012), Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython, O'Reilly Media



Source: http://www.amazon.com/Python-Data-Analysis-Wrangling-IPython/dp/1449319793/

Michael Heydt (2015), Mastering Pandas for Finance, Packt Publishing

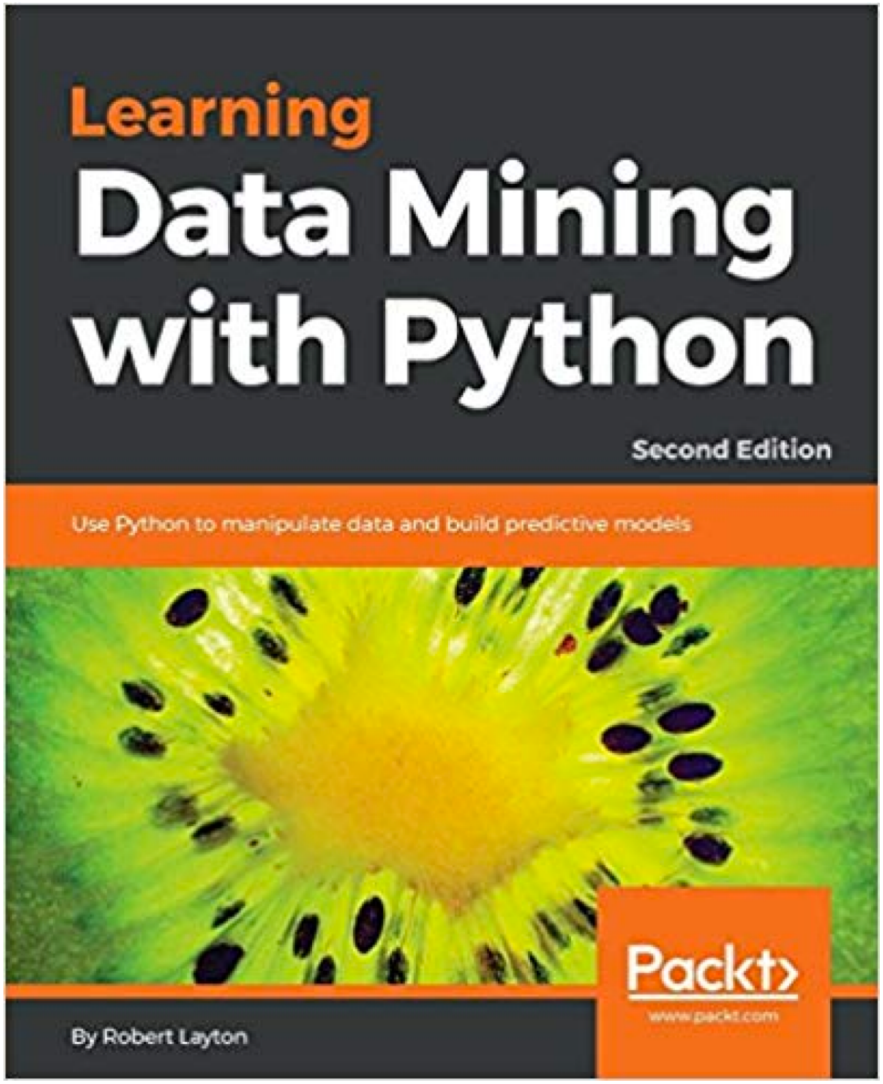


Source: http://www.amazon.com/Mastering-Pandas-Finance-Michael-Heydt/dp/1783985100

Robert Layton (2017),

Learning Data Mining with Python - Second Edition,

Packt Publishing

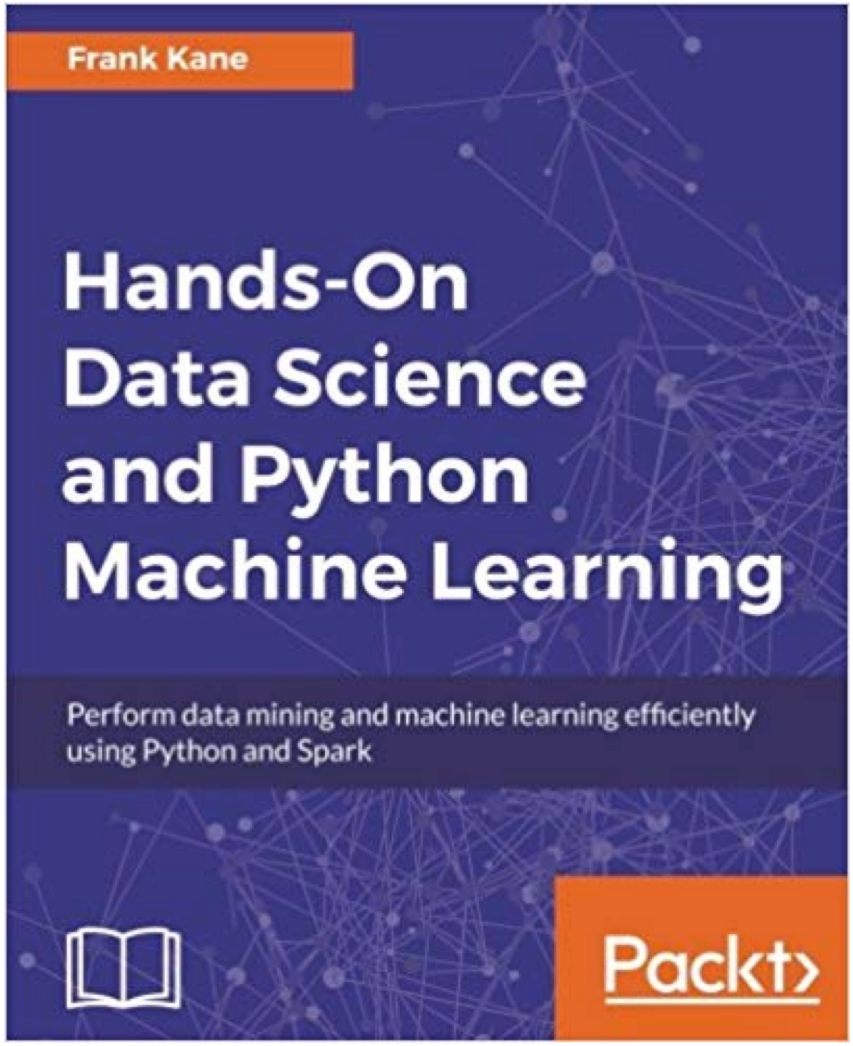


Source: https://www.amazon.com/Learning-Data-Mining-Python-Second/dp/1787126781

Frank Kane (2017),

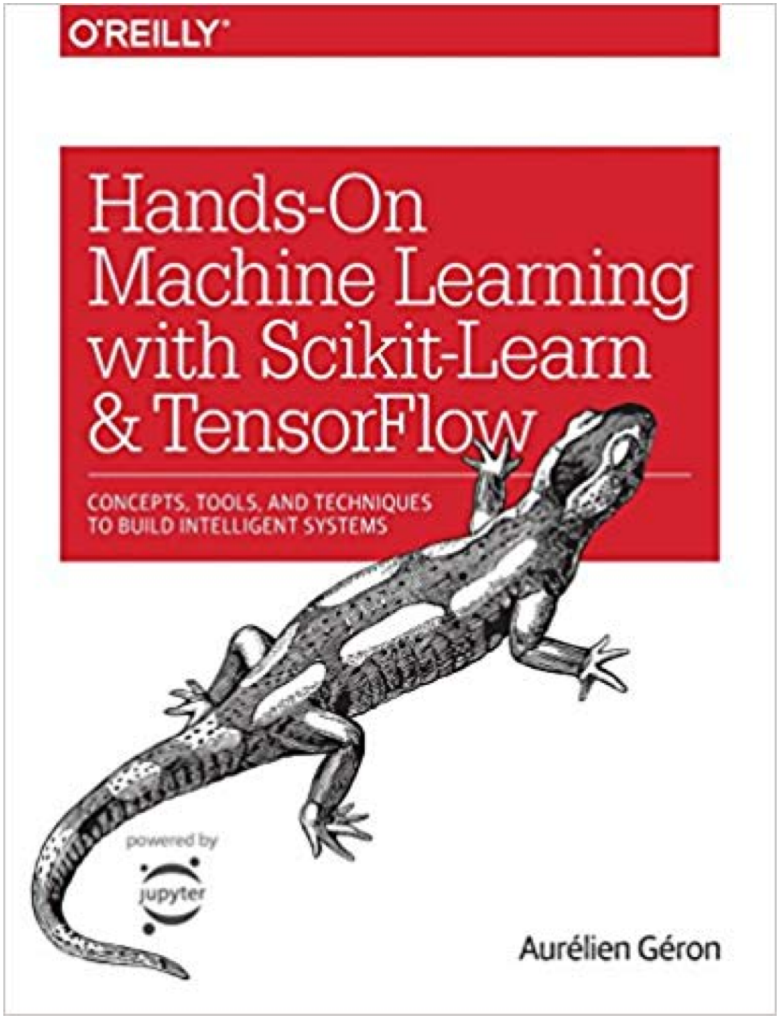
Hands-On Data Science and Python Machine Learning: Perform data mining and machine learning efficiently using Python and Spark,

Packt Publishing

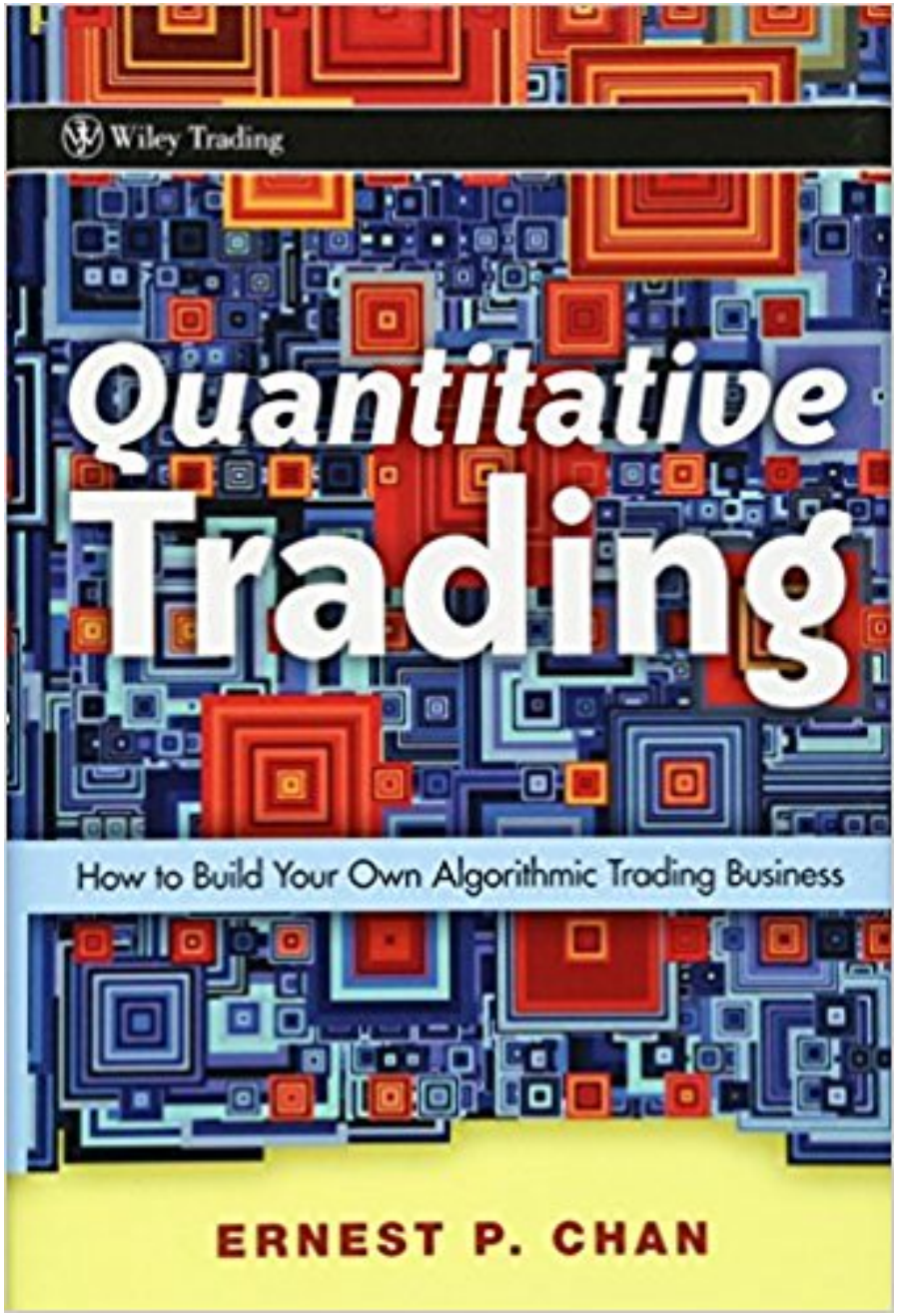


Source: https://www.amazon.com/Hands-Science-Python-Machine-Learning/dp/1787280748

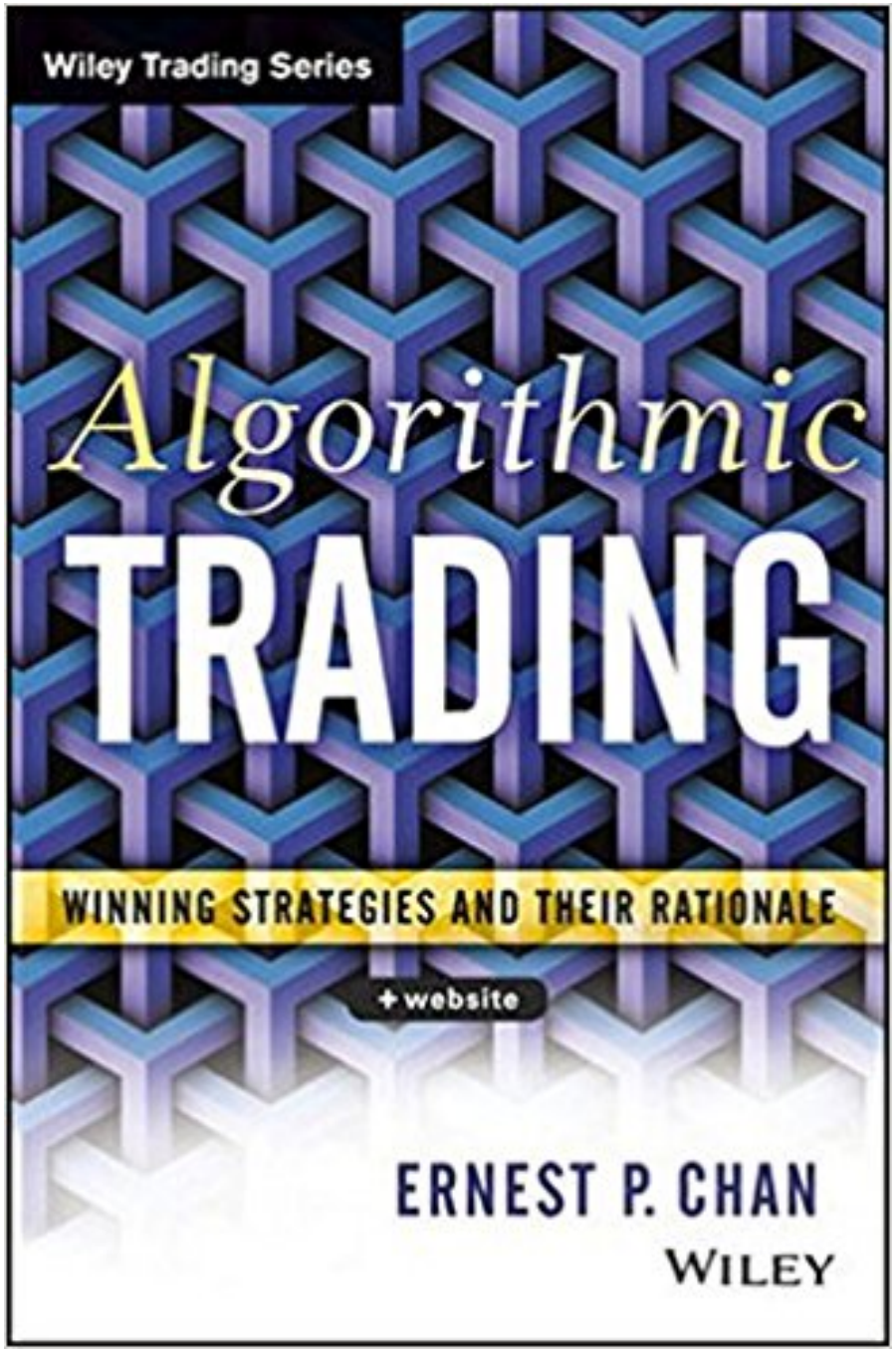
Aurélien Géron (2017),
Hands-On Machine Learning with Scikit-Learn and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems, O'Reilly Media, 2017



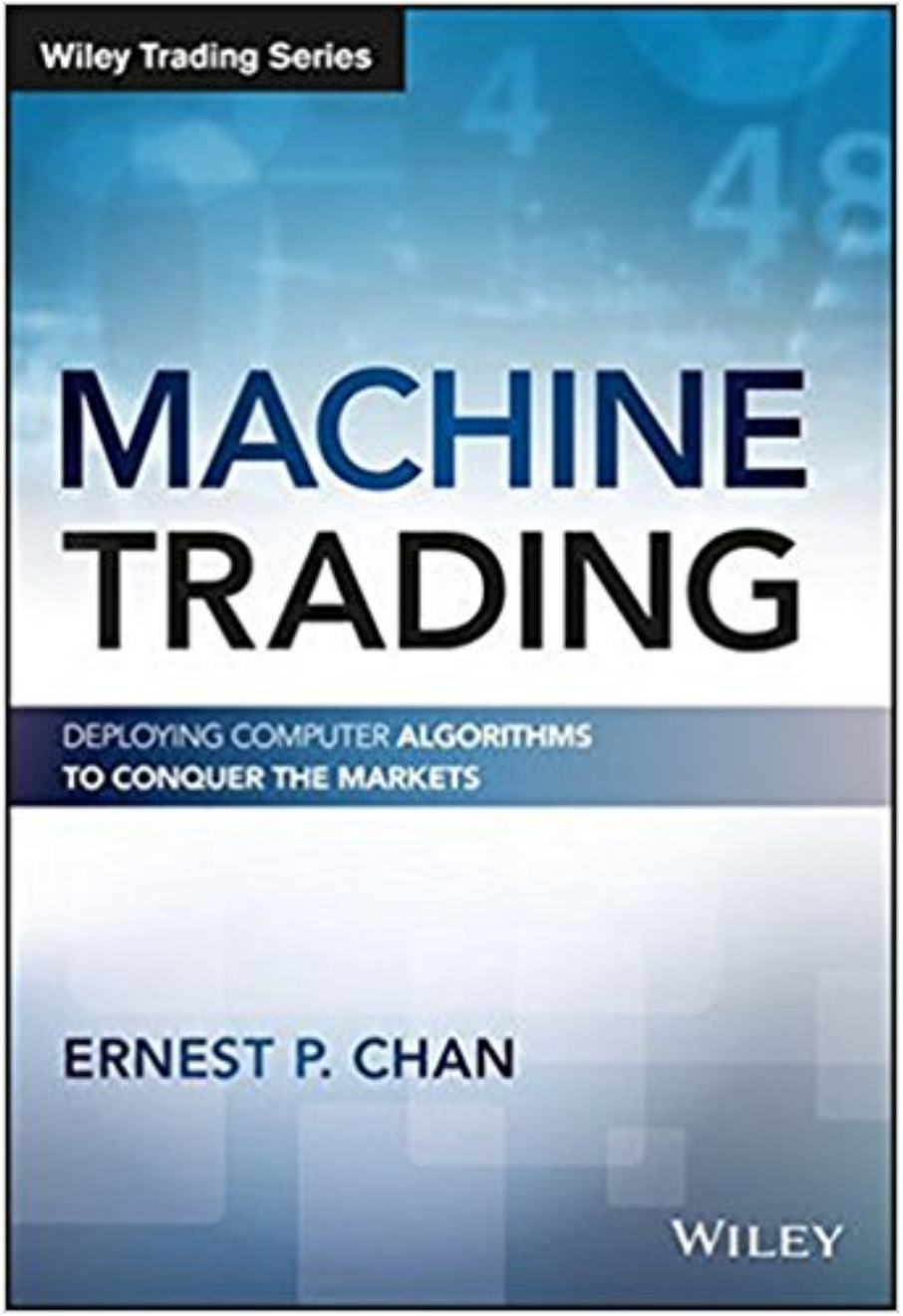
Source: https://www.amazon.com/Hands-Machine-Learning-Scikit-Learn-TensorFlow/dp/1491962291



Source: Ernie Chan (2008), “Quantitative Trading: How to Build Your Own Algorithmic Trading Business”, Wiley

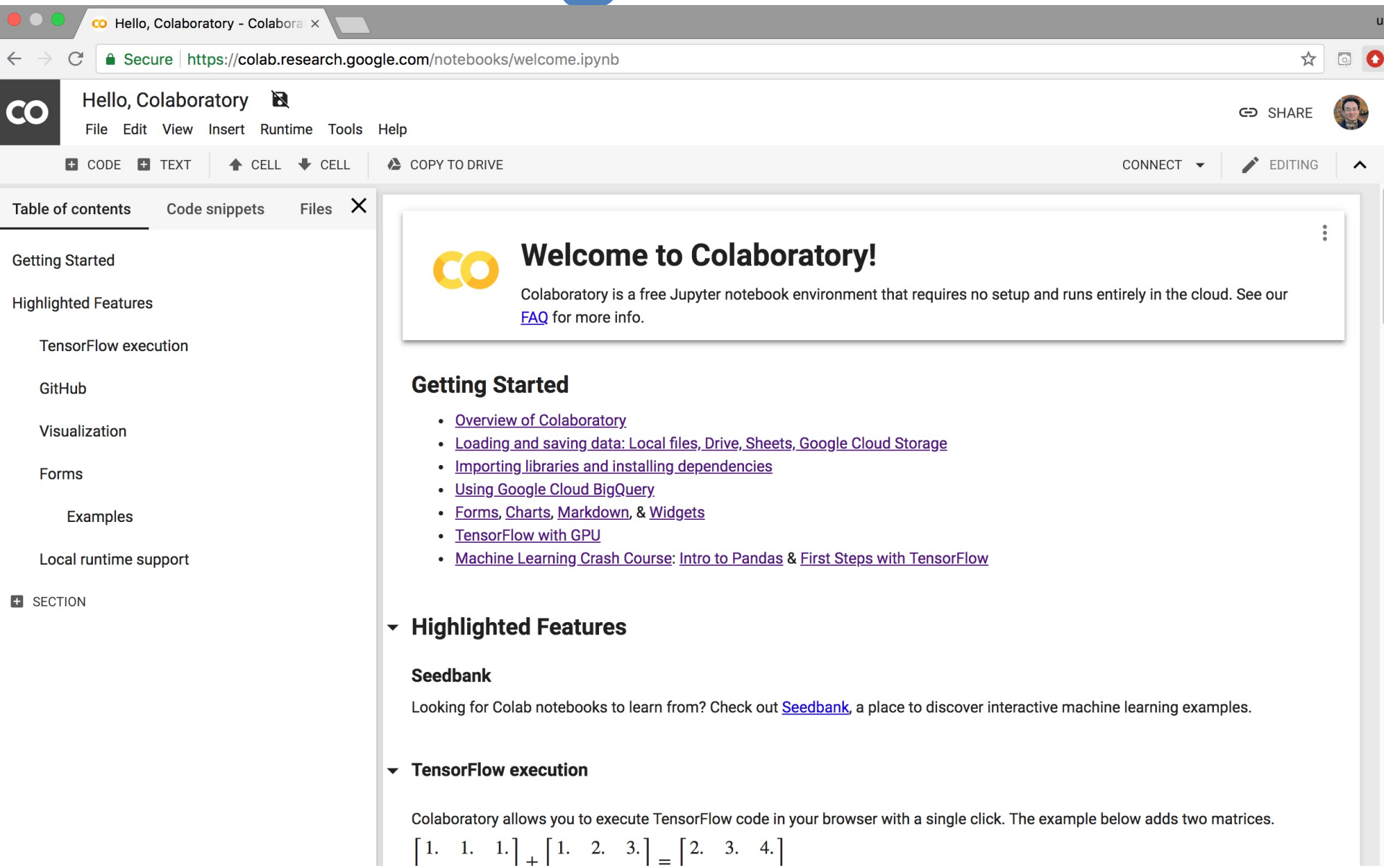


Source: Ernie Chan (2013), “Algorithmic Trading: Winning Strategies and Their Rationale”, Wiley



Source: Ernest P. Chan (2017), “Machine Trading: Deploying Computer Algorithms to Conquer the Markets”, Wiley

Google Colab



https://colab.research.google.com/notebooks/welcome.ipynb

FinTech

Financial Technology

FinTech

Financial Technology
FinTech

"providing
financial services
by making use of
software and
modern technology"

Source: https://www.fintechweekly.com/fintech-definition

Financial Services

Financial Services

Source: http://www.crackitt.com/7-reasons-why-your-fintech-startup-needs-visual-marketing/

Financial Revolution with Fintech

A financial services revolution

Consumer Trends

1. Simplification

2. Transparency

3. Analytics

4. Reduced Friction

Source: http://www.hedgethink.com/fintech/european-fintech-top-100/

FinTech: Financial Services Innovation

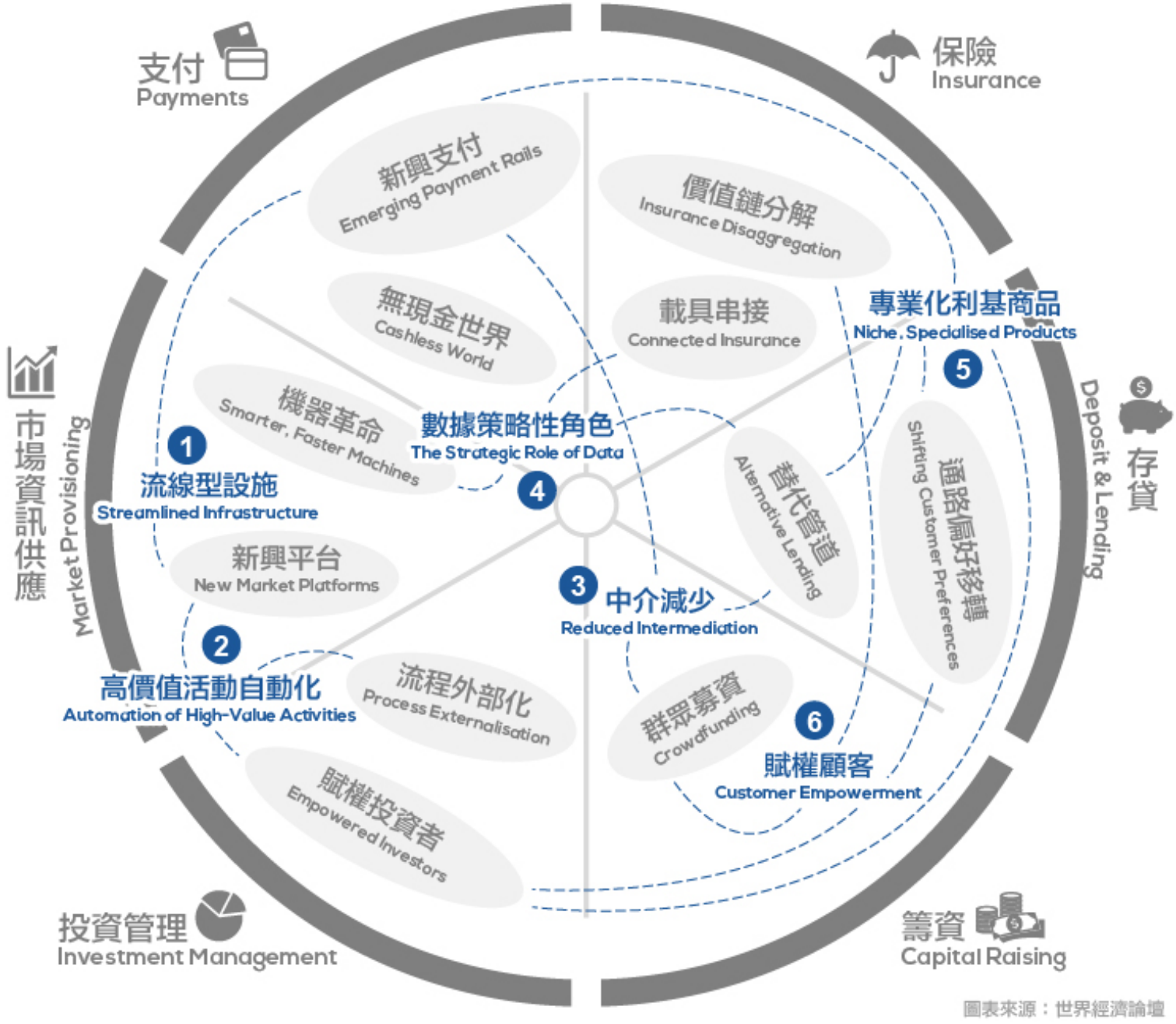
Source: http://www3.weforum.org/docs/WEF_The_future__of_financial_services.pdf

FinTech:

Financial Services Innovation

1. Payments
2. Insurance
3. Deposits & Lending
4. Capital Raising
5. Investment Management
6. Market Provisioning

Source: http://www3.weforum.org/docs/WEF_The_future__of_financial_services.pdf



圖表來源：世界經濟論壇

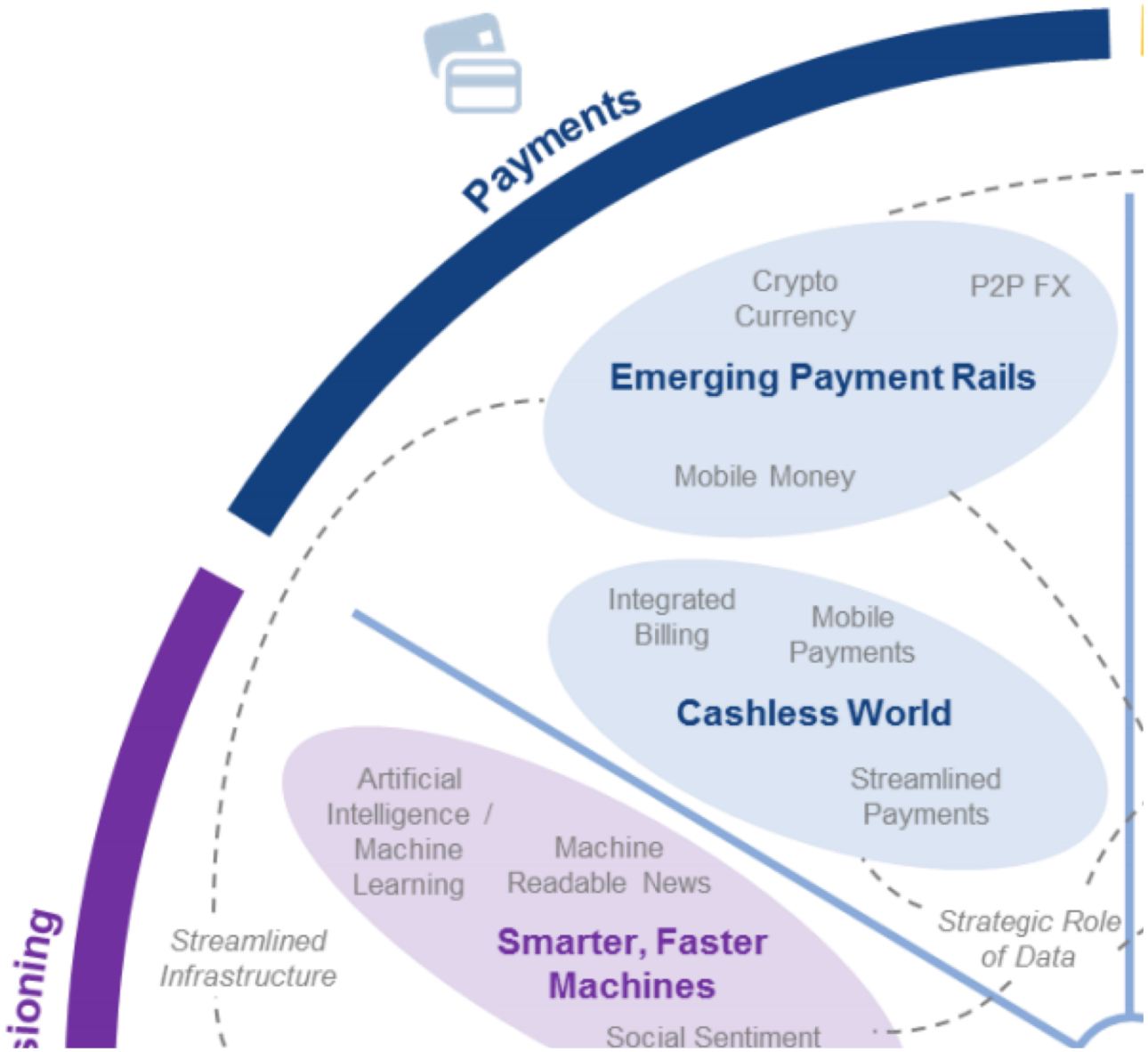
Source: https://www.stockfeel.com.tw/2015年世界經濟論壇－未來的金融服務/

FinTech: Financial Services Innovation

圖表來源：Fugle團隊整理

Source: https://www.stockfeel.com.tw/2015年世界經濟論壇－未來的金融服務/

1 FinTech: Payment



Source: http://www3.weforum.org/docs/WEF_The_future__of_financial_services.pdf

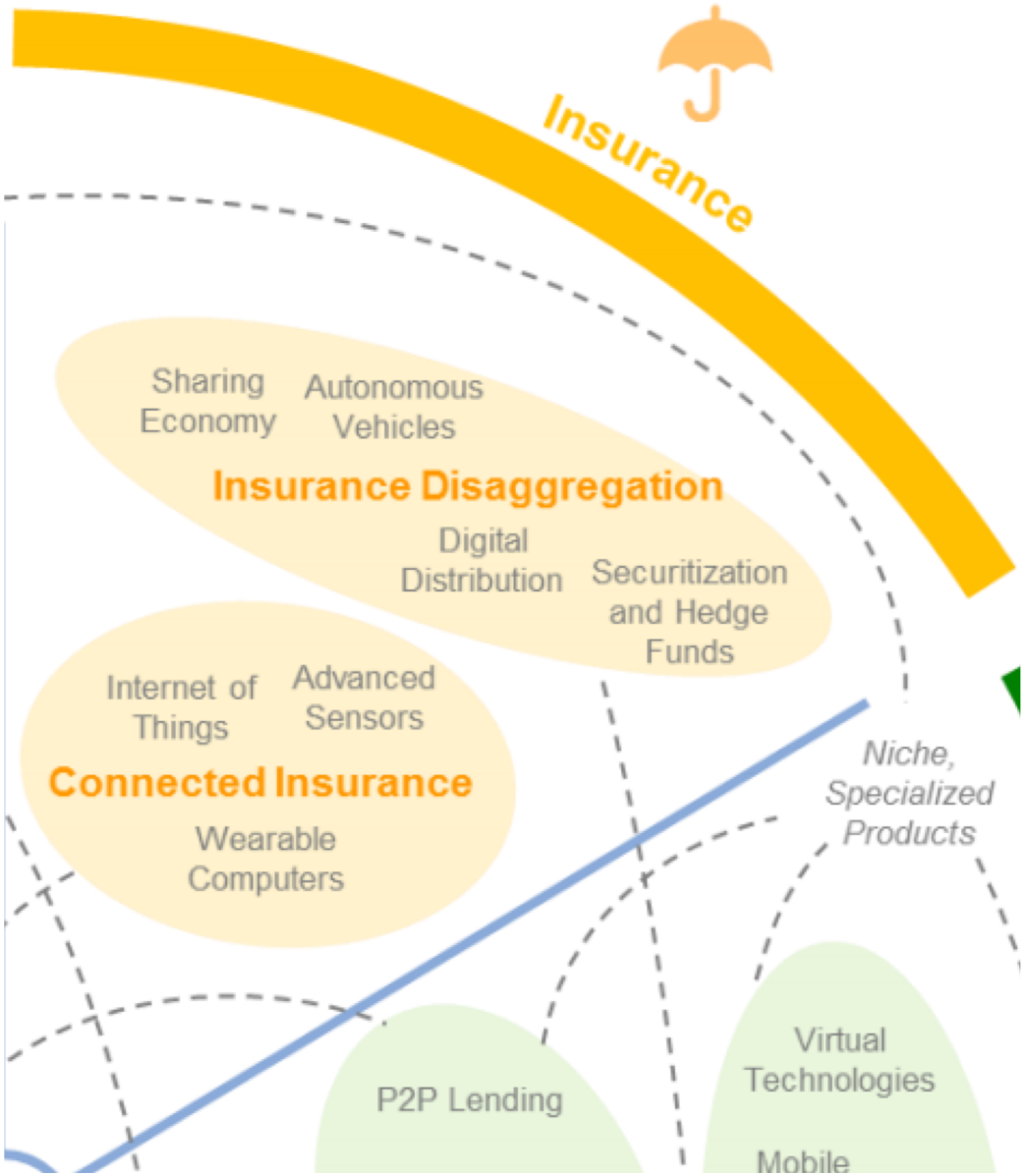
1 FinTech: Payment Cashless World Emerging Payment Rails

圖表來源：Fugle團隊整理

Source: https://www.stockfeel.com.tw/2015年世界經濟論壇－未來的金融服務/

2

FinTech: Insurance



Source: http://www3.weforum.org/docs/WEF_The_future__of_financial_services.pdf

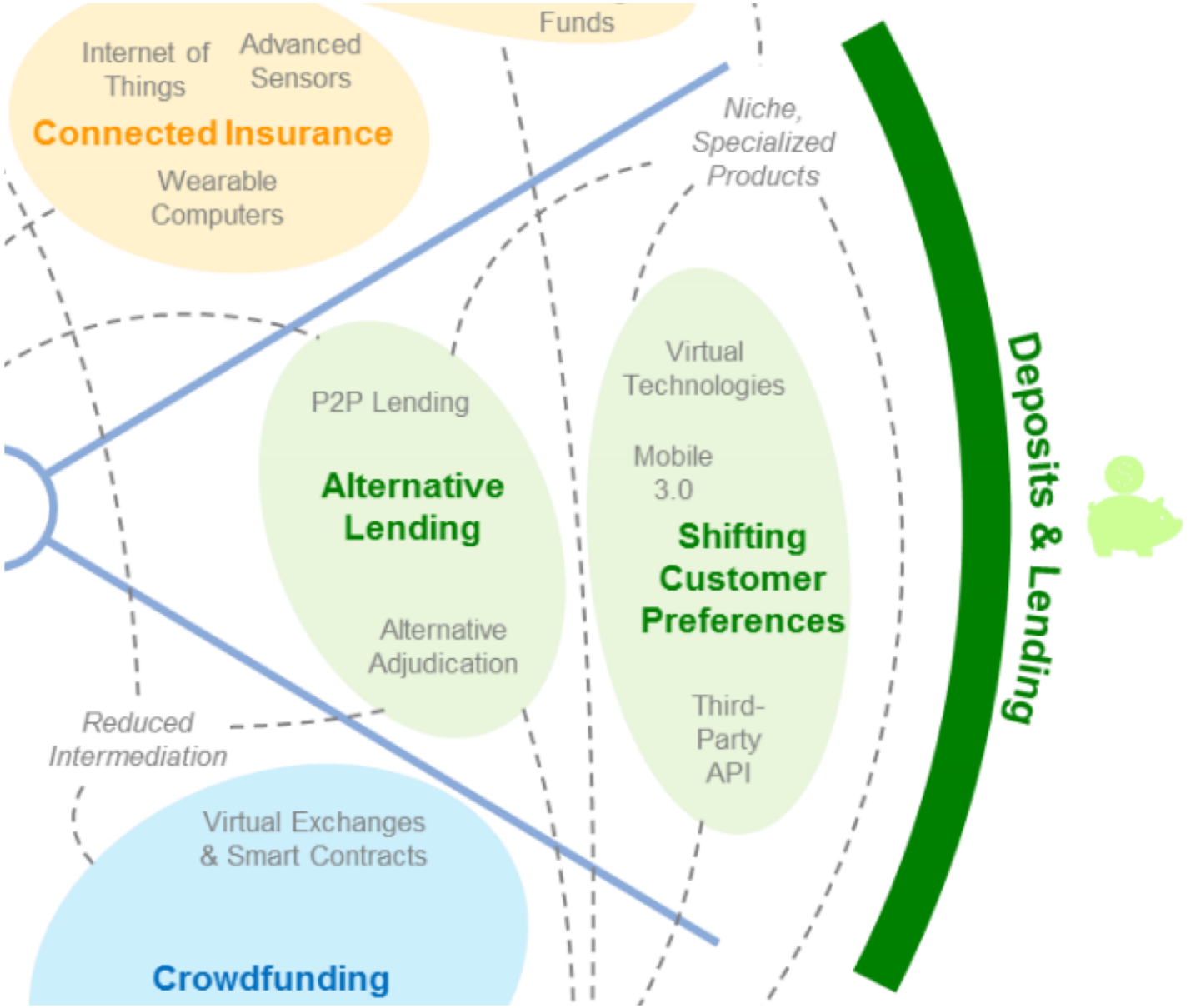
2

FinTech: Insurance
Insurance Disaggregation
Connected Insurance

圖表來源：Fugle團隊整理

Source: https://www.stockfeel.com.tw/2015年世界經濟論壇－未來的金融服務/

3 FinTech: Deposits & Lending



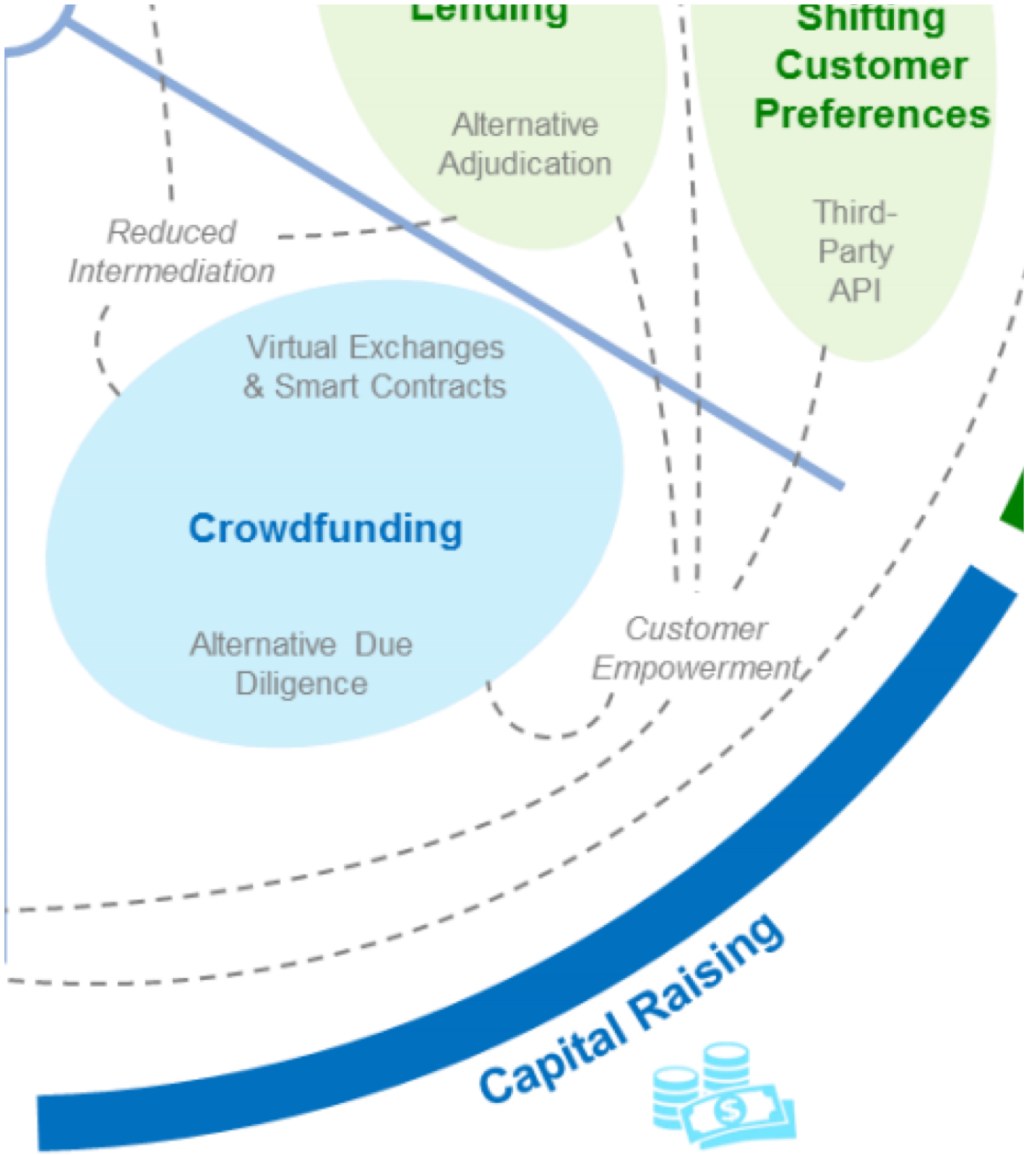
Source: http://www3.weforum.org/docs/WEF_The_future__of_financial_services.pdf

3 FinTech: Deposits & Lending
Alternative Lending
Shifting Customer Preferences

圖表來源：Fugle團隊整理

Source: https://www.stockfeel.com.tw/2015年世界經濟論壇－未來的金融服務/

4 FinTech: Capital Raising



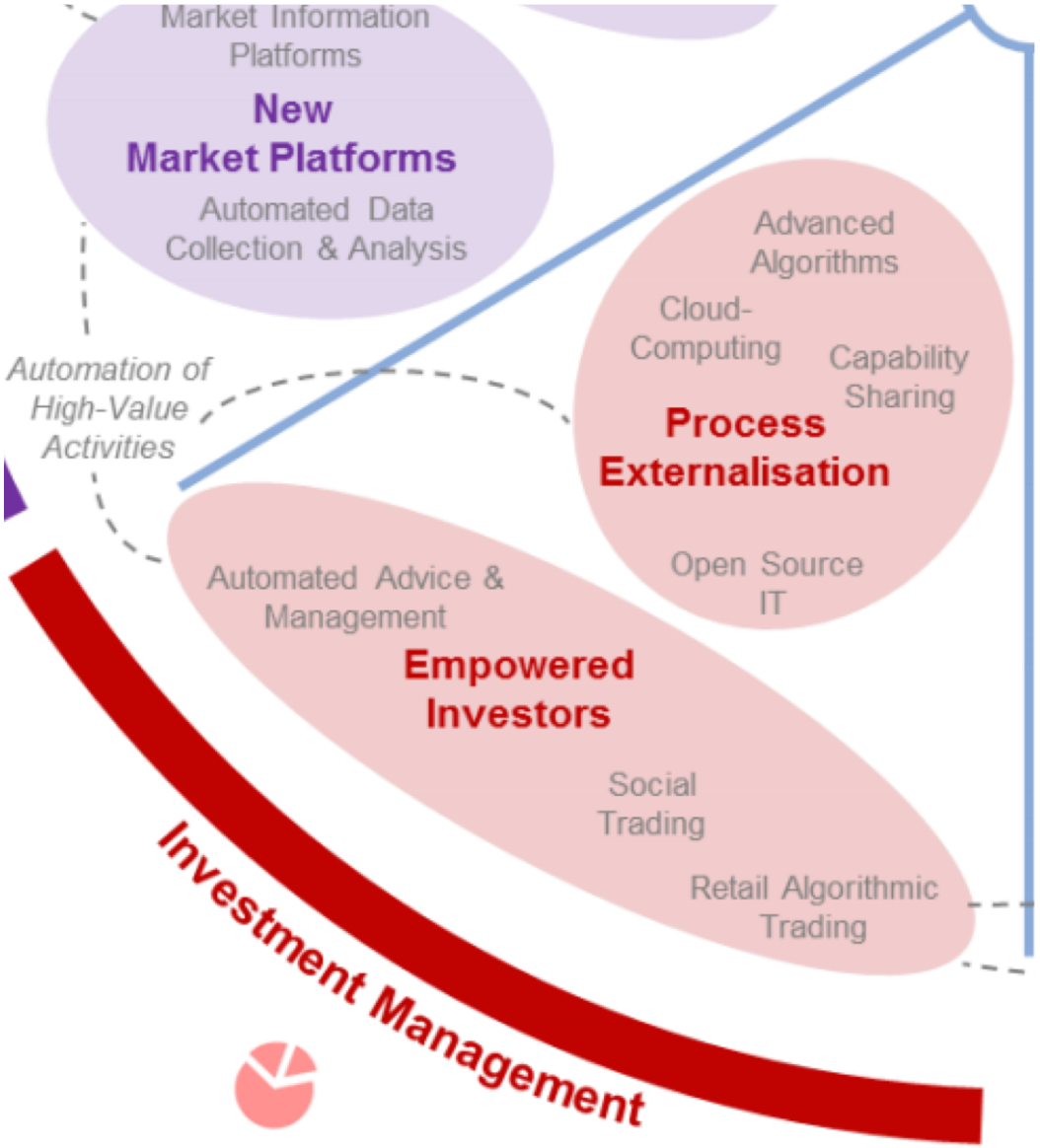
Source: http://www3.weforum.org/docs/WEF_The_future__of_financial_services.pdf

4 FinTech: Capital Raising Crowdfunding

圖表來源：Fugle團隊整理

Source: https://www.stockfeel.com.tw/2015年世界經濟論壇－未來的金融服務/

5 FinTech: Investment Management



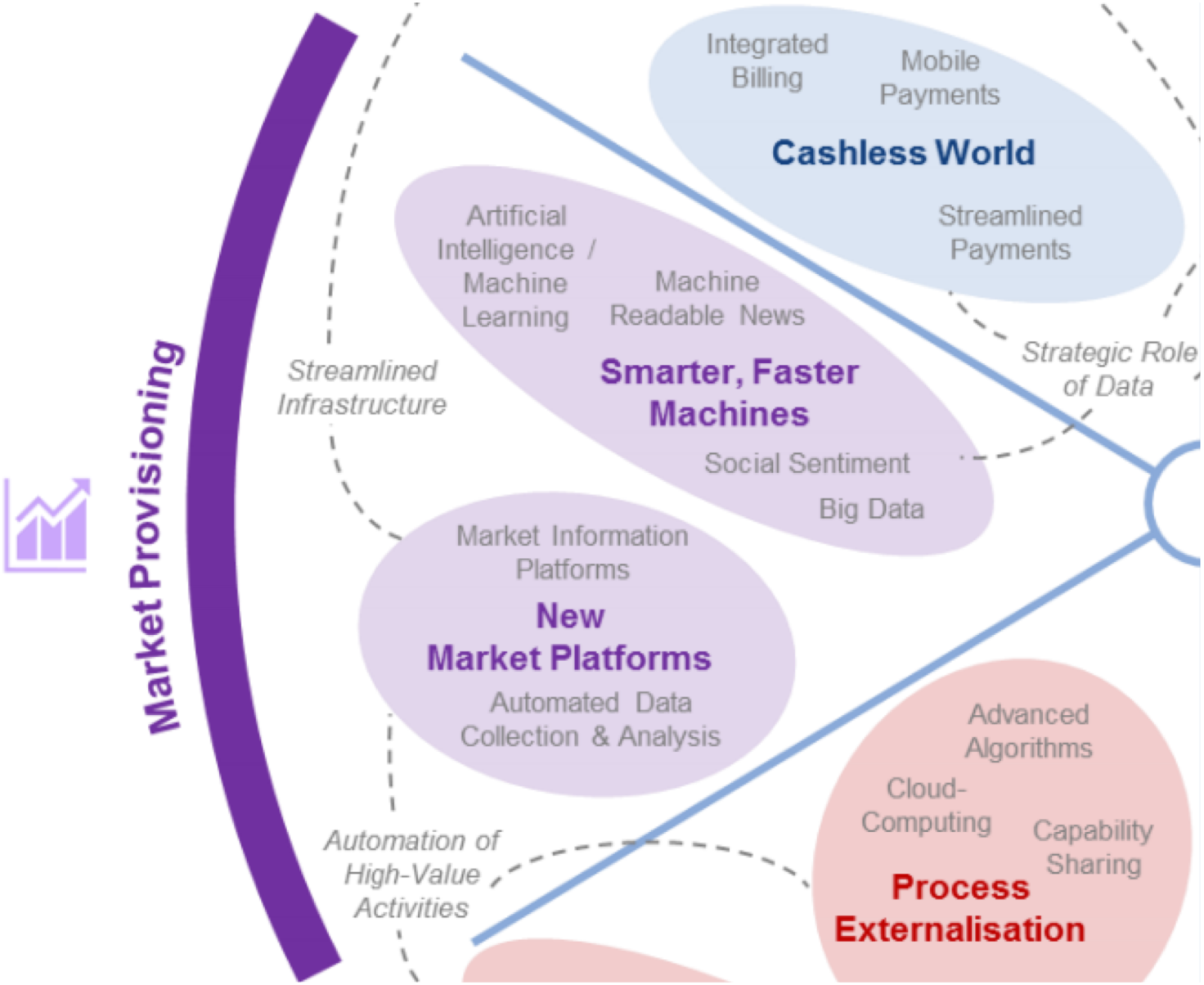
Source: http://www3.weforum.org/docs/WEF_The_future__of_financial_services.pdf

5 FinTech: Investment Management Empowered Investors Process Externalization

圖表來源：Fugle團隊整理

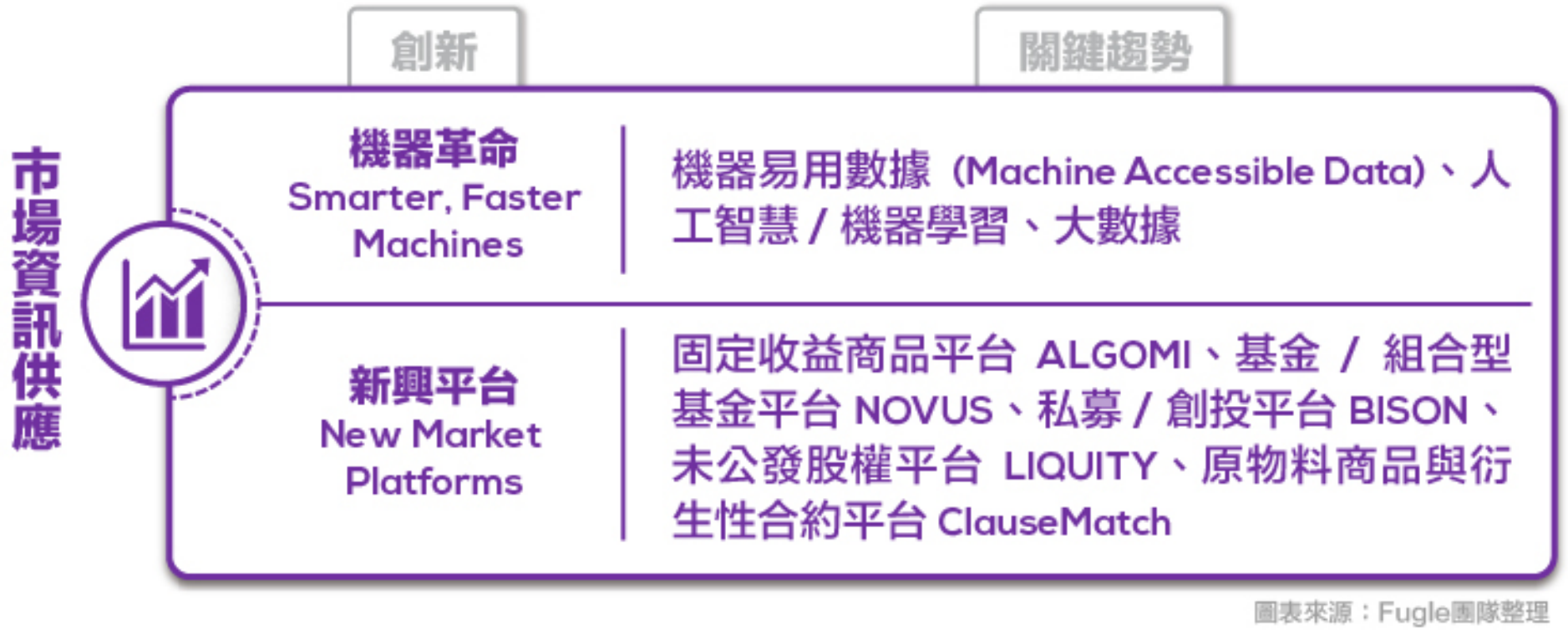
Source: https://www.stockfeel.com.tw/2015年世界經濟論壇－未來的金融服務/

6 FinTech: Market Provisioning



Source: http://www3.weforum.org/docs/WEF_The_future__of_financial_services.pdf

6 FinTech: Market Provisioning Smarter, Faster Machines New Market Platforms



圖表來源：Fugle團隊整理

Source: https://www.stockfeel.com.tw/2015年世界經濟論壇－未來的金融服務/

Artificial Intelligence and Deep Learning for Fintech

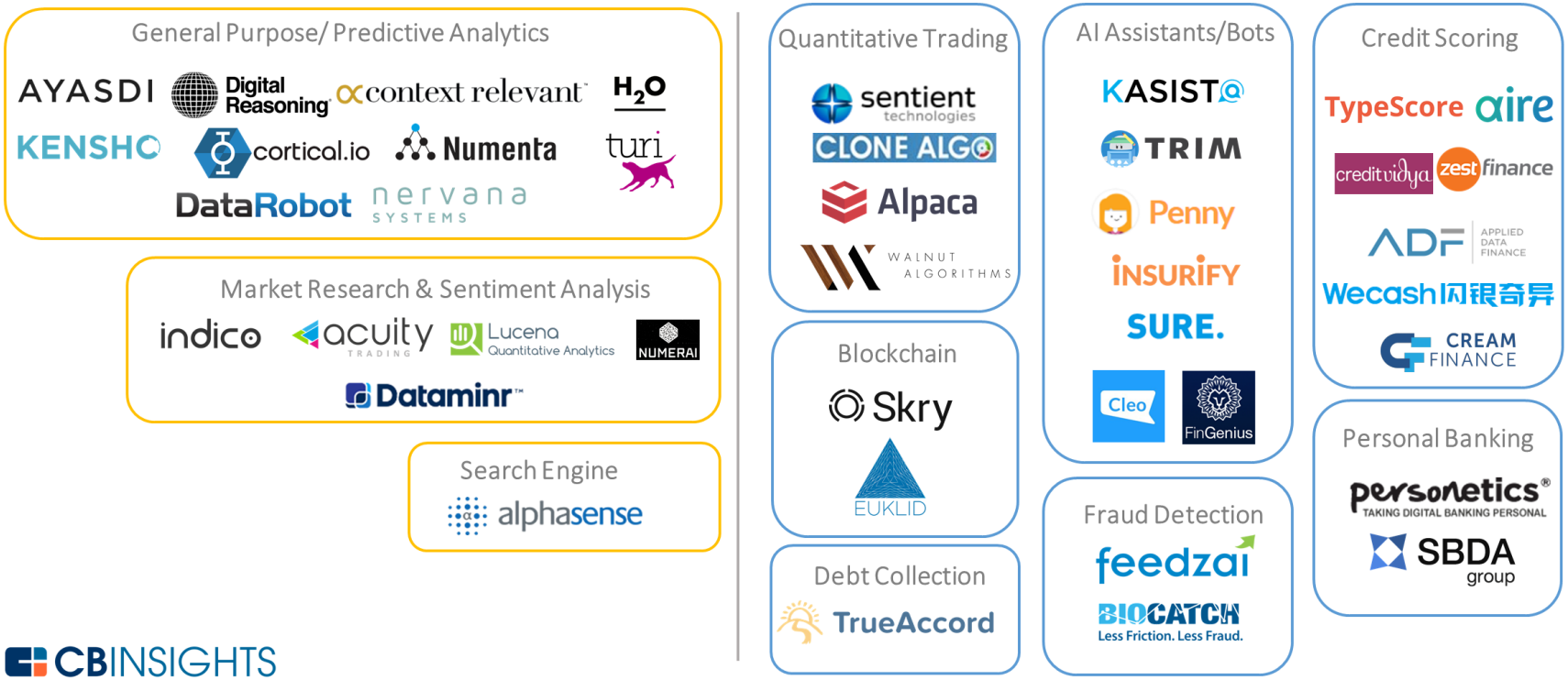
From Algorithmic Trading to Personal Finance Bots: 41 Startups Bringing AI to Fintech

Source: https://www.cbinsights.com/blog/artificial-intelligence-fintech-market-map-company-list/

From Algorithmic Trading To Personal Finance Bots: 41 Startups Bringing AI To Fintech

AI in Fintech

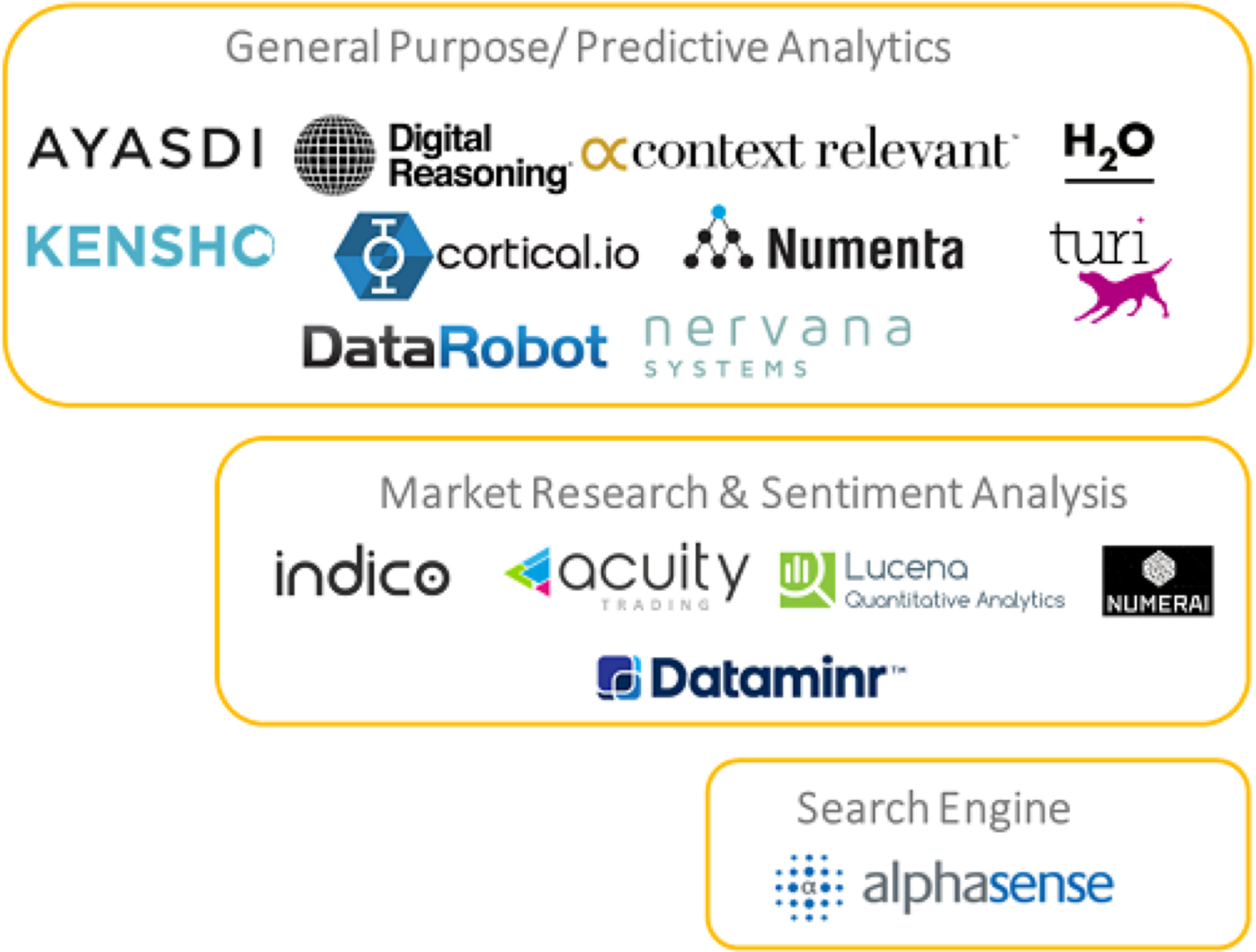
41 Startups Bringing Artificial Intelligence To Fintech



CBINSIGHTS
www.cbinsights.com

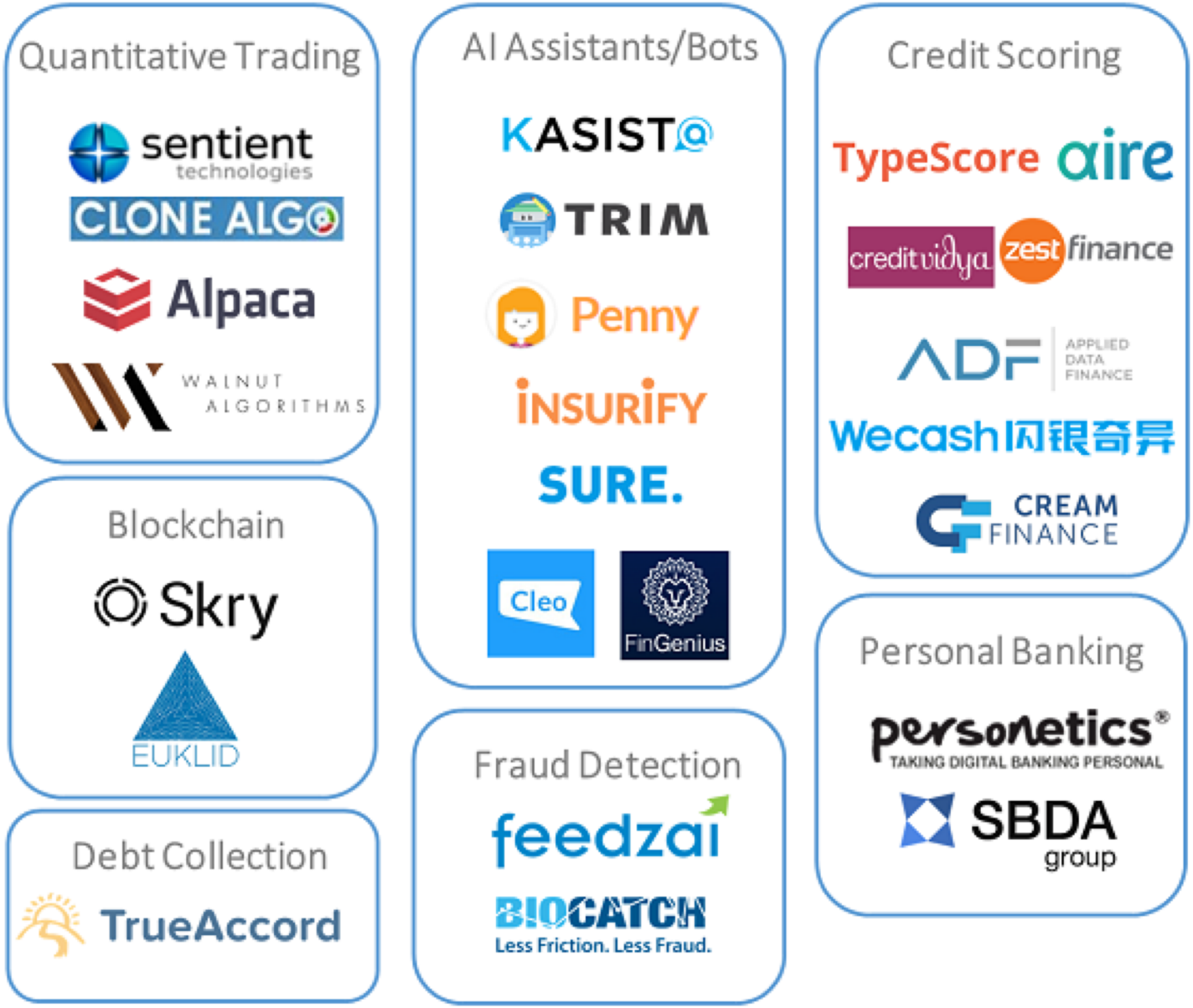
Source: https://www.cbinsights.com/blog/artificial-intelligence-fintech-market-map-company-list/

Artificial Intelligence (AI) in Fintech



Source: https://www.cbinsights.com/blog/artificial-intelligence-fintech-market-map-company-list/

Artificial Intelligence (AI) in Fintech



Source: https://www.cbinsights.com/blog/artificial-intelligence-fintech-market-map-company-list/

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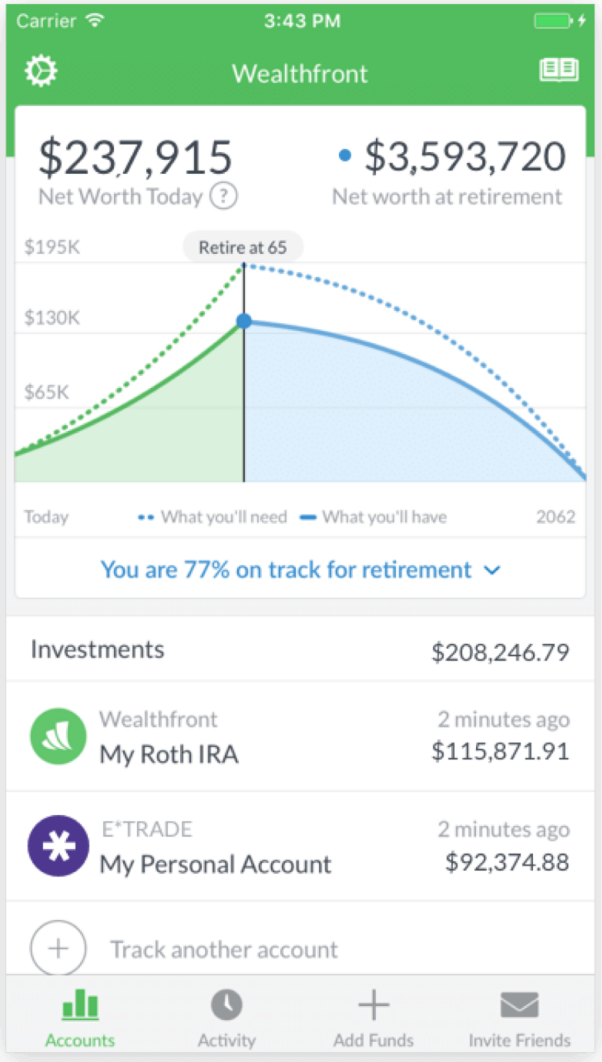
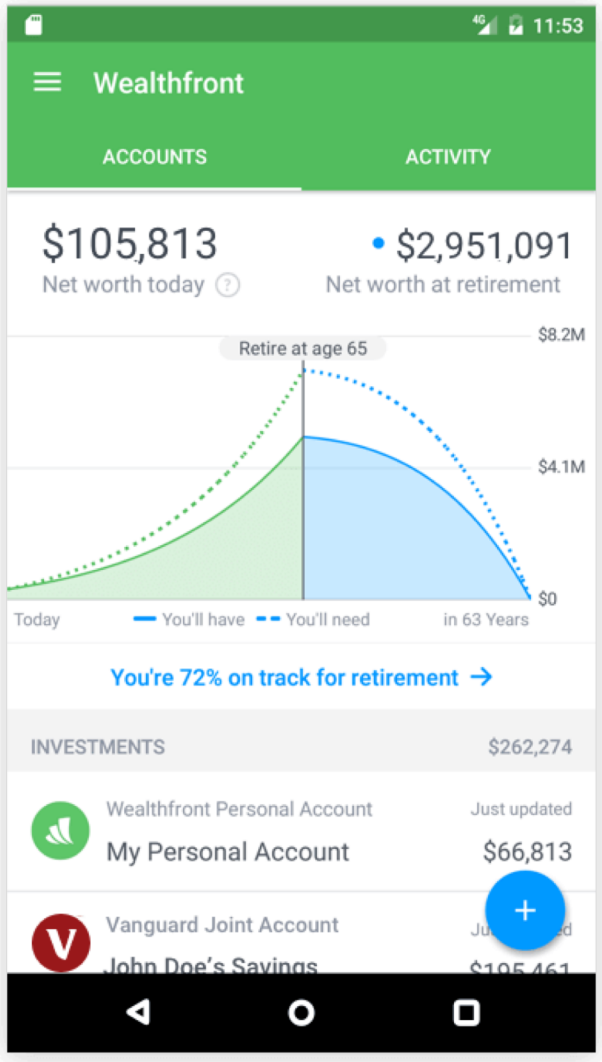
Wealthfront Robo Advisor





Source: https://www.wealthfront.com/

金融科技

Financial Technology, FinTech

財務金融大數據分析

Big Data Analytics in Finance

人工智慧投資分析

Artificial Intelligence for Investment Analysis

人工智慧與財務應用

Artificial Intelligence and Financial Application

投資大數據分析

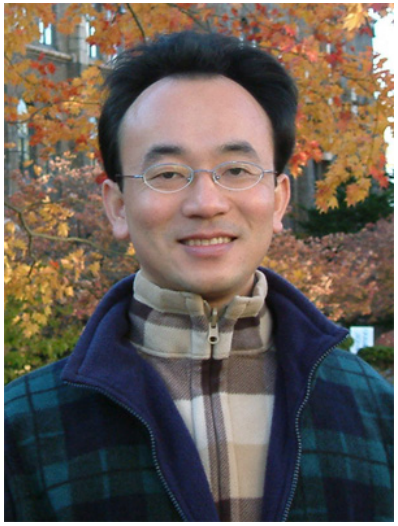
Big Data Analytics in Investment

Summary

- This course introduces the fundamental concepts and research issues of artificial intelligence for investment analysis.
- Topics include
  - AI in FinTech: Financial Services Innovation and Application
  - Robo-Advisors and AI Chatbots
  - Investing Psychology and Behavioral Finance
  - Event Studies in Finance
  - Foundations of AI Investment Analysis in Python
  - Quantitative Investing with Pandas in Python
  - Machine Learning with Scikit-Learn In Python
  - Deep Learning for Financial Time Series Forecasting with TensorFlow
  - Case Study on Artificial Intelligence for Investment Analysis

Contact Information

戴敏育 博士 (Min-Yuh Day, Ph.D.)



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