Autonomous Learning Investment Strategies (ALIS)

The Next Investment Process Paradigm: The Third Wave

MOV37
Autonomous Learning Investment Strategies (ALIS): Why now?

The confluence of five unprecedented developments has transformed into the new ALIS paradigm:

1. Enormous growth and multiple structures of data
2. New data science and structuring platforms to parse and classify data
3. Machine Learning – AI is finally working
4. Low cost on-demand and scalable computing leads to favorable investor fee dynamics
5. Playing too close to the information “Edge” is a risk
Four quadrants—the multiple structures of data

Structured

Financial

Non-Financial

Unstructured

Computational Finance  ALIS

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Exponential data growth—doubling at the rate of Moore’s Law

1 ZETTABYTE: more than four million times the size of the entire US Library of Congress²,³

Source: IDC Digital Universe Study, 2010

²McKenna, Brian “What does a petabyte look like?” ComputerWeekly.com. March 2013. According to Michael Chui, principal at McKinsey, the US Library of Congress “had collected 235 terabytes of data by April 2011 and a petabyte is more than four times that.”
³One zettabyte = one thousand exabytes = one million petabytes = one billion terabytes = one trillion gigabytes (1,000,000,000,000 gigabytes)
Number of data providers has exploded
How to interpret that data—new platforms

Data Science Platform
PLATFORM ORGANIZES DATA FOR ANALYSIS
"It may be 100 years before a computer beats humans at Go – maybe even longer”

DR PIER T HUT FOR PRINCETON’S INSTITUTE FOR ADVANCED STUDIES, 1997

Making decisions under conditions of uncertainty with incomplete information


Checkers Chess Go Poker

POKER

1 Andrew Ng, Former Head of Baidu AI Group/Google Brain; Metz, C. "Inside Libratus, the Poker AI That Out-Bluffed the Best Humans" Wired, February 1, 2017
2 Noam Brown, Creator of Libratus; Olivia, S. "Oh the humanity! Poker computer trounces humans in big step for AI" Guardian, January 30, 2017
3 Metz, C. "Inside Libratus, the Poker AI That Out-Bluffed the Best Humans" Wired, February 1, 2017

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This isn't a false dawn

Computer error rates on ImageNet Visual Recognition Challenge

Sources: The Economist, Google, ImageNet, Stanford Vision Lab
Man and Machine dominates Machine-only and Man-only

“Weak human + machine + better process was superior to a strong computer alone and, more remarkably, superior to a strong human + machine + inferior process.”

GARRY KASPAROV¹

% OF TOP 206 ALL-TIME HIGHEST RATED CHESS PERFORMANCES BY ‘CYBORGS’
(COMBINATIONS OF MAN AND MACHINE), MACHINES ONLY AND MAN ONLY

Data from Kenneth W. Regan; Ranking by raw error as of 2010 using chess program Rybka³;
http://www.cse.buffalo.edu/~regan/chess/fidelity/FreestyleStudy.html
Plummeting processing costs make ML methodologies achievable

MACHINES DON’T OWN HOUSES IN THE HAMPTONS!

EXPONENTIAL COST REDUCTION:
A million dollars of 1980 computing power costs less than 4 cents today

The Third Wave: The Darwinian Evolution of the “Repeatability Process”

<table>
<thead>
<tr>
<th>Information source</th>
<th>Unique analytical process</th>
<th>Good Judgment of Portfolio Manager</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Discretionary</strong></td>
<td>Structured financial data and “edge” through relationships within sectors, regions, and other informational sources, expert networks etc.</td>
<td>Top Tier MBAs &amp; Finance Professionals</td>
</tr>
<tr>
<td><strong>Quant</strong></td>
<td>Massive, finite quantities of expensive structured financial data</td>
<td>PhDs, algorithms and expensive processing power</td>
</tr>
<tr>
<td><strong>ALIS</strong></td>
<td>![ALIS Diagram]</td>
<td>![ALIS Diagram]</td>
</tr>
</tbody>
</table>

Source: Malcolm Gladwell. “Outliers”
Meanwhile, the information “edge” game has changed

2000
Regulation FD (Fair Disclosure) – Company information to everyone at the same time

2013
Investment Manager “to pay $1.8 billion, the largest insider trading fine ever”¹

2014
Investment analyst “gets nine years prison for insider trading”²

Investment players have three choices

- Back off the “Edge”
- Pay a Fine
- Go to Jail

¹ Sheelah Kolhatkar, “SAC Capital to pay $1.8 billion, the largest insider trading fine ever” Bloomberg News, November 4, 2013.
² Nate Raymond “SAC’s Martoma gets nine years prison for insider trading” Reuters, September 8, 2014. / Source: Vintage Monopoly Mr Pennybags Chance Card Vectors by robdevenney on DeviantArt.com
Legacy Firms

HANSOM CAB photographed in London in 1895.


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Where's the talent?

“I have one guy who has a PhD. in finance. We don’t hire people from business schools. We don’t hire people from Wall Street. We hire people who have done good science”

JIM SIMONS

INVESTORS

Existing Quant Managers

Industry Connections

Universities

DE Shaw & Co

Winton

IBM

Palantir

The Voleon Group

Man AHL

Intel

Google

UNIVERSITY OF CAMBRIDGE

UNIVERSITY OF OXFORD

Stanford University


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Traversed the Globe Searching for the Best ALIS

ALIS fund – Must be cohesive

Philosophy

Data ➔ Features ➔ Models ➔ Portfolio

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Time is not interchangeable
Simulation is very hard

Courtesy Google's DeepMind
Discovery of alpha changes the market
Known patterns are not alpha
But should be validation!
Low hanging fruit already heavily exploited

Designing a bespoke pair of sneakers... probably won't get you to the Olympics

Price/volume data heavily mined
Acronym Soup

Source: http://divinehealthfromtheinsideout.com/2016/01/not-campbells-homemade-gluten-free-alphabet-soup/
Back-test Heaven

Source: https://en.m.wikipedia.org/wiki/Overfitting
Why do you think there is “alpha”

1. Informational Edge
2. Behavioral Bias/Machine Bias
3. Analytical Edge
4. Market Microstructure
5. Regulatory Structure
Why do you think there is “alpha”

1

Informational Edge
Why do you think there is “alpha”

2

Behavioral Bias

Bias
Why do you think there is “alpha”

3
Analytical Edge
Why do you think there is “alpha”
Public Law 111–203  
111th Congress

An Act

To promote the financial stability of the United States by improving accountability and transparency in the financial system, to end "too big to fail", to protect the American taxpayer by ending bailouts, to protect consumers from abusive financial services practices, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE; TABLE OF CONTENTS.

(a) SHORT TITLE.—This Act may be cited as the “Dodd-Frank Wall Street Reform and Consumer Protection Act”.

(b) TABLE OF CONTENTS.—The table of contents for this Act is as follows:

Sec. 1. Short title; table of contents.
Sec. 2. Definitions.
Sec. 3. Severability.
Sec. 4. Effective date.
Sec. 5. Budgetary effects.
Sec. 6. Antitrust savings clause.

TITLE I—FINANCIAL STABILITY

Sec. 101. Short title.
Sec. 102. Definitions.

Subtitle A—Financial Stability Oversight Council
Sec. 111. Financial Stability Oversight Council established.
Sec. 112. Council authority.
Sec. 113. Authority to require supervision and regulation of certain nonbank financial companies.
Sec. 114. Registration of nonbank financial companies supervised by the Board of Governors.
Sec. 115. Enhanced supervision and prudential standards for nonbank financial companies supervised by the Board of Governors and certain bank holding companies.
Sec. 116. Reports.
Sec. 117. Treatment of certain companies that cease to be bank holding companies.
Sec. 118. Council funding.
Sec. 119. Resolution of supervisory jurisdictional disputes among member agencies.
Sec. 120. Additional standards applicable to activities or practices for financial stability purposes.
Sec. 121. Mitigation of risks to financial stability.
Sec. 122. GAO Audit of Council.
Sec. 123. Study of the effects of size and complexity of financial institutions on capital market efficiency and economic growth.

Subtitle B—Office of Financial Research
Sec. 151. Definitions.
Sec. 153. Purpose and duties of the Office.
Sec. 154. Organizational structure; responsibilities of primary programmatic units.
Sec. 155. Funding.
Sec. 156. Transition oversight.
网络游戏将实施总量调控 腾讯网易美股隔夜重挫逾7%

作者：曾心怡  2018-08-30 19:16

摘要：

国家新闻出版署将对网络游戏实施总量调控，控制新增网络游戏上网运营数量，探索符合国情的适龄提示制度，采取措施限制未成年人使用时间，腾讯美股本跌近7%，创近两周新低；网易美股跌逾7%，创2016年6月以来最低。

原文首发于8月30日21:22，现更新腾讯美股和网易收盘价。

为预防未成年人近视，监管层对行业监管再度趋严。

8月30日周四晚间，教育部等八部门关于印发《综合防控儿童青少年近视实施方案》的通知显示，国家新闻出版署将对网络游戏实施总量调控，控制新增网络游戏上网运营数量，探索符合国情的适龄提示制度，采取措施限制未成年人使用时间。
 STOCK FALLS 6% IN 2.5 HOURS OF TRADING

Regulatory filing by Johannesburg-based Naspers Ltd. shows
Chief Financial Officer and Executive Director, CFO, Peter Naudé, was named as departing CEO
$1.8 billion, the largest single

DATA POINT: Article is published at 9:22

Source: Bloomberg

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How to analyze that data – understanding bots and noise

Important that teams have the expertise to understand the nature of the data
<table>
<thead>
<tr>
<th>Method</th>
<th>Learning Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bag of words (with Naïve Bayes)</td>
<td>Supervised</td>
<td>Assumes positive and negative words with no sentence context (any order). Simple and fast.</td>
</tr>
<tr>
<td>Word2Vec (with FastText)</td>
<td>Supervised</td>
<td>Builds on the above and adds n-grams (sequence of words). Fast and captures some sentence context</td>
</tr>
<tr>
<td>Recursive Neural Tensor Network</td>
<td>Deep</td>
<td>Tree structure NN to determine word groups that are positive and negative. Good performance; slow to train/test</td>
</tr>
</tbody>
</table>
What are the 3 opportunities in ALIS?

I. Building and incubating a new Vertical – in investment management

What are the 3 opportunities in ALIS?
II. Providing seed capital

Source: https://www.theguardian.com/science/2006/may/26/uknews
What are the 3 opportunities in ALIS?

III. Incubating the next generation

Source: https://www.pandasinternational.org/our-causes/donate-for-incubators/
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