



Danny Saksenberg
Co-founder and Chief AI Officer of Emerge



EMERGE

Nedbank Investment Conference

Danny Saksenberg

AI and its relevance – past, present and future

Past

“AI has been part of our imaginations and simmering in research labs since a handful of computer scientists rallied around the term at the Dartmouth Conferences in 1956 and birthed the field of AI...Over the past few years AI has exploded, and especially since 2015. Much of that has to do with the wide availability of GPUs that make parallel processing ever faster, cheaper, and more powerful.”

Nvidia’s website



Present

“ChatGPT is incredibly limited, but good enough at some things to create a misleading impression of greatness. It’s a mistake to be relying on it for anything important right now. it’s a preview of progress; we have lots of work to do on robustness and truthfulness.”

Sam Altman, CEO OpenAI. Twitter 12/10/22.



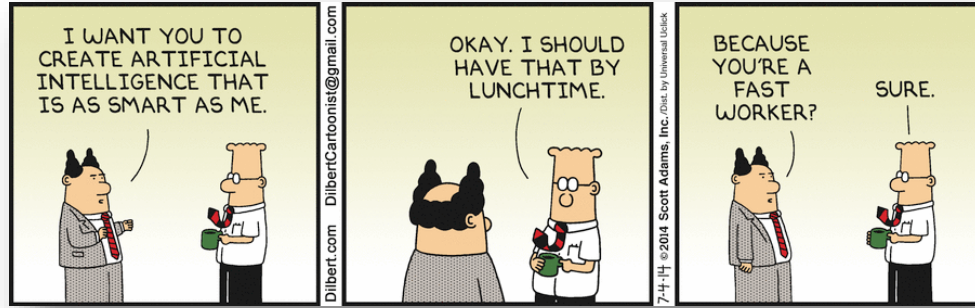
Future

“There will be two kinds of companies at the end of this decade... Those that are fully utilizing AI, and those that are out of business.”

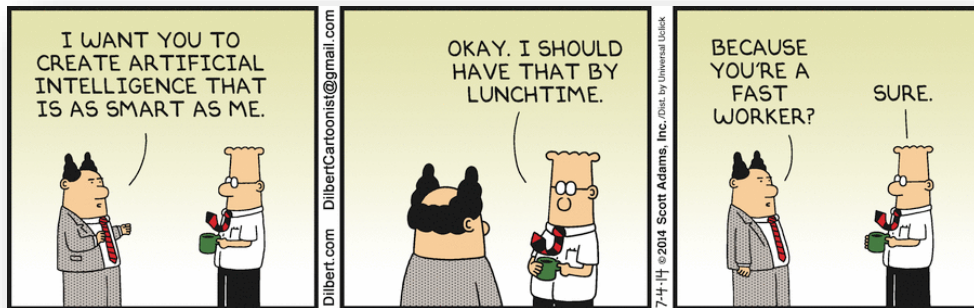
Peter H Diamandis



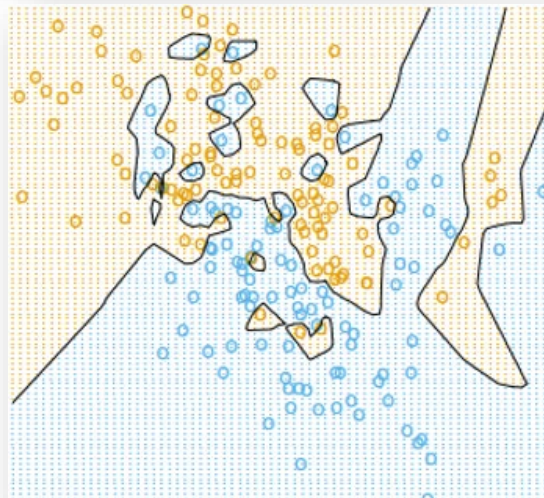
What is AI?



What is AI?



AI is about finding
patterns in data
(often a lot more
accurately than human
beings 😊)



What value does AI offer?

Let's discuss a few case studies

LLMs and agents

Banking

IFRS

Medical

Engineering

Investment management

ChatGPT, large language models and agents

ChatGPT 3.5

How would you use AI in banking?

AI can revolutionize banking in numerous ways, from enhancing customer experiences to optimizing internal processes. Here are some examples:

- 1. Fraud Detection:** AI algorithms can analyze vast amounts of transaction data in real-time to detect suspicious activities and patterns, helping to prevent fraud before it occurs.
- 2. Customer Service:** AI-powered chatbots can provide 24/7 customer support, handling routine inquiries, account management, and even assisting with basic financial advice.
- 3. Personalized Recommendations:** By analyzing customer data, AI can provide personalized product recommendations, such as tailored loan offers, investment opportunities, or savings plans.
- 4. Credit Scoring:** AI algorithms can assess creditworthiness more accurately by analyzing a wider range of data points, including social media activity, online behavior, and transaction history, enabling banks to offer loans to individuals who may not have traditional credit histories.
- 5. Risk Management:** AI models can analyze market trends, economic indicators, and other external factors to assess risk more effectively, helping banks make better-informed decisions about lending, investment, and asset management.
- 6. Algorithmic Trading:** AI algorithms can analyze market data and execute trades autonomously, leveraging machine learning techniques to identify profitable opportunities and minimize risks.

Message ChatGPT

P What are the national research ethics guidelines on retaining data?

R The National Statement on Ethical Conduct in Human Research outlines several guidelines related to retaining and managing data. According to Section 3, Element 7, researchers have ongoing ethical responsibilities after a project is completed, which include proper disposal or retention of data and information. They must adhere to the principle of respect for persons by addressing potential risks associated with data collection, use, and management in their research plan and consent processes. Researchers should also consider privacy guidelines that may apply to the specific study. Additionally, they need to ensure that sharing any research data during or after a project does not create additional risks of re-identification of information or data. These aspects should be clearly addressed in the research plan and consent documentation.

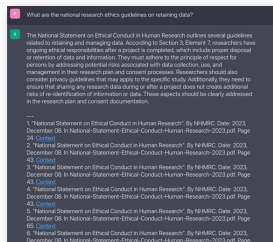
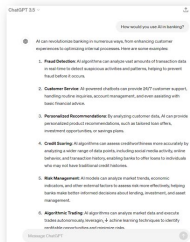
1. "National Statement on Ethical Conduct in Human Research". By NHMRC. Date: 2023, December 08. In National-Statement-Ethical-Conduct-Human-Research-2023.pdf. Page 24. [Context](#)
2. "National Statement on Ethical Conduct in Human Research". By NHMRC. Date: 2023, December 08. In National-Statement-Ethical-Conduct-Human-Research-2023.pdf. Page 43. [Context](#)
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5. "National Statement on Ethical Conduct in Human Research". By NHMRC. Date: 2023, December 08. In National-Statement-Ethical-Conduct-Human-Research-2023.pdf. Page 65. [Context](#)
6. "National Statement on Ethical Conduct in Human Research". By NHMRC. Date: 2023, December 08. In National-Statement-Ethical-Conduct-Human-Research-2023.pdf. Page

What value does AI offer?

Let's discuss a few case studies

LLMs and agents

ChatGPT and large language models



Banking

IFRS

Medical


Engineering


Investment management

Banking case studies

 <p>Cross-sell</p>	<p>250%</p> <p>Increase in sales conversion rate for an insurance campaign to existing clients</p>
------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------

 <p>Retention</p>	<p>50%</p> <p>Reduction in cancellations with very simple email interventions</p>
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 <p>Credit</p>	<p>42%</p> <p>Improvement in credit defaults by implementing an AI-based credit application scorecard</p>
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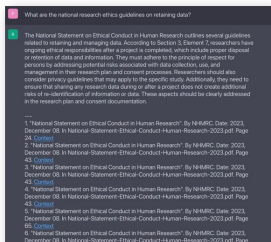
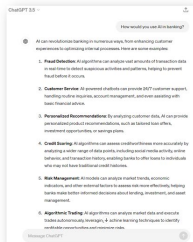
 <p>Fraud</p>	<p>20</p> <p>Fraud investigators no longer needed to be hired because fraud was more accurately found</p>
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Let's discuss a few case studies

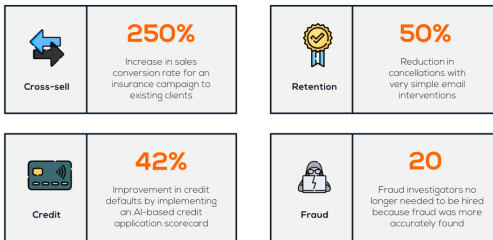
LLMs and agents

ChatGPT and large language models



Banking

Operational case studies



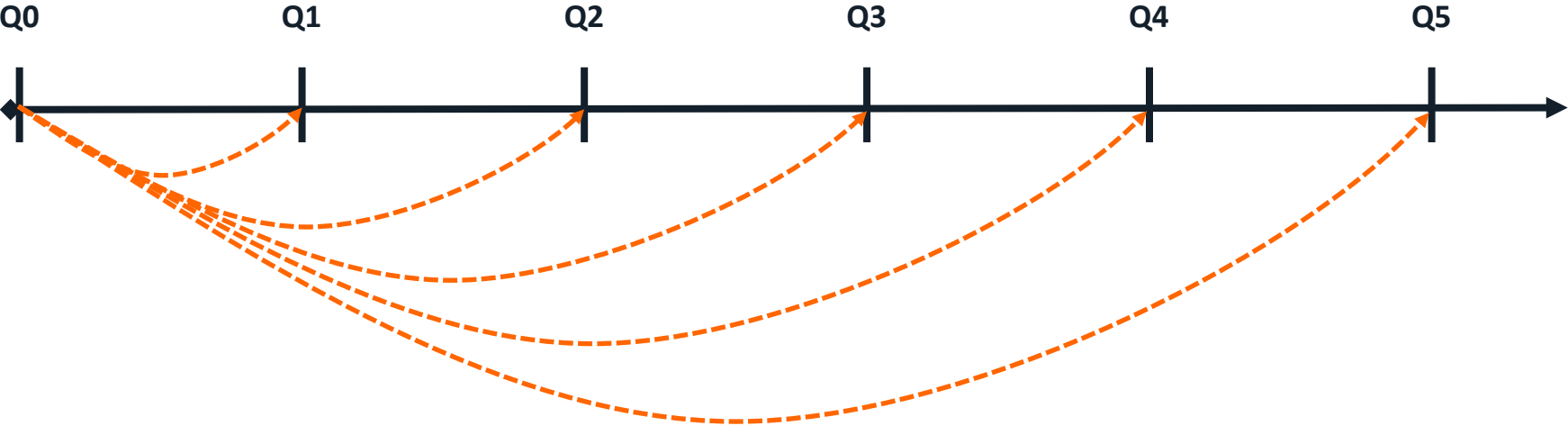
IFRS

Medical

Engineering

Investment management

IFRS9 case study



Data input	Accuracy	Usage
Credit bureau data	Ginis of greater than 85%	SICR: PD goes up Curing: PD is equal to or goes down

What value does AI offer?

Let's discuss a few case studies

LLMs and agents

ChatGPT and large language models

What are the national research ethics guidelines on retaining data?

- 1. Data Retention:** An algorithm can analyze user preferences to recommend data. It must ensure that sensitive information is not stored longer than necessary and is securely deleted or anonymized.
- 2. Data Access:** AI-powered assistants must ensure that user data is not shared with third parties without explicit consent. Access to user data should be limited to authorized personnel.
- 3. Personalized Recommendations:** By analyzing customer data, AI can provide personalized product recommendations, such as tailored loan offers, investment opportunities, or insurance plans.
- 4. Credit Scoring:** Algorithms can assess creditworthiness more accurately by analyzing a wider range of data points, including social media activity, online behavior, and text-based history, leading to better loan offers based on individual risk profiles and financial health.
- 5. Risk Management:** AI models can analyze market trends, economic indicators, and other information to assess risks and provide timely alerts, helping users make informed decisions and manage their investments, insurance, and other financial goals.
- 6. Algorithmic Trading:** Algorithms can analyze market data and execute trades automatically, providing a faster and more efficient way to trade securities.

Medical

Banking

Operational case studies

	250% Increase in sales conversion rate for an insurance campaign to existing clients		50% Reduction in cancellations with very simple email interventions
	42% Improvement in credit application scorecard by implementing an AI-based credit		20% Fraud investigators no longer needed to be hired because fraud was more accurately found

Engineering

IFRS

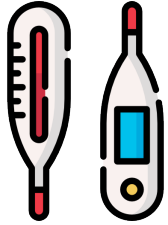
IFRS9 case study

Q0	Q1	Q2	Q3	Q4	Q5
Data input					
Credit Bureau data					
	Accuracy				
	Ginis of greater than 85%				
		Usage			
		SICR: PD goes up			
		Curing: PD is equal to or goes down			

Investment management

What are potential applications?

Screening



Predict which individuals are at **risk of contracting** a disease

Diagnosis



Identify which potential patients **have a disease** and which don't

Treatment



Select the best **treatment plan** for a patient (precision medicine)

Prognosis



Determine which patients are likely to have what **disease prognosis**

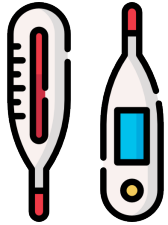
Compliance



Pre-empt which patients will get **drug side effects** and treat them

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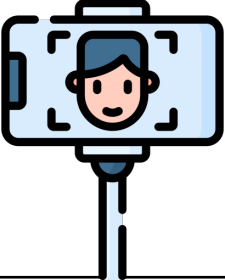


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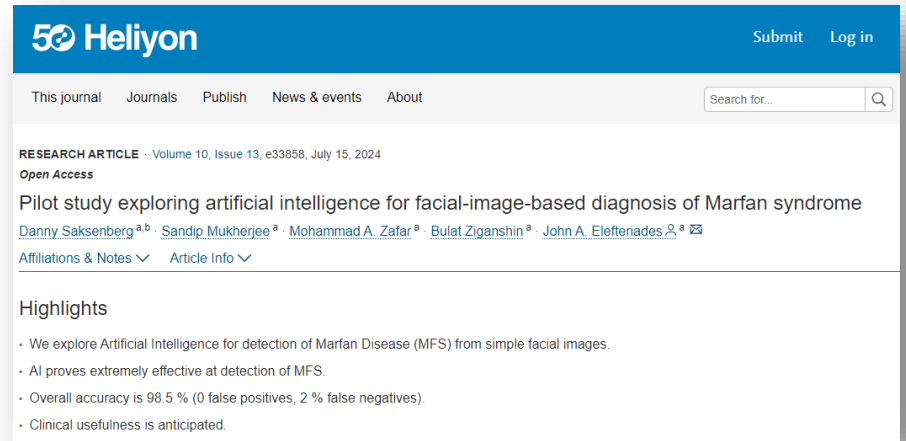
Marfan syndrome

Use a selfie to diagnose a genetic syndrome

- Working with Yale University on a project to predict **aortic aneurysms**, we led to an exploration of Marfan Syndrome because about **90% of people with Marfan syndrome develop changes** in their heart and blood vessels (Source: Cleveland Clinic)
- There is preliminary research to suggest that the **facial features of people with Marfan syndrome** hold clues that could help determine who has the syndrome so Emerge built an AI tool to screen for the condition using a selfie to **98.5% accuracy**. The team that worked on this project recently published an academic paper on our findings.



		Predicted	
		Marfan	Non-Marfan
Actual	Marfan	32	2
	Non-Marfan	0	100



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Open Access

Pilot study exploring artificial intelligence for facial-image-based diagnosis of Marfan syndrome

[Danny Saksenberg](#)^{a,b} · [Sandip Mukherjee](#)^a · [Mohammad A. Zafar](#)^a · [Bulat Ziganshin](#)^a · [John A. Eleftheriades](#)^a ✉

[Affiliations & Notes](#) [Article Info](#)

Highlights

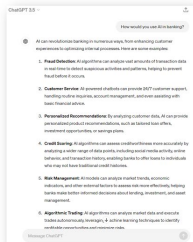
- We explore Artificial Intelligence for detection of Marfan Disease (MFS) from simple facial images.
- AI proves extremely effective at detection of MFS.
- Overall accuracy is 98.5 % (0 false positives, 2 % false negatives).
- Clinical usefulness is anticipated.

What value does AI offer?

Let's discuss a few case studies

LLMs and agents

ChatGPT and large language models



1. The National Statement on Ethical Conduct in Human Research outlines general guidelines relating to learning and managing data. According to Section 3, Element 7, researchers have ongoing ethical responsibilities after consent is given, which include proper storage and deletion of data and information. They must adhere to the principle of respect for persons by addressing consent of data associated with data collection, use, and management of the research and consent processes. Researchers must also consider privacy guidelines that may apply to the specific study. Additionally, they need to ensure that sharing any research data through a system does not create additional risks of de-identification of information or data. These aspects should be clearly addressed throughout your data consent documentation.

2. "National Statement on Ethical Conduct in Human Research" By NHMRC. Date: 2003, December 08. In National Statement on Ethical Conduct in Human Research-2003.pdf Page 43, Col 10.

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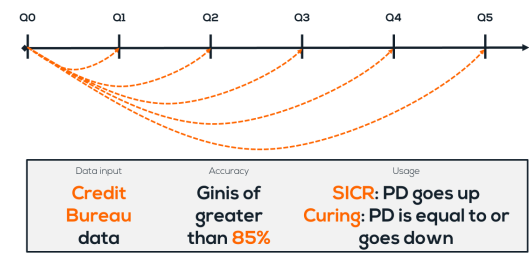
Banking

Operational case studies

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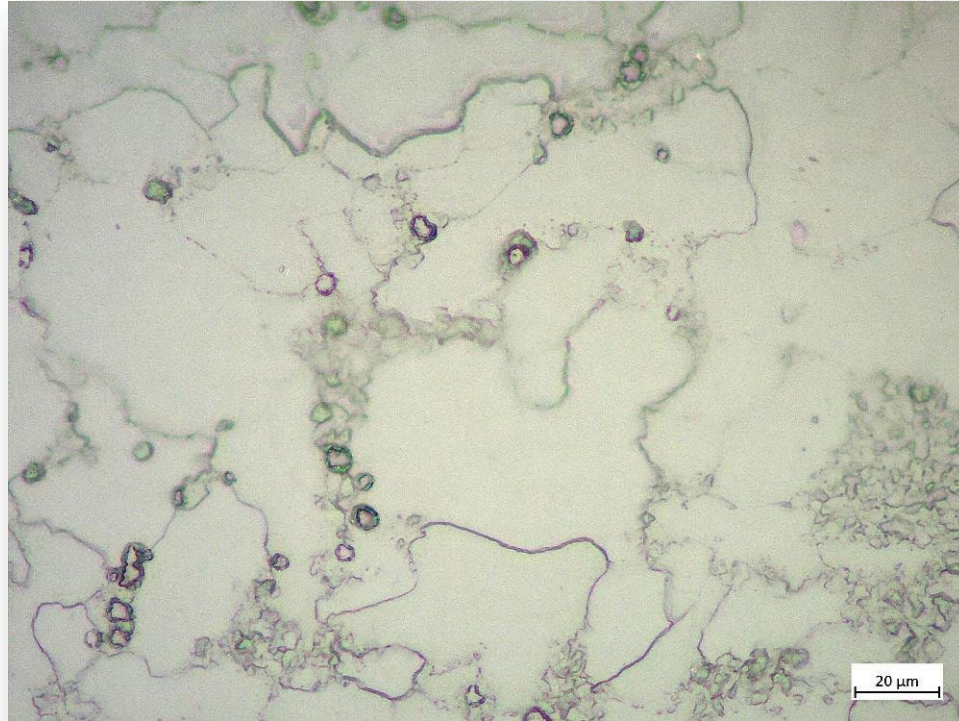
Engineering case study

Recognition of level of pipe fatigue in steam pipe at coal-fired power plant

A **silicate replica of the pipe surface was taken** and reviewed under a microscope by a skilled metallurgical engineer.

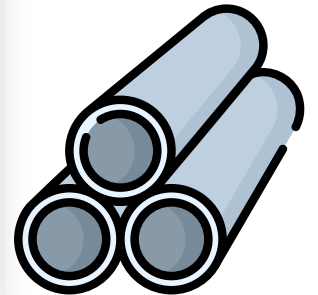
Based on the review, the **expected lifetime of the length of pipe is estimated**. Depending on the volume of images to review, turnaround time can take several days or weeks.

A range of labelled replica images were used to train an **image-recognition model aimed at emulating the decisions of the panel of metallurgists**.



95%

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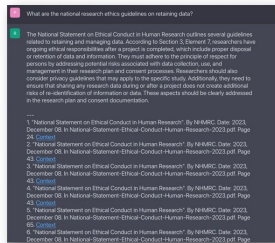
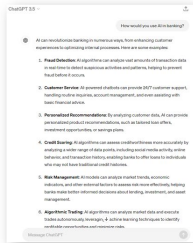


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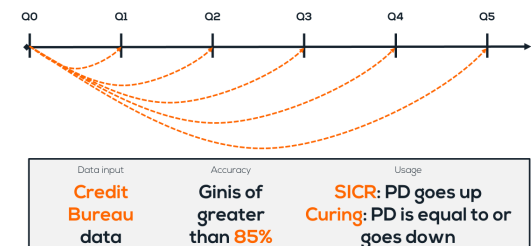
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Operational case studies



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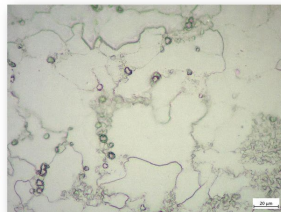
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Investment management

Investment case study

Real money track record investing in US large-cap equities using Emerge's technology (from July 2019 to May 2024)

Conservative mandate

Large-cap stocks

Highly liquid and scalable

Shares with 10 years of history

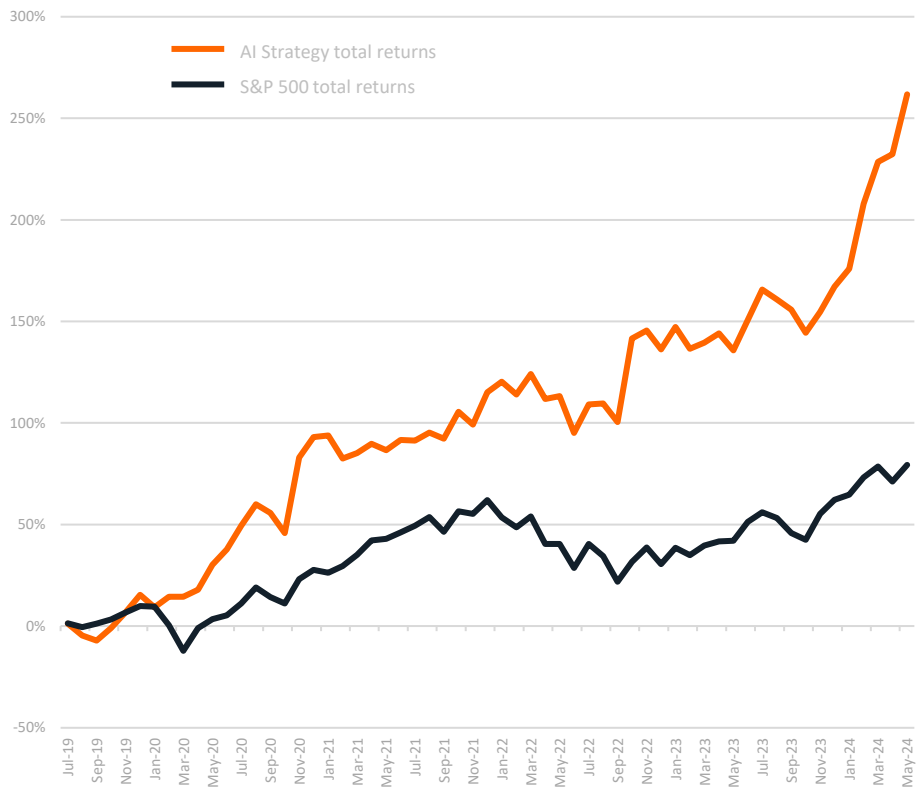
Spread of industries

No leverage

No arbitrage

No shorting

No high-frequency trading



S&P absolute return **79%**

AI strategy absolute return **262%**

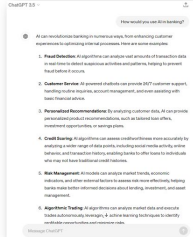
Risk Metrics (updated up to Q1 2024)	S&P 500	AI Strategy
Max Drawdown	24.77%	10.52%
Peak-to-Valley	12/21 - 09/22	03/22 - 09/22
Recovery	15 Months	1 Month
Sharpe Ratio	0.44	1.00
Sortino Ratio	0.65	2.16
Standard Deviation	5.20%	6.25%
Downside Deviation	3.56%	2.91%
Mean Return	1.10%	2.24%

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LLMs and agents

ChatGPT and large language models



What are the national research ethics guidelines on returning data?

The National Statement on Ethical Conduct in Human Research outlines several guidelines relating to learning and managing data. According to Section 3, Element 7, researchers have an obligation to ensure that any data generated, which is likely to be sensitive, is returned to the participant in a timely and appropriate manner. They must obtain the participant's informed consent for addressing consent issues associated with data collection, use, and management. If the research involves secondary purposes, researchers must also consider privacy guidelines that may apply to the specific study. Additionally, they need to ensure that sharing any research data through the system does not reveal additional uses of the distribution of information or data. These aspects should be clearly addressed in the research plan and consent documentation.

1. "National Statement on Ethical Conduct in Human Research" By NHMRC Date: 2003, December 08. In National Statement on Ethical Conduct in Human Research-2003.pdf Page 43, C146.

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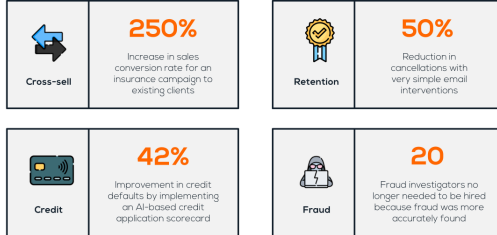
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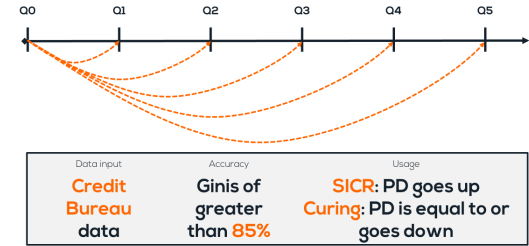
Banking

Operational case studies



IFRS

IFRS9 case study

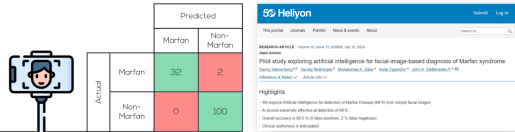


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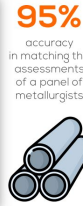
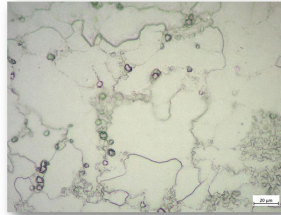
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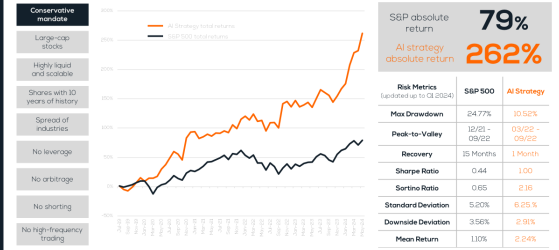
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What are the benefits and potential risks?

Benefits

- Increased **revenue**
- Reduced **expenses**
- Better **compliance**
- Increased **efficiency and scalability**
- Improved **customer experience**
- Creating a **competitive advantage**

Risks

- **Privacy** issues
- Skills **scarcity**
- Job **losses**
- Model **bias** and fairness
- Lack of **explainability**
- **Ethical** challenges and market risks

EMERGE

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