LET'S **TALK** DIGITAL

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Let's Talk Digital is a monthly newsletter that was created to build awareness on Digital Banking and provide a platform for industry practitioners to share insight and current trends on this exciting subject matter in relation to the Banking and Finance industry.

How Do Machines Learn

By Ian Goh Suan Hooi

Interest in machine learning grew from research into methods of creating Artificial Intelligence. One of the most popular approaches towards machine learning currently is the use of "neural networks". While the field of research itself is not new, the advent of faster processing capabilities has made machine learning commercially viable, from simple tasks like cataloguing pictures of animals, all the way to detecting insurance fraud.

Ethics in AI

By Peter Kua Seng Choy

Although artificial intelligence is reshaping how financial institutions operate, it comes with substantial risks. There are various methods to deceive AI, and one of them is through data that is biased. Banks need to think about the instructions and data fed to AI systems and establish strict guidelines to maintain its ethical usage.

To find out more about the Digital Banking programmes that ABS offers, visit

www.asianbankingschool.com/our-programmes/centre-for-digital-banking

Ian Goh Suan Hooi

With more than two decades in the industry, Ian's career spans multiple industries including Financial, Logistics, and Telecommunications both as a vendor and end user. He has held roles in multiple parts of the IT delivery value chain including operations, project and program management, systems integration and more recently IT strategy and architecture. He has experience in various domains including CRM, Business Intelligence and SOA.

Ian's current interest is in the impact of the digital economy on an organization. Given the need for agility within IT and the availability of Infrastructure, Platform and Software as near commodity services through cloud service providers, the lines between IT and business are blurring. Thus, requiring individuals to have a broader understanding of organizational dynamics and the need to embrace new approaches to service management such as bimodal IT, DevOps and Lean. Ian is passionate about helping IT professionals in redefining their role within this context.

Ian holds a master degree in electronics engineering and a bachelor degree in Information and Electronics Engineering from Curtin University, Western Australia. He also holds professional certifications from ITIL, TMForum, IASA and the Open Group.

Peter Kua Seng Choy

Peter Kua is currently Head of Data Science and Analytics in Media Prima Digital. His responsibilities include finding ways data can be used as a competitive advantage as well as identifying new business opportunities with data.

Peter was also instrumental in driving the National Big Data Analytics (BDA) Initiative under the Malaysia Digital Economy Corporation (MDEC) in the areas of thought leadership and industry development. He played a key role in developing the first National BDA Framework that delivered strategic recommendations / action plans to achieve the National BDA vision.

Peter has extensive tech-related experience in various roles: Big Data / Data Science Strategy, Technopreneur, CTO, Project Manager and Software Developer. Startup leadership & management style. Excellent communication skills. Solid network of contacts in the private sector, government and universities/colleges.

How Do Machines Learn?

By Ian Goh Suan Hooi

Differences between traditional programming techniques and machine learning.

Traditionally, if we wanted a computer to do something, a person, normally referred to as a Programmer would develop something called a Program. A Program is essentially a step by step series of instructions which you want the computer to execute. The computer would then take these set of instructions and execute each of these instructions in the sequence you told it to. Thus, leading to the famous adage that "computers do what you tell it to do, not what you want it to do."

In most used cases, this is exactly what is required; you need the computer to calculate the tax on a set of invoices, or to print a report in a predefined format. You want to be able to explicitly define how tax is calculated or how wide the margins on your printed report should be. But what if you had a large collection of pictures of animals and you wanted the computer to identify what animals they were? You could, in theory, use the same approach as the report example, but you would have to define what a cat or dog looks like.

What if computers could learn the way humans do, i.e. through exposure to stimulus? So, if I wanted to teach a child what a dog was, I would show her a dog and tell her this is a dog. She would probably get it wrong the first few times, probably by saying "dog" when she sees any animal that has 4 legs. Through feedback and more examples, she will be able to make better and better distinctions.

Eventually, she will also be able to notice traits that define the different dog breeds; the elongated body of the Daschund, or the long floppy ears of the Beagle.

In short, humans learn by exposure to stimulus (i.e. seeing pictures of animals) and feedback (i.e. being told which one is a dog and which isn't). This is essentially how machine learning works.

Artificial Neural networks

The science behind machine learning is the Artificial Neural Network (ANN). Neural networks are (loosely) modelled after the neurons in the human brain. (Figure 1)

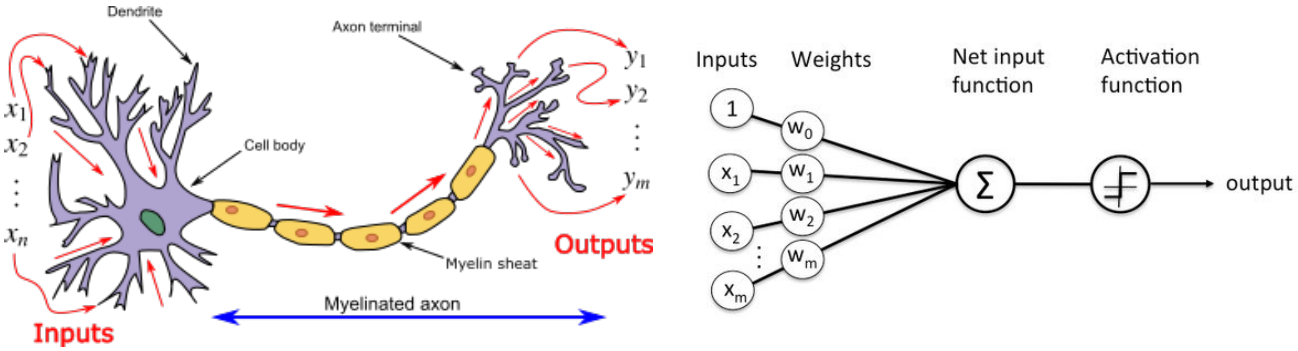

Figure 1: A brain Neuron vs an Artificial Neuron

https://pathmind.com/wiki/neural-network
https://en.wikipedia.org/wiki/Artificial_neural_network

The Artificial Neurons are that combined into a dense collection of layers to form the neural network (Figure 2)

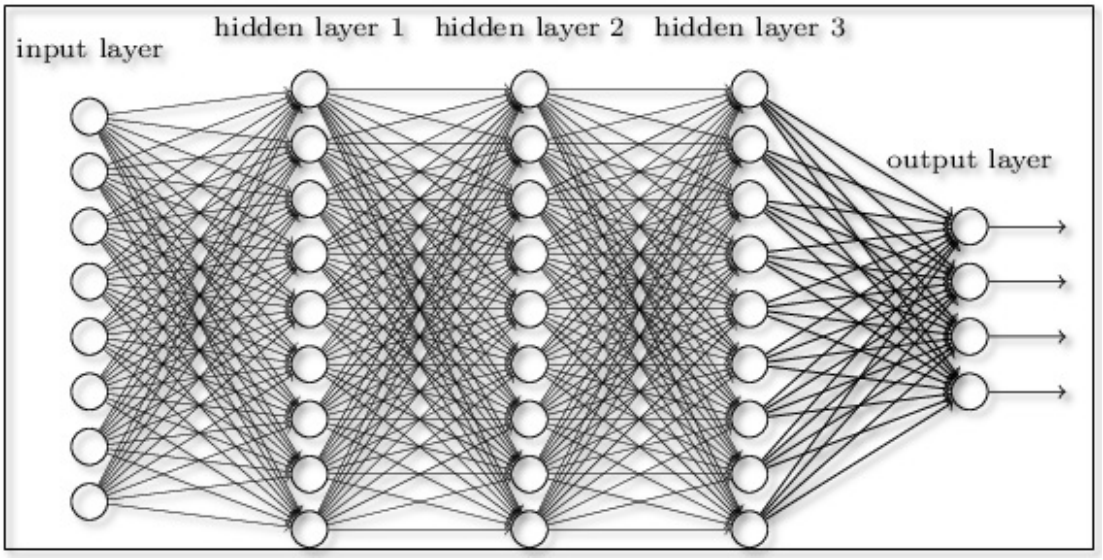

Figure 2 and Artificial Neural Network.

https://www.houseofbots.com/news-detail/1442-1-what-is-deep-learning-and-neural-network

With enough data sets (inputs), the neural networks "learn" by adjusting the weights until the desired outputs are achieved. This is known as the training phase. The trained neural network can then be used to recognize other data sets.

Some Applications of Machine Learning in the finance industry

Following are some areas where Machine Learning has been used in the Finance Industry (https://algorithmxlab.com/blog/applications-machine-learning-finance/)

Portfolio Management – Robo-Advisors	Online applications used to provide automated financial information.
Algorithmic Trading	Computers execute programmes with a predetermined set of instructions (an algorithm) for placing a trade on behalf of a trader.
Fraud Detection	Scan through vast data sets, detect unusual activities (anomalies), and flag them.
Loan/Insurance Underwriting	Based on historical consumer information, algorithms can look for patterns to decide if the application qualifies for a loan or insurance.
Document Analysis	ML used to scan and analyze legal and other documents to meet compliance requirements and combat fraud.
Money-Laundering Prevention	AI software used to collect internal, publicly-existing and transactional data to attempt to spot money laundering signs.

Conclusion

Neural Networks have essentially moved out of the labs and into practical use over the past decade or so and has shown great promise in areas which are difficult to address with traditional programming techniques.

Ethics inAI

By Peter Kua Seng Choy

Incorporating Ethical AI into Banking Innovations

Artificial intelligence (AI) is redefining financial institutions. Along with preventing payment fraud, enhancing the scope of anti-money laundering (AML) and offering 24/7 chatbot assistance to clients, AI is improving customer service standards and security, and is estimated to help banks save nearly $447 billion by 2023.

However, the endless possibilities offered by AI come with substantial risks. Only recently did Google apologise for the racist results produced by Vision AI, an automated image labelling software. The service labelled an image of a dark-skinned individual who was holding a thermometer as a "gun". And a picture of a light-skinned person was classified as an "electronic device".

Similarly, in 2016 Microsoft released a chatbot named Tay as an experiment in "conversational understanding". Although the company designed Tay to be friendly and engaging, within a few hours of its release, it posted highly derogatory tweets, influenced by the interactions it had online.

Such incidents highlight that AI can be deceived in numerous ways and can be manipulated by biased data. As a result, when banks decide to adopt AI into their system, they need to establish precise guidelines to maintain their usage as both ethical and explainable. Here are some of the critical standards that banks must deliberate over.

Customer Data and Privacy Protection

Customers have the right to safeguard their personal data, and it is the responsibility of the banks to enforce this protection against any forms of data thefts or misuse.

The European Commission implemented the GDPR standards, which established seven principles to grant more control to individuals over how their data is collected, in addition to regulations to maintain its integrity and confidentiality by businesses.

For surviving in a highly competitive environment, it is tempting for financial institutions to sell user data to maximise profits. Not only is this practice unethical, but it can also have severe implications on the privacy and security of their customers.

Banks must ensure that customer data does not end up in the hands of other businesses or data brokers. Otherwise, these entities will exploit the data to identify prospective customers and tailor their acquisition strategies for financial gains.

Customers must also be able to inspect the type of personal data used by their banks. They must have full liberty to revise or revoke any data exchange agreements with the financial institution.

Transparency in the Usage of AI

Many consumers do not realise that they are dealing with AI when they receive certain financial services. For instance, in the case of chatbots, a bank must inform its customers they are talking to a conversational AI and not a real representative. It will help the patron understand the limitations of such technology.

Customers are more likely to trust their bank when it is transparent with the type of technology it uses. Banks must also inform users about the kind of data the AI algorithm ingests and operates on to eliminate unjustified fear, such as the invasion of privacy.

AI systems must also be regulated only to collect the essential data it requires to perform the job efficiently. In the chatbot example, it will only need information such as the customer's name, phone number, and account details, to display their account balance on request. Collecting other data, such as the location history of the customer, is unnecessary and should not be done.

AI Explainability and Accountability

When employing AI for decision-making processes, banks must ensure they are fully aware of how the system works and how the algorithm forms a particular result. For instance, banks are starting to use alternative data for credit scoring with the help of AI to gain a three-dimensional overview of a customer's creditworthiness.

In such a situation, financial institutions must be competent enough to explain the data and assumptions applied. It will help customers improve aspects of their lives, such as prompt utility and rental payments, which are some of the alternative data used for credit scoring.

Banks need to have employees who are well-informed about how the AI system works, and they must be capable of explaining it to the customers. Otherwise, customers who are not tech-savvy will be perplexed by the system.

Similarly, clearly defined guidelines about the accountability of decisions made by AI need to be drafted out. Who will be responsible for the consequences of the algorithm's incorrect outcomes? Who has the decision-making authority, higher than the AI algorithm? We need to answer such queries before deploying AI.

Equal Treatment of Differences

One of the most debated ethical concerns of AI in banking is the racial discriminations it can cause due to thoughtlessly developed data sets used to train AI. Any forms of prejudices the system creates can be traced back to the creators who developed and taught it. AI systems must be free of any sorts of racial or economic preferences while making decisions.

While designing algorithms for AI, organisations need to have onboard stakeholders with varying skills and backgrounds. These people will help expose the AI to more diversity and improve its effectiveness in solving real-world issues.

Positive Impact on Workforce

Many repetitive tasks can be automated with the help of AI. But AI automation can adversely impact the jobs of specific segments of employees, making their skills look irrelevant to the bank.

Rather than replacing humans with AI, banks should focus on creating an alternative plan of action that utilises AI to add more precision to the task or reduce the burden placed on employees. Banks must also upskill employees to work alongside AI.

AI chatbots, for instance, can reduce employee workload by answering frequently asked questions and directing the more complex queries to human workers. AI can also very quickly calculate the risks associated with a customer accompanied by human oversight.

In Conclusion

Many consumers do not realise that they are dealing with AI when they receive certain financial services. For instance, in the case of chatbots, a bank must inform its customers they are talking to a conversational AI and not a real representative. It will help the patron understand the limitations of such technology.

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5 Ethical Considerations When Implementing AI in Banks

Although artificial intelligence (AI) is reshaping how financial institutions operate, it comes with substantial risks. There are various methods to deceive AI, and one of them is through data that is biased. When banks choose to implement AI into their system, they need to establish strict guidelines to maintain its ethical usage.

CUSTOMER DATA AND PRIVACY PROTECTION

- Customers have the right to protect their personal data
- Banks must ensure that customer data is not sold to third parties
- Customers must be able to scrutinise the kind of personal data used by the banks
- Customers can revise or revoke any data exchange agreements with the banks

TRANSPARENCY IN THE USAGE OF AI

- Banks must inform their customers when they are dealing with AI
- Banks must notify users on the type of data the AI algorithm works on
- AI systems must only collect the necessary data it requires to perform the job

AI EXPLAINABILITY AND ACCOUNTABILITY

- Banks must be aware of how the AI system works and how results are produced
- Banks need to have employees who are can explain their AI systems to customers
- The accountability of decisions made by AI need to be spelled out by banks

EQUAL TREATMENT OF DIFFERENCES

- AI systems must be free of racial or economic biasness when making decisions
- Banks need to involve stake-holders with different skills and backgrounds who will subject the AI to diversity and enhance its effectiveness in solving real-world issues

POSITIVE IMPACT ON WORKFORCE

- AI automation can render some human roles irrelevant to the bank
- Rather than replacing humans with AI, banks should exploit AI to add more precision to the task or lessen the burden placed on personnel
- Banks must upskill its workers to work alongside AI and to provide human oversight

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