

ML Unit 8 Seminar Preparation: Emerging Research in ANN:

Mach (2021) presents multiple possible use cases for Artificial Neural Networks in the business context. Among these are also use cases from the financial sector. Here, ANNs can, e.g., be used to identify fraudulent transactions, or make real-time decisions comparing risks and probable profits of certain business actions. Forecasts are available for a wide range of topics, including exchange rate changes, currencies, cryptocurrencies, stocks and futures.

As my background is in the usage of technology including but not limited to AI, I am mainly interested in the application of AI to prevent fraud or money laundering. Here, ANNs present an interesting method that is significantly superior to other, rule-based approaches. Traditional rule-based approaches of fraud prevention software in my experience often rely on a vast multitude of if-elif-else statements, focusing on fraudulent patterns that were already uncovered at some time in history. While this is a good start, it fights fraud with a backwards view, focusing on the past behaviour of criminals.

However, criminals develop their techniques. Here, we typically see that ANNs are better at uncovering new fraudulent patterns than the human eye alone. Discovering fraudulent patterns, in its nature, is a simple classification problem. The answer of the classification is always either “fraudulent” or “not fraudulent”. There is a vast amount of training data available for each financial institution from uncovered fraudulent activities or transactions proven to be not fraudulent. This data can be used to train an ANN and this way deliver a real benefit by allowing a future-looking fraud prevention where the algorithm does not only uncover known fraudulent patterns but also new ideas by criminals.

However, while the application of ANNs for fraud prevention is interesting, some challenges prevail. E.g., data security is an issue. It must be clarified which data can be used for the training of the algorithm. Especially since financial transaction data is sensitive, a sort of encryption mechanism must be applied.

I next go into more detail on general challenges and problems that ANNs might come with. The Centre of Data Ethics and Innovation (2019) has published a snapshot paper on the usage of AI in personal insurance which explores the transformative potential of AI in the personal insurance industry. They highlight that AI can enhance customer onboarding, pricing and claims management by enabling more precise risk assessments and screening out fraudulent claims. However, they also raise concerns about the ethical implications of the usage of AI in the insurance sector, particularly regarding data privacy and the risk of creating a class of people not getting any insurance anymore due to hyper-personalized risk assessments created by AI.

From the perspective of a customer, I see many concerns when using AI in personal insurance. Many AI models are known for their discrimination against certain groups. Here, it is possible that due to rigorous AI systems some societal groups are completely uncovered by insurance because none of the algorithms will offer them a policy due to, e.g., too many risk factors. It is also possible that other societal groups, while still being covered by insurance, need to pay a premium due to, e.g., racist reasons caused by the usage of biased and discriminative AI systems.

Furthermore, the analysis of location data from, e.g., social media pages like Facebook can be seen as a serious invasion of an individual's privacy. While systems that use this data to uncover fraudulent claims provide a value, it must at all times be considered how they affect our lives in a negative way. Advantages must always outweigh possible disadvantages. Also, we need to make a decision as society as to which degree of privacy we are willing to give up and for which purposes we are willing to give up our privacy.

A concern is also raised by the usage of personal data for the training of algorithms. Fear of breaches is sparked especially due to the frequency in which we nowadays see news of data breaches. Oftentimes, this data is taken without the consent of the individual. While these

issues can, to some extent, be mitigated by being transparent considering the data usage for AI systems, as long as this transparency does not exist it is related with uncertainty for many customers.

Additionally, it is possible that the usage of AI systems leads to behaviour shifts for consumers. Consumers might, e.g., be nudged to workout more regularly. While these sorts of behaviour shifts due to AI systems do not necessarily lead to worse behaviours, they can be seen as dictated by insurance companies. Here, we once again have to decide whether this is something that we are happy to introduce in our lives.

Overall, we see that there are a couple of risks associated with the usage of AI, especially in a field as sensible as personal insurance. Many important discussions on how we want this field to develop and which guardrails we deem necessary still have to take place. However, a general understanding of this ethical limitations of the usage of AI is important to guide our way towards a responsible handling of AI and data.

References:

Mach, P. (2021) 10 Business Applications of Neural Network.

CDEI (2019) Snapshot Paper - AI and Personal Insurance.