Unit 12 – Seminar – Future of Machine Learning

Introduction

After reading the article from Diez-Olivan et al. (2019) an understanding was grasped on the differences between descriptive, predictive and prescriptive machine learning models and how they are utilised within industry 4.0.

Predictive

The advantages to a predictive machine learning model within industry 4.0 standout more so than descriptive for a prognostic model. This is because it allows prediction of a time a fault kin monitored equipment will occur, and eventually its severity and coverage (Diez-Olivan et al., 2019). A key advantage is that this model is that it almost builds upon the descriptive model of analysing historical data and forecasts future events whereas a descriptive model does not have the ability to forecast and in turn can just detect anomalies within patterns based on recorded data. Where industry 4.0 focuses on the internet of things and big data we see predictive modelling used often in credit risk involves the use of statistical and machine learning techniques to assess the likelihood of borrowers defaulting on loans or credit. These models help financial institutions make informed decisions by predicting the probability of default, loss given default, and exposure at default (Gupta, 2024). Other cases where predictive modelling is used in industry 4.0 for finance as a prognostic machine learning model include fraud detection.

Prescriptive

When looking into how prescriptive models function, prescription seems like an extension of both descriptive and predictive models. Prescriptive prognosis models aim at reducing the chances of a fault occurring by modifying working parameters and variables (Diez-Olivan et al., 2019). The overall aim is to

optimise a process and to maximise efficiency. This aim aligns not only with industry 4.0 but also with industry 5.0 where there is a shift from welfare to wellbeing and the wellbeing of the worker at the centre of the production process where new technologies are used to provide prosperity beyond jobs and growth while respecting the production limits of the planet (Kraaijenbrink, 2022). An example of this in practice is in healthcare where prescriptive modelling is beneficial for scheduling in terms of capacity and workflow planning– e.g., of operations, emergency departments and healthcare resources (Oesterreich et al., 2020).

Conclusion

In conclusion I would argue that a prescriptive model would be best to build a model around for both industry 4.0 and industry 5.0. This is primarily due to the fact that there is more human input with a prescriptive model thus, making it a lot more ethical than a predictive model. Where in the past predictive models have had racial bias embedded within their algorithms for a system that was used to support healthcare decisions (Leavy, O'Sullivan and Siapera, 2020). A prescriptive model would also consider guidelines and constraints like regulations and laws, as well as local preferences.

Reference List:

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Kraaijenbrink, J. (2022). *What Is Industry 5.0 And How It Will Radically Change Your Business Strategy?* [online] Forbes. Available at: https://www.forbes.com/sites/jeroenkraaijenbrink/2022/05/24/what-is-industry-50-and-how-it-will-radically-change-your-business-strategy/.

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