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Predicting self-exclusion using machine learning

What this research is about

Online gambling has become an important aspect of the gambling landscape. People who gamble online tend to experience more gambling problems. This is due in part to the easy availability of online gambling. But online gambling also results in a large collection of data. This allows for gambling behaviour to be monitored over time, which is called behavioural tracking. Behavioural tracking data could be used to identify people at risk of experiencing problem gambling.

Previous studies on behavioural tracking are limited to Europe with a small number of data sets. These studies have provided mixed results. Generally speaking, the frequency (e.g., number of active betting days) and intensity of gambling (e.g., bet size) are important predictors of problem gambling. Other important predictors include playing many different types of gambling activities and variability in betting pattern. It is known that people with gambling problems tend to vary their bet size more.

A potential difficulty of using behavioural tracking data is identifying people with gambling problems. Voluntary self-exclusion (VSE) could be a potential marker of problem gambling. In VSE, people can ban themselves from a gambling site for a set period of time. Studies have suggested that people who enroll in VSE are likely to experience problem gambling. In this study, the researchers used machine learning to predict VSE using online gambling data from Canada. Machine learning uses computer programs to build models to predict an outcome (in this case, VSE).

What you need to know

People who gamble online may experience more gambling problems. This could be due to the easy availability of online gambling. However, online gambling allows for people's gambling behaviour to be tracked over time. This is called behavioural tracking. In this study, the researchers used behavioural tracking data to predict voluntary self exclusion (VSE), which might be a sign of problem gambling. The researchers obtained data from a provincially owned online gambling site in Canada. The de-identified data set contained 2,157 players who had a record of VSE and 17,526 who did not.

The researchers selected 20 variables as predictors of VSE. The variables included measures of gambling frequency, intensity, and variability. Overall, the variables predicted VSE well. The most important predictor of whether a player had a record of VSE was variability in the amount of money bet per session. It captured unusual betting patterns that fluctuated a lot in the amount of money bet. Another important predictor was Bets per Day. Variance in Money Bet per Session and Bets per Day together accounted for 58% of the predictive signal. Overall, behavioural tracking data could be used to identify and intervene with people experiencing problem gambling.

What the researchers did

The researchers obtained anonymous data from the eCasino section of PlayNow.com. PlayNow.com is the online gambling platform of a provincially owned gambling operator in British Columbia, Canada. The eCasino section offers online slot machine and table

games. The full data set consisted of 30,902 individual players who made over half a billion bets between October 2014 and September 2015. Of the total players, 2,458 had a record of VSE. Some of the participants did not engage in much gambling during the data period. The researchers analyzed data from players who made at least 200 bets in the year. This resulted in a final sample of 2,157 players who had a record of VSE and 17,526 who did not.

The researchers selected 20 gambling variables that might be important predictors of VSE. The variables included measures of frequency, such as the number of days bet. They also included measures of intensity such as the average bet size. Lastly, the researchers included measures of variability, such as the number of different games played. These 20 variables were used as inputs for the computer models to predict VSE. The researchers also looked at if certain gambling variables were better predictors of VSE.

What the researchers found

The researchers found that the 20 variables selected were good at predicting VSE. An Area Under the Receiver Operating Characteristic curve (AUROC) of 1 would identify a perfect prediction. A value of 0.5 would be random. In this study, the computer model resulted in an AUROC value of 0.75.

The variable that was most predictive of VSE was variance in the money bet per session. This variable captured unusual betting patterns that fluctuated a lot in the amount of money bet. For example, making large bets in some (but not all) sessions. It might reflect loss chasing or inconsistent access to money for gambling (e.g., gambling after paydays). The next most important predictor was bets per day, followed by distinct games per session. The model's performance was robust when the researchers used a balanced dataset and changed the threshold for the minimum number of bets.

How you can use this research

This research could be used by gambling operators to create risk scores to identify people who are at risk or are experiencing problem gambling. The risk scores could then be used to intervene to prevent further

harm. Researchers could include other measures of problem gambling when using machine learning to identify gambling problems.

About the researchers

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Citation

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