Title: Beyond Static: Segmenting Gamblers by Mining Payments Sequence Data

Abstract: A considerable body of gambling-related research has addressed the task of segmenting a sample population of gamblers into homogenous sub-groups. Typically, "static" features are used as model inputs for cluster analysis, where variables are aggregated for each individual over a specified period of time; for example, the total amount wagered per gambler over the course of a study period. Engineering features in this way fails to capture the intricacies of a gambler's behavior over time. Recent works have begun to address this limitation by using time-series data as model inputs and by employing trajectory analysis. While these methods incorporate the changeability in a single variable over time (e.g., the number of bets made over time) they fail to encapsulate interactions between multiple variables and the *sequentiality* of a gambler's behavior over time.

In this presentation we present our methodology and results from an analysis of gamblers' payments transaction data. We move beyond the use of static aggregated variables and traditionally formatted time-series data. Instead, we pre-process our data so that model inputs reflect a sequence of payment events per gambler (e.g., deposits, withdrawals, declines, etc.). We model gamblers' behavior based on a Markov model and extract common patterns via cluster analysis.

Implications: We make significant methodological contributions that can help guide future work toward more dynamic analysis and modelling strategies of gambling behavior. More practically, the results are useful for gambling payment providers in designing, managing, and developing their users' experience and their complimentary customer service and marketing initiatives.

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