Precision and Ethics in Sports Betting: Evaluating the Impact of AI on Prediction Accuracy and User Trust

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Abstract

This study investigates the role of AI-based sports prediction apps in enhancing the accuracy and efficiency of betting decisions. Focusing on popular U.S. sports leagues like the NFL, NBA, and MLB, this research will analyze key informatics principles—such as algorithm design, ethical transparency, and user interface (UI) design—that contribute to reliable predictions and improve user trust. As sports betting apps gain popularity, there's a growing need to understand how these apps can provide accurate, data-driven insights that support responsible betting practices. This study will utilize a mixed-method approach, including observational studies, simulation analyses, and user interviews, to examine the effects of AI on betting accuracy and user experience. The research is targeted at adults aged 21 to 35 in states where sports betting is legal, including major betting platforms like DraftKings, FanDuel, and BetMGM. This research hypothesizes that a user-friendly interface, advanced predictive algorithms, and transparent risk assessment features will increase the reliability, accuracy, and ethical appeal of AI-based sports prediction tools.

Introduction

The integration of AI technology into mobile betting apps has transformed the sports betting industry, especially in the United States, where recent legal changes have enabled betting across many states. This shift allows sports enthusiasts to place bets on popular leagues like the NFL, NBA, and MLB directly from mobile platforms. This study focuses on AI's potential to improve the betting experience by enhancing prediction reliability while also promoting responsible gambling. U.S.-based platforms such as DraftKings, FanDuel, and BetMGM dominate the market and provide an ideal context for analysis, as they are widely used by sports fans and feature AI-driven predictions that play a critical role in user engagement and betting behaviors. AI in sports betting presents several advantages, including reducing biases in predictions and offering data-driven insights to inform betting decisions; however, it also raises ethical concerns. For example, the accessibility of mobile betting has increased worries about gambling addiction, further complicated by targeted advertising and the high bonuses offered to new users (Hing et al., 2017). This proposal addresses these concerns by examining how AI in sports betting apps can provide accurate, transparent predictions that help users make responsible decisions. Motivated by personal experiences with sports betting losses, this study explores how AI might balance predictive accuracy with ethical considerations, giving bettors tools for informed, controlled betting choices. To refine the research focus, this study will center on three major U.S. sports leagues with high fan engagement: the NFL, NBA, and MLB. The target audience consists of adults aged 21 to 35 in states where sports betting is legally sanctioned, such as New Jersey, Pennsylvania, and Nevada, and key platforms like DraftKings, FanDuel, and BetMGM will serve

as focal points for analysis, as they highlight the benefits and challenges of machine learning in betting environments.

Literature Review/Prior Work

AI holds significant promise in the sports betting industry, though research into its broader implications, including ethical design and user impact, remains relatively limited. Initial studies indicate that AI can improve betting accuracy by reducing the human biases that often impact prediction-making. Companies leading the way in AI-driven betting, such as Stratagem and Stats Perform, showcase AI's potential by analyzing large datasets—including player statistics, historical game data, and even real-time weather information—to generate accurate predictions (Sahota, 2024). This shift underscores how AI might make sports betting a more data-centric, strategic activity, contrasting sharply with the often impulsive nature associated with traditional gambling. For instance, an impressive demonstration of AI's predictive accuracy comes from research on the 2015 Rugby World Cup, where a random forest classification algorithm achieved an accuracy rate of 89% in predicting match outcomes, surpassing the 85% accuracy rate of human decision-based platforms like Super-Bru and OddsPortal (Pretorius, 2016). Such results affirm that machine-learning approaches are not only reliable but also offer comprehensive data analyses, supporting a more informed betting process. However, while these studies highlight the technical benefits of AI, they also underscore the need to understand which specific informatics principles play key roles in ensuring the success of AI-driven predictions.

Trustworthiness is another crucial factor in AI-driven sports betting, as users need to be assured of the integrity and accuracy of the predictions they rely on. According to Kaur et al. (2023), elements like fairness, explainability, and accountability are essential for establishing trustworthy AI, especially in applications where financial risk and user wellbeing are at stake. By incorporating these principles, AI-powered sports betting apps can offer ethical transparency, allowing users to understand how predictions are derived and thereby fostering a more informed and conscientious betting environment. Furthermore, user interface (UI) design is vital in making complex AI predictions accessible, ensuring that users can easily navigate betting platforms and interpret data-driven insights. Adekunle's (2023) research indicates that intuitive UI design not only enhances usability but also builds user trust, promoting a more thoughtful engagement with AI-based predictions.

Despite these promising developments, substantial knowledge gaps remain, particularly concerning the influence of informatics principles on the accuracy, efficiency, and ethical integrity of AI in sports betting. This study aims to address these gaps by exploring key factors—such as data processing methods, predictive modeling, and user interaction—that are likely to impact the effectiveness of AI-driven sports prediction systems. Through a focus on establishing ethical, transparent, and user-friendly AI tools, this research ultimately seeks to

identify best practices that align with users' needs and promote responsible gambling habits, thus contributing valuable insights to the evolving field of AI in sports betting.

Research question(s)

Therefore, the proposed study seeks to understand this problem by addressing the following research questions:

Central Research Question: What informatics principles increase the accuracy, efficiency, and trustworthiness of predictions made by AI-based sports betting apps?
Additional Question: How does the user interface design of these apps affect user interaction, engagement, and trust in AI-generated predictions?

Research design

This study utilizes a comprehensive mixed-method approach that combines observational studies, simulation analysis, and user interviews to delve deeply into AI's impact on sports betting behavior, prediction accuracy, and user satisfaction. First, a two-week observational study will involve four groups of ten active sports bettors. Of these, three groups will each use a different AI-based betting app—labeled "Juke Picks," "ChocSpo," and "Rithimm"—while a fourth control group will place bets without AI assistance. This setup allows for a comparative analysis of the apps' influence on key metrics such as betting frequency, win rates, decision-making time, and user engagement with various app features. By observing bettors in real-world conditions, the study will capture unbiased data that reflects how AI tools may shape betting behaviors differently across various platforms, shedding light on any distinct patterns associated with each app.

Following the observational period, each participant will be invited to a one-on-one interview to gain qualitative insights into their experiences with the apps. Interview questions will explore usability, prediction accuracy, the perceived transparency and ethical considerations of the AI tools, as well as overall satisfaction with the betting experience. These in-depth interviews will provide valuable context to the quantitative data from the observational study, helping to reveal the nuances of user trust and decision-making in AI-driven environments. Additionally, questions will probe how intuitive and easy-to-navigate each app felt to the user, along with any ethical concerns or instances where the AI's predictions influenced users' betting behaviors, either positively or negatively.

To further evaluate prediction accuracy, the study will also include a simulation analysis, where the research team will run controlled predictive scenarios across the three AI-based apps. This simulation will involve various test scenarios to assess each app's reliability and accuracy in making predictions. By examining the outcomes across multiple scenarios, the simulation

analysis will generate objective data on each app's predictive consistency, offering a comparative view of their strengths and limitations. This stage of the study is essential to identify which specific informatics principles are most successful in enhancing prediction accuracy and user trust.

Together, these methods will contribute to a holistic analysis of the informatics principles driving accuracy, efficiency, and ethical transparency within AI-based sports prediction tools. The observational study and interviews will offer insights into real-world user experiences and perceptions, while the simulation analysis will provide empirical evidence of each app's predictive effectiveness. This multi-faceted approach ensures a thorough understanding of how AI can best support responsible and accurate betting practices in the sports betting industry.

Generating data

Data generation in this study will be facilitated through the three primary research methods—observational studies, interviews, and simulation analysis—providing a robust mix of both qualitative and quantitative insights into AI's role in sports betting. First, the observational study will produce four distinct sets of quantitative data, capturing essential aspects of user behavior such as betting frequency, success rates, and engagement patterns across different apps. These metrics will be grouped by app type to enable a detailed comparison between the AI-supported groups and the control group, offering insights into how AI influences betting habits and decision-making in a real-world context. This structured data collection allows for an organized assessment of each app's impact, revealing trends in user behavior based on whether or not AI is used.

In addition to the observational data, one-on-one interviews will yield qualitative data, providing depth and context to the observed behaviors. Interview responses will be coded and analyzed to identify recurring themes related to trust, usability, ethical transparency, and overall satisfaction with the AI-based betting experience. These themes will be cross-referenced with the observational data, enabling the research team to pinpoint connections between user perceptions and their actual betting outcomes. This approach helps to reveal how users feel about the AI's role in their betting decisions, whether it reinforces trust and responsible betting practices, or raises concerns about ethical transparency and usability. Themes emerging from the interviews will shed light on users' subjective experiences, deepening our understanding of how AI-driven predictions shape bettors' interactions with these apps.

Lastly, simulation analysis will provide additional quantitative data, focusing on the predictive performance of the AI algorithms in a controlled environment. By running multiple predictive scenarios across each AI-based betting app, the simulation analysis will generate objective data that measures the consistency and accuracy of each app's algorithms. This data will reveal each

app's predictive strengths and limitations, establishing benchmarks for evaluating AI's effectiveness in sports betting predictions. This simulation data will help to identify which specific informatics principles—such as data processing techniques and predictive modeling—are most effective in enhancing prediction accuracy, reliability, and user trust.

Through this multifaceted approach, the study will produce a rich dataset that combines real-world user behavior, subjective user insights, and empirical measures of algorithmic performance. Together, these data sources will support a comprehensive evaluation of how AI can enhance accuracy, efficiency, and ethical transparency in sports betting apps, ultimately guiding the development of best practices for responsible and effective AI-driven sports prediction tools.

Analyzing data

The data analysis phase of this study will integrate findings from the observational study, interviews, and simulation analysis to address the central research question regarding informatics principles that enhance AI-driven sports prediction accuracy and reliability. Quantitative data from both the observational study and simulation analysis will be examined using statistical methods, allowing for comprehensive comparisons between different user groups and betting apps. By analyzing metrics such as success rates, betting frequency, and predictive accuracy, the study will identify patterns and differences across AI-assisted and control groups, offering valuable insights into how AI impacts betting behavior and outcomes.

Meanwhile, qualitative data from the interviews will undergo thematic coding to uncover recurring themes related to user trust, usability, user interface (UI) design, and ethical transparency. This thematic analysis will shed light on users' perceptions of AI's role in their betting experiences, focusing on how the design and ethical considerations of these tools affect user satisfaction and engagement. The coded themes from interviews will then be cross-referenced with the quantitative findings, enabling the study to draw connections between users' subjective experiences and their actual betting performance or behaviors observed in the quantitative data.

By combining these quantitative and qualitative insights, the analysis will provide a multi-dimensional view of how AI tools influence user behavior, trust, and overall satisfaction in sports betting apps. This integrative approach will help pinpoint the specific informatics principles—such as algorithmic transparency, intuitive UI design, and ethical risk warnings—that contribute most effectively to the accuracy, efficiency, and ethical integrity of AI-powered sports predictions, guiding recommendations for responsible and effective AI integration in the sports betting industry.

Ethical considerations

Given the addictive nature of gambling, this study prioritizes ethical safeguards to protect participants from potential harm. Ethical preparations will begin with a thorough informed consent process, wherein participants will receive detailed information on the financial and emotional risks associated with betting apps, including the potential for stress or loss. Each participant will be required to sign a consent form acknowledging these risks, as well as watch an informational video outlining the study's purpose, methodology, and possible impacts. This ensures that participants fully understand the implications of their involvement.

To further support participants who may experience negative outcomes, such as financial loss or signs of gambling addiction, the research team will make resources available for assistance. These include covering financial losses up to $1,000 for any participant impacted by the study and offering access to rehabilitation support services at no cost if required. This proactive approach aims to mitigate harm and provide a safety net for those who may be affected by their engagement with AI-driven betting apps during the study.

In addition to supporting participant welfare, the study will adhere to legal and ethical standards by conducting research exclusively in jurisdictions where the use of third-party AI in sports betting is legal. This ensures compliance with local laws and maintains the integrity of the study, which is committed to observing ethical boundaries while exploring the effects of AI on sports betting behavior. Together, these measures establish a foundation of ethical responsibility, prioritizing participant protection while enabling valuable insights into the intersection of AI and gambling.

Discussion

This research goes beyond simply evaluating the financial success or accuracy of AI-driven sports betting tools; it also delves into the ethical implications of integrating AI into gambling, particularly in an industry where responsible practices are critical. By investigating informatics principles that support prediction accuracy, user trust, and ethical transparency, the study aims to offer insights that promote safer, more responsible betting behaviors. The findings could contribute significantly to industry standards, providing guidelines for AI-driven betting applications that are not only optimized for effectiveness but also consciously designed to minimize the risks of gambling addiction.

Furthermore, by emphasizing ethical transparency, this study advocates for AI features that empower users to make informed decisions, such as accessible information on prediction models, transparent risk assessments, and user-friendly designs that encourage controlled betting. This approach supports a balance between innovation in predictive accuracy and the need to protect users' well-being. The outcomes of this study may also encourage further research in the ethical

design of AI, helping to bridge current knowledge gaps on creating AI tools that prioritize user safety alongside technical performance. This broader understanding could guide future advancements in AI-driven gambling tools, reinforcing the importance of responsible, ethically-informed design as a core principle in the evolving landscape of sports betting technology.

Conclusions

In conclusion, this research seeks to uncover the informatics principles that drive accuracy, efficiency, and user trust in AI-based sports prediction apps, offering critical insights into how these technologies can responsibly reshape the sports betting landscape. In addition to examining the core algorithms that enhance prediction reliability, the study will explore how user interface (UI) design influences user engagement, satisfaction, and trust, aiming to present a comprehensive understanding of AI's potential to promote responsible betting practices. By synthesizing data from observational studies, simulation analyses, and user interviews, this research provides a well-rounded analysis that highlights the importance of ethical, user-centered approaches in AI-driven sports betting apps. The findings from this study could inform future developments and set new standards in the design of responsible, transparent, and effective AI technologies within the sports betting industry.

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