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論文題目	An Efficient Aspect-Based Sentiment Analysis Framework for Esports Game Reviews
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論文の内容の要旨

This dissertation introduces an innovative framework for analyzing player feedback in esports games, with a focus on advanced data analysis to understand player emotions and game dynamics. The study begins with a comprehensive background, theoretical models, and empirical research on the proposed framework, introducing key concepts and terminology related to esports and player feedback analysis.

Initially, the research presents a thorough data analysis framework aimed at addressing the complex issues in esports player feedback. Utilizing a large dataset of approximately eight million reviews from major esports games on Steam and Google Play, including titles like PUBG, Dota2, CS:GO, and PUBG Mobile, the study offers a comprehensive analysis of player feedback. We enhance the topic modeling and sentiment analysis in this framework with the power of Transformer architecture, significantly improving the accuracy in interpreting player emotions and game dynamics. This method provides a novel approach to player feedback analysis, consistent with the statistical interpretation used in traditional data analysis.

The research also involves comparative analyses with existing models using popular evaluation methods in machine learning. The experimental results reveal that game optimization, server connectivity, anti-cheat mechanisms, and game updates are the top priorities for esports players currently. Generally, the insights not only demonstrate the ability of the enhanced topic modeling to reveal themes and sentiment analysis to uncover player emotions within the noisy feedback but also further illustrate the framework's completeness and the indispensable nature of each of its components. They are crucial for identifying common issues that resonate across different player groups, and invaluable for strategizing around game updates, community engagement, and player-centric approaches in game development. The adaptability and scalability of the framework make it an essential tool for the success of esports games.

Finally, the dissertation lays the foundation for future esports analytics research. It emphasizes the importance of advanced and detailed analytical tools in the evolving esports industry and their role in strengthening the symbiotic relationship between game developers and player communities. The research has been rigorously tested on various benchmarks, outperforming existing analytical models in efficiency, scalability, and depth of analysis. In summary, this dissertation provides a comprehensive and effective tool for analyzing player feedback in esports games, making a significant contribution to the field of esports analytics.

Keywords: Esports Gaming, Novice Player Experience, Player Feedback Analysis, Topic Modeling, Sentiment Analysis

論文審査の結果の要旨

Electronic sports (eSports) have emerged as a rapidly growing economic and business sector essentially associated with leisure and competition [Chikish et al., 2019]. This research aims at providing a thorough data analysis framework to address several challenging issues in esports player feedback. Basically, the main objective of this dissertation is to develop an automated methodology for analyzing and interpreting the large amount of game reviews generated by novice players on esports platforms to improve the understanding of players' experiences that would potentially support game developers and community managers in their strategies for game updates and community engagement. The main contributions are summarized as follows.

This research proposed an aspect-based sentiment analysis framework for extracting insights from extensive game reviews within the esports domain. The proposed framework integrates topic modeling and sentiment analysis techniques to provide agile and informed responses to market demands and player feedback. Within this framework, a hybrid methodology was also introduced that combines Latent Dirichlet Allocation (LDA) for topic modeling and the BERT model for end-to-end aspect-based sentiment analysis. Experimental results demonstrated the methodology's effectiveness in extracting meaningful insights from unstructured text data as well as its feasibility and efficacy.

This dissertation has made good contributions both methodologically and experimentally in the area of sentiment analysis and players' experience mining in esports domain. The research work presented in this dissertation has resulted in one journal paper and four refereed conference papers.

In summary, Mr. YU Yang has completed all the requirements in the doctoral program of the School of Knowledge Science, JAIST and finished the examination on February 01, 2024, all committee members approved awarding her a doctoral degree in Knowledge Science.