

Developing a new type of recommendation system based on interdisciplinary research in the gaming area

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【Purpose and content of research】

In today's world, most recommender systems are developed using content-based filtering, collaborative filtering, or hybrid approaches. However, these systems suffer from inherent problems such as limited content analysis, sparse matrices, cold start, and overspecialization issues. Each of these problems can be a specific research topic, and none has a perfect solution. Therefore, I propose looking at these problems from a different perspective. The critical issue is that current recommender systems do not understand "consumer needs" or "motivations that attract consumers to buy a product."

As a result, my research project is based on interdisciplinary research and focuses on developing a new type of recommendation system that incorporates psychology, particularly for the gaming industry in Japan. This research becomes more relevant during the period when the COVID-19 pandemic severely affected the global economy, causing it to shrink by 4.4% in 2020 according to the IMF (International Monetary Fund). However, the gaming market is expected to grow at a healthy CAGR (2019 to 2024) of +8.7%, reaching \$218.7 billion in 2024. By 2021, the number of players had reached 3 billion, which accounts for one-third of the world's population.

Thus, my series of research projects aim to study gaming-related issues and cross-cultural investigations. As part of my PhD dissertation, I have already created the VBR system (Value-Based Recommender system), making it an original contribution. Now, my goal is to further enhance this system and introduce a new version called the EVBR system (Enhanced Value-Based Recommender system). The EVBR system is expected to provide even higher accuracy in recommendations compared to its predecessor. Additionally, I plan to develop the EVBR system through cross-cultural and interdisciplinary research, with a specific focus on gaming-related issues.

【Research achievement (acquired knowledge, results, research papers, conference presentations, potential applications for external research grants through this research project)】

To explore gaming-related research and develop a tailored recommendation system for gaming, I have utilized this funding to procure equipment like the Nintendo Switch and a projector screen. (And because I became a member of Shimane University last year, I need to purchase some essential equipment to build my lab for research) These tools will facilitate research endeavors with both myself and my students for this project. Our investigation covers various gaming themes including understanding fighting games, puzzle games, RPGs, and delving into the motivations and values of players across different desired. We have devised pertinent experiments and intend to

invite participants for further data collection. Currently, my five students and I are actively immersed in research activities associated with this project, aiming to present initial findings by year-end. Given that this project aims to longitudinally gather data on players' values and motivations to develop a specialized recommendation system for games, I anticipate its duration spanning multiple years.