RESEARCH DETAIL

INTELLIGENT FINANCIAL PRODUCT RECOMMENDATION SYSTEM

An application of AI technology in bank and financial fields.

PROJECT OVERVIEW

- The project integrate multiple advanced technologies, such as data analytics, machine learning, and AI, while leveraging customer data to generate personalized financial product suggestions.

PROJECT BACKGROUND

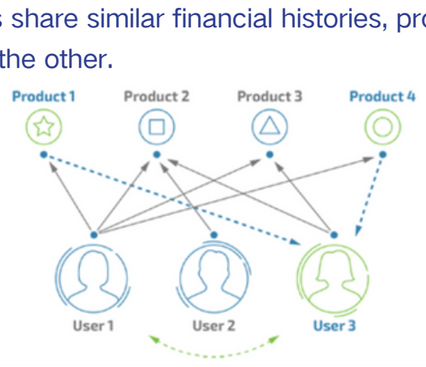
- In the rapidly evolving financial landscape, personalized customer experiences have become a critical differentiator for financial institutions. An Intelligent Financial Product Recommendation System leverages advanced technologies such as machine learning, artificial intelligence (AI), and big data analytics to deliver tailored financial product suggestions to individual customers. These systems analyze vast amounts of data to understand customer preferences, behaviors, and financial needs, thereby enhancing customer satisfaction and driving business growth.

PROBLEM TO SOLVE

- The development of an Intelligent Financial Product Recommendation System addresses the critical need for personalization in financial services. By leveraging advanced technologies such as AI, machine learning, and big data analytics, financial institutions can overcome existing challenges and seize new opportunities to enhance customer satisfaction, drive revenue growth, and maintain a competitive edge in the market.

COLLABORATIVE FILTERING

Recommends products based on the preferences of similar users. For example, if two users share similar financial histories, products favored by one might be relevant to the other.



$$\rho_{X,Y} = \frac{\sum XY - \frac{\sum X \sum Y}{N}}{\sqrt{(\sum X^2 - \frac{(\sum X)^2}{N})(\sum Y^2 - \frac{(\sum Y)^2}{N})}}$$

$$distance(X,Y) = \sqrt{\sum_{1}^{N}(x_i - y_i)^2}$$

CONTENT-BASED FILTERING

Recommends products based on the specific features of the products and the customer’s preferences. For instance, if a customer shows interest in low-risk investments, the system would suggest similar products.

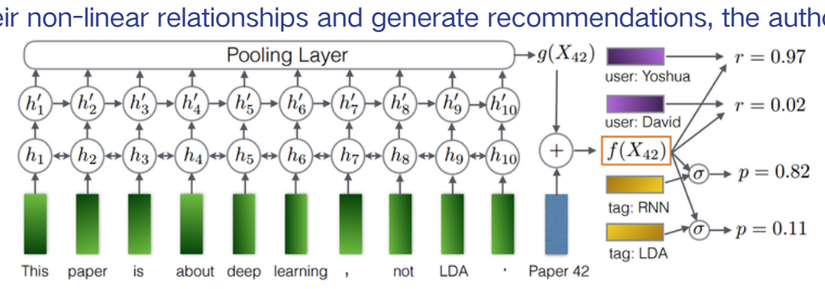
$$\frac{p_{item}(like|user_{features})}{p_{item}(dislike|user_{features})}$$

INTEGRATED LEARNING

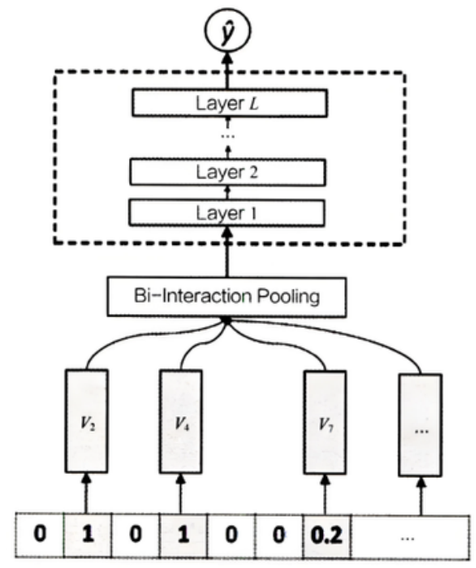
Combining recommendation results through multiple models decision trees and random forests to further improve recommendation accuracy.

DEEP LEARNING MODELS

Deep learning of user behavioural data, complex features of products, and time series data to capture their non-linear relationships and generate recommendations, the author used the RNN



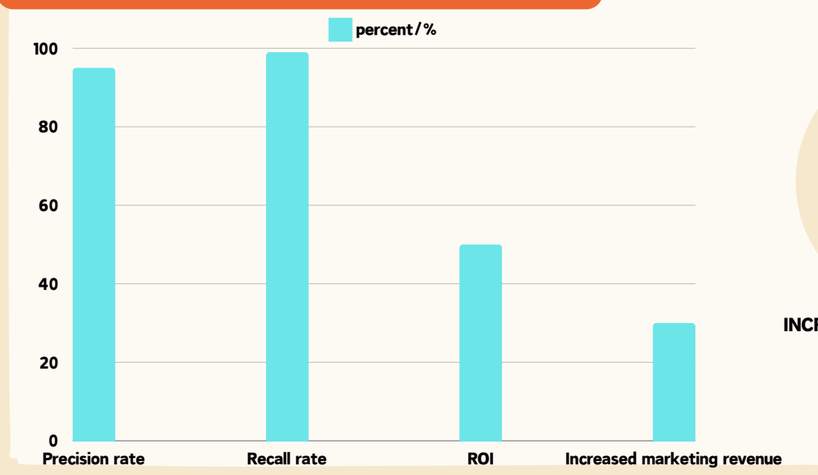
- Embedding layer: represents user and product features as low-dimensional vectors.
- Hidden Layer Network: non-linear mapping of input data through multi-layer neural networks to extract complex relationships.
- Output Layer: predicts user preferences or ratings for unseen financial products.

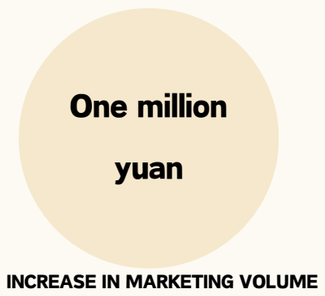


CITATION

1.Bansal T , Belanger D , Mccallum A .Ask the GRU: Multi-Task Learning for Deep Text Recommendations.2016[2024-10-14].DOI:10.1145/2959100.2959180.
2.Orvila Sarker, Asangi Jayatilaka, Sherif Haggag, Chelsea Liu, M. Ali Babar,A Multi-vocal Literature Review on challenges and critical success factors of phishing education, training and awareness,https://doi.org/10.1016/j.jss.2023.111899.

PROJECT OUTCOMES





CONCLUSION

- The Intelligent Financial Product Recommendation System aims to enhance customer experience by providing personalized financial product recommendations, such as loans, credit cards, and investment options. By utilizing machine learning algorithms and big data analytics, the system analyzes customers' financial behavior, preferences, and demographic information to suggest products that align with their specific financial needs and goals.

contact me :19302010047@fudan.edu.cn