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[System] Google's multitask ranking system
<https://daiwk.github.io/assets/youtube-multitask.pdf>

Introduction

In its simplest terms, text mining, also called text data mining, entails obtaining high-quality information from texts. It comprises discovering new, formerly unknown information via computers, by extracting information automatically from a variety of written resources. The process employs various techniques that transform unstructured texts into structured formats to find new insights and meaningful patterns (Betancourt & Ilarri, 2020). For their execution, these text mining techniques, in most cases, utilize various text mining applications and tools, including information extraction, information retrieval, categorization, clustering, and summarization.

Summary

The article “Recommending What Video to Watch Next: A Multitask Ranking System” by Zhao *et al.* (2019) presents a large scale multi-objective ranking system that utilizes that utilizes the aforementioned text mining techniques to recommend to user what videos to watch next on an industrial video sharing platform like Netflix. The system recommends videos based on the video that an individual is watching at that moment or previously. To do this, the recommendation system follows a 2-phase design with a candidate generation and a ranking. In the ranking stage, the system retrieves a number of candidates from the candidate generation (for instance, neural models or matrix factorization), and applies a complex large-capacity technique that ranks and sorts the items that show the most potential.

The ranking system works by learning from 2 forms of user feedback: a) engagement behavior, like watches and clicks; and b) satisfaction behavior, like dismissals and likes. Given various candidates, the ranking system makes use of the candidate features, context and query as input, and learns to predict the behavior of various users. Given a context, candidate, and query, the ranking model is able to predict the user's probability of taking actions like dismissals, likes, watches, and clicks.

That technique of providing predictions for individual candidates is referred to as a point-wise approach, which contrasts list-wise or pair-wise approaches, which learn making predictions on ordering of 2 or more candidates. List-wise or pair-wise approaches can be utilized for potentially improving the recommendations' diversity. The author opts to utilize point-wise ranking essentially based on serving considerations. At serving time, the approach is efficient and simple to scale to a huge amount of candidates. This is contrary to list-wise or pair-wise approaches which entail scoring lists or pairs several times so as to get the ideal ranked list given a collection of candidates, in that way limiting their scalability.

Conclusion

Zhao et al. (2019) work introduces a recommender system that utilizes various text mining techniques to provide video suggestions to Netflix and other video sharing platform users. The utilized techniques, such as the light-weight and effective method, and Multi-gate Mixture-of-Experts model architecture extension, among others help deal with some of the associated real-world challenges in designing and development of industrial recommendation systems (for example, the presence of numerous competing ranking objectives, and implicit selection biases in user feedbacks), particularly ranking systems. These solutions incorporate and integrate the tools of computational linguistics, statistics, machine learning, data mining, and information

retrieval, to ensure efficiency in recommender systems' operations in various video sharing platforms. To demonstrate the utilized techniques' efficiency in improving recommender systems' engagement and satisfaction metrics, live tests were conducted on YouTube, one of the world's chief video sharing platforms.

References

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