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The network side estimates the end-user video experience model

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Abstract: Web watching is the video consumption mode of most consumers at present. With the development of network and technology, more and more people use the Internet to watch videos. The traditional video consumption mode tends to be lonely. The quality of the user experience directly affects the user to the player, the evaluation of the software development company will also affect the user experience of the network video viewing mode of consumption. As a result, the video player user experience evaluation and the popularity of the player has a strong correlation, from hardware and software as well as technical enhancements to help the development company to win the market, but also conducive to the vigorous development of network watching.

During the network watching process, the user's evaluation directly depends on the video quality, the initial buffering delay and the kappa ratio, the video quality is selected by the user, but the initial buffering delay and kappa ratio are affected by the initial buffering peak rate, E2E RTT, play stage download rate, and establish a functional model for the relationship between network side variables and user experience variables. Based on the analysis and processing of literature and large amounts of data, the scoring function of each variable is determined. Based on the scores of variables, regression equations of network variables and user experience variables are established. Two user experience variables are determined using the variables and scores given in the data Score function. Since the data distribution of network-side variables is extremely unbalanced and there is no corresponding score data, the score corresponding to the network-side variables is obtained by measuring the single-data fuzzy processing. Using all the known data, the respective total scores of network-side variables and user-experience variables are obtained, and then the functional relationship between the two is derived.

The established model determines the functional relationship between user experience evaluation variables (initial buffering delay and kappa ratio) and network side variables (initial buffering peak rate, end-to-end round-robin time E2E RTT, average download rate during play stage) User experience provides a scientific basis for improving the user experience by improving the factors involved in network-side variables and speeding up the development of web watching.

Keywords: normalized single data fuzzy processing regression equation error analysis isometric sampling user experience optimization

Assumptions:

It is assumed that the initial buffer peak rate, the end-to-end loopback time, and the average download rate during the playback phase of the network side are independent from each other.

It is assumed that the initial buffering delay and the Catatonic proportion of user experience evaluation variables are independent of each other.

Assume the total duration of the play stage is a fixed value of 30000ms.

It is assumed that the code rate in the sample data is a fixed value of 2934 Kbps.

Assuming that the initial buffer score is related to the initial buffer latency, the Caton score is related to the Caton ratio.

According to the large amount of data provided, it is difficult to directly analyze the correlation between

various factors because of the inconsistency of the measurement units for each factor and the inconsistency between the data increase and decrease. Thus, the title of the five variables involved in the data and the video perception rate of the whole process of normalization, the data normalized to the same interval can be clearly analyzed three network side variables, two user experience evaluation variables There is no direct correlation between them, so assume that the three network-side variables are independent of each other and that the two user experience evaluation variables are independent of each other.

By consulting the literature, we know that the VMOS scores reflect the user's subjective opinions and feelings, which are related to video quality, initial buffering delay and kappa ratio, and their scores are calculated based on the video quality score, the initial buffering score and the card Dayton scored. Therefore, drawing on this approach, we seek to establish the scores of the five variables in the essay and establish the functional relationship among the five variables by linear regression based on the scores.

According to provide the initial buffer delay, the corresponding percentage of Caton ratio, so by analyzing the data provided to establish a one-to-one correspondence between variables and scores. After the measurement, using the single data fuzzy processing method, the membership function is established through the triangular distribution, and the relationship between the data and the four grading standards is established (the comment set is set to four, poor, fair, good, very good).

To facilitate the operation and analysis of data, the data into the database, and the use of PHP language for a variety of data operations.

Calculated network-side variables and user experience variables score (see Appendix Figure IV), linear regression analysis in the program to obtain a functional relationship between the two.

Model application and promotion:

In the intelligent mobile terminal watching network video, which is the realization of video on demand in this process, involving client, video server and network transmission link, the main technical support is continuous media in the network transmission, storage and control.

Currently, the two common transport mechanisms are download and video streaming. The video streaming mechanism is different from the download. The client only needs to open up a small buffer, starting from the on-demand to the start of playback. The initial buffer only needs to download an amount of data to achieve a small amount of data relative to the entire video. This short period of time, reflected in the user experience variable is the initial buffer delay, reflected in the network-side variables is the initial buffer peak rate and E2E RTT, you want to get a good user experience, you need to increase the initial buffer peak rate, Reduce E2E RTT. The 5G currently being studied is not only faster than the currently used 4G, but with low latency, which can largely solve this problem. And, the arrival of the 5G era is just around the corner.

For example, the normal playing rate of the client video is greater than the rate at which the video stream reaches the client buffer, that is, the network congestion caused by the uncertainty of the bandwidth allocation of the network may cause the user Caton, which is why the vast majority of users experience poor performance (pure streaming technology has other issues that are not model dependent and therefore not discussed). To solve this problem, you need to increase the average download speed during playback. For the server side, in addition to using high-cost, high-tech hardware facilities, you can also use two-level cache technology. In other words, not only in the client to set the buffer, the server also set a certain buffer, and the buffer has some redundancy, so that the network can make the system adapt to network transmission delay and operating system IO latency Uncertainty ensures stable video playback and reduced catching under complex network loading conditions. And the use of multi-NIC output to address the two-band buffer technology brings the network bandwidth

requirements. Poor client network is also the main reason Caton, which requires hardware and technical support to improve.

In addition to hardware and technology enhancements to improve the user experience, users can watch online video on the client side through APPs provided by various companies. Software development companies can also improve the user experience in the APP by adding small details. Software operators can change the mode of operation, relying on membership fees or user rewards for profits, "beep miles beep" player is to adopt this model, and has been widely praised; you can also seamlessly implanted in the software home page to Instead of embedding ads during play, this formal ad is more easily accepted and accepted.

According to the statistics and consumer surveys of commercial video apps (mobile), most users are watching mobile video below 720 P on the mobile cellular network due to concerns about traffic and tariffs. To improve video quality for a higher user experience, you need to optimize the current video compression algorithms, which also solve many problems from the root.

References:

[1]. Chen Chuxiong, Ke Jiangyi, Qin Daman and so on, screen business experience to assess and optimize the upgrade [J]. Posts and Telecommunications Design Technology, 2017 (2): 17-23.

[2]. Xin Mingying, Liu Feng, Sun Dali, etc., fuzzy controller optimization design (!!) - Triangle membership function optimization study

[3]. Li Jianwei, Feng Chunyan. Intelligent terminal user experience evaluation data processing [J]. Chinese Science Papers Online, 2013 (12): 1-3.

[4]. HUAWEI TECHNOLOGIES CO., LTD. Video Experience Optimization Parameter Description [EB / OL]. [2016-07-20]. Http: //support.huawei.com.

[5]. Zhang Xiaolin, Liao Zhangjun.Research on End-to-End Mobile User Perception Assessment Based on Mobile Internet [J] .New Telecommunication Technology, 2012 (11): 3-5.