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Research into the Constitution and Assessment of the Judging and Scoring System of the Sports Requiring Technique

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Abstract: In this study, the figure skating judging system of the International Skating Union is taken as an example to introduce the judging theories of sports requiring technique and the status quo of the judging system while the networking technology is increasingly improving and the overall profile, the system functions, the service functions of the figure skating judging system in the network environment are assessed and the development tendency of the judging system for the sport requiring technique in the future is predicted so that China's modern sport judging technology may catch up with the international level as soon as possible.

Key words: Software system, hardware system, judge, scoring, analysis

INTRODUCTION

In the modern judging technology, information technology has been widely applied as an important means and measure to improve the modern sport judgment quality. Today, looking back upon the sport development history, the traditional judges of the sports requiring technique use study and calculator to score and the sportsmen's scores can not be fed back to the sportsmen and the coaches, so the traditional scoring means has the disadvantages of lack of trust between them and so on (Harold, 2003). As the modern network technology develops swiftly and the large screen displaying technology is increasingly improving, qualitative change happens to the judging method of the sports requiring technique and the information technology focusing on the multi-media computer and the network communication technology will replace the traditional judging system of the sports requiring technique; significant changes happen to the judging means, thus significantly pushing the development of the judging system (<http://acm.tju.edu.cn>).

ANALYSIS AND DISCUSSION SECTIONS

New judging and scoring system of figure skating of the International Skating Union Since the pair skating gold medal event in Winter Olympics in 2002, the new judging and scoring system of the figure skating of the International Skating Union (ISUCalcFS) has began trial run in the new scoring methods of the International Skating Union of 2003~2004 and was duly put into operation in Turin Winter Olympic Games in 2006 and was firstly used in the figure skating competitions in the Asian Winter Games held in Changchun, China in 2007 which

provides the opportunity for us to study the internationally advanced judging and scoring system so that China's figure skating scoring and calculating method may reach the international level (Figure Skating of China, 2006). The new figure skating judging and scoring system of the International Skating Union is divided into the two parts of the software system and the hardware system, see Fig. 1 for its structure.

The software system of the new figure skating judging system of the International Skating Union: The software system of the new figure skating judging system of the International Skating Union is divided into the event calculation software, the result input software and the audio editing software.

- The figure skating event calculation software of the International Skating Union (ISUCal-cFS)

The figure skating event calculation software of the International Skating Union may run on a touch screen computer or a general computer using standard keyboard and mouse. The software is comprehensive operation software based on database and may input/store all of the information relating to events, calculate the sportsmen's results, print all of the event files, tables, results and result books. The software has the following functions: (1) Inputting/storing/printing sportsmen's personal information, sport information, music information, the coaches' information and the directors' information; (2) Inputting/storing/printing the officials' information and the judges' information; (3) Inputting/storing/printing the event information, the participating countries' information, the participating clubs' information; (4) Drawing lots by the judges and printing the judge groups;

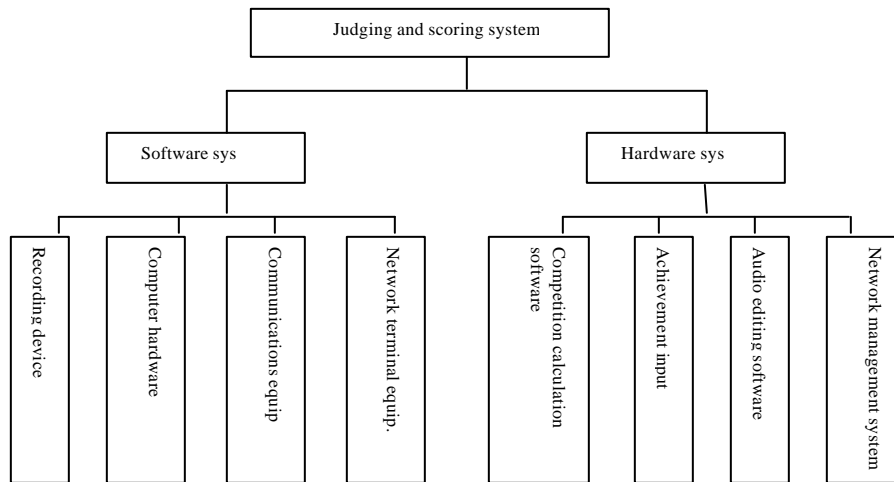


Fig. 1: Constitution of the judging system of the requiring technique sports

(5) Drawing lots by sportsmen before and in the middle of the events, printing the sportsmen’s lineup order; (6) Calculating/printing the competition schedule; (7) Printing the head judge’s, technical supervisor’s, the data operator’s and the judge’s tables; (8) Selectively using the figure skating competition rules of the International Skating Union or using the rules prepared by the associations concerned; (9) Processing the sportsmen’s action grade and scores transmitted through the local area network by the ISUScoreFS software or input by the operators during the competition, automatically calculating the sportsmen’s results and ranking.

- Figure Skating Result Input Software of the International Skating Union (ISUS-coreFS)

The figure skating result input software of the International Skating Union (hereafter abbreviated as “the input software” or ISUScoreFS) may run on a touch screen computer or a general computer using a standard keyboard and mouse and is the input platform for calculation software and may transmit the sportsmen’s technique-involved action grade assessed by the professional group and the scores that all of the judges assign to the sportsmen for the computer software based on the local area network in real time during competition. You may select the “professional group” version or “judge” version of the software which have different interfaces. The software has the following functions: (1) The operation interface of the “professional group” version provides a platform for inputting the descriptions, the grades, the points deducted and bonus points of the sportsmen’s technique-involved actions for

the professional groups; (2) The operation interface of the “professional group” version provides the list of the technique-involved actions that the sportsmen have completed for the professional group; (3) If having the playback function, the operation interface of the “professional group” version provides the function of video playback of the selected actions or the whole program of the sportsmen upon the completion of the sportsmen’s performance; (4) The operation interface of the “judge” version provides a platform for inputting the sportsmen’s technique-involved action GOE, program score and points deducted; (5) The operation interface of the “judge” version, if with the playback function, provides the video playback function of the sportsmen’s selected actions in real time for the head judge and the judges.

- The video editing software of figure skating of the International Skating Union (ISU-CutterFS)

The video editing software of figure skating of the International Skating Union (hereafter abbreviated as the “editing software” or ISUCutterFS) may run on a touch screen computer or a general computer using a standard keyboard and mouse. The software has the functions of video acquisition, editing and playback in the new judging system. The computer with this software may be connected with cameras and the professional group computers and judge computers that are installed with input software to achieve the functions of image acquisition, editing and playback inside the entire new judging system. The software has the following main functions: (1) Collecting the sportsmen’s video in games;

(2) Editing the sportsmen's actions in games; (3) Playback of the technique-involved action and the entire programs edited for the professional group; (4) Providing playback of technique-involved actions for the head judge and the judges.

The video transmission solution that ISU adopts is as follows: analog signal is used for collecting and transmitting images; before the video signal enters each computer in the system, the analog-to-digital converter converts the analog signal into the digital signal for computer's processing. In the solution, ISU uses the cameras that use analog signal output to convert single-way inputting of the analog signal into multiple-way outputting through signal distributors. The number of signals output depends on the number of the computers needing the video signals. All of the computers needing the video signals use independent analog signal lines to connect with the video distributor to get the whole program video of the sportsmen and store it on the hard disc temporarily until the sportsmen's results are confirmed by the result calculation system. The video editing computer is to read the beginning and completion time of each technique-involved action from the video editing computer through the data network and is associated with the sportsmen's program video files that the computer records. When the computer users need to play back a technique-involved action, the computer will play back the video sections of the time range specified by the video editing computer (No. 1305 Notice of the International Skating Union) (ISU, 2005).

The hardware system of the new judging system

Intercom system: You may opt to equip the system with the internal intercom system and upgrade it into the "primary-level intercom system", the "medium intercom system" and the "senior intercom system" which correspond to the configurations of Level 1A, Level 2A, Level 3A systems of the International Skating Union respectively. The requirements for computer equipment are completely the same with those of the corresponding "primary-level intercom system", "medium intercom system" and "senior intercom system". Just full duplex wired earphone intercom (teleconference equipment) is needed and its number depends on the system requirements (Wang and Yao, 2006).

Operation requirements of the hardware of the judging system:

- Configurations of the result calculation computer required (portable or desktop): CPU: at least Intel Pentium IV; Microsoft Windows XP; at least 1G of memory; at least 2GB free hardware space; colorful display; True-color display and 1024×768 display

card; CD-ROM drive; network adapter of 100 Mb; at least four USB interfaces; standard keyboard and optical mouse

- Configuration of result calculation printer required: Non-color laser printer with USB interface
- The head judge, technical supervisor, technical expert, judge, data input computer configuration required (portable or desktop): CPU at least Intel Pentium IV with the operation speed of more than 2G; AMD processor with the operation speed of more than 1G; Microsoft Windows XP; at least 512 Mb of memory; at least 40GB free hardware space; colorful display; True-color display and 1024×768 display card (with DirectX9); CD-ROM drive; network adapter of 100Mb; IEEE1394 interface (provided by the mainboard or PC card); USB interfaces; standard keyboard and optical mouse (Yu, 2004)
- Video editing computer configuration required (portable or desktop): CPU at least: Intel Pentium IV with the operation speed of more than 2G; AMD processor with the operation speed of more than 2G; Microsoft Windows XP; at least 256 Mb of memory; at least 20GB free hardware space in the format of NTFS; colorful display; True-color displaying and 1024×768 display card (with DirectX9); CD-ROM drive; network adapter of 100Mb; IEEE1394 interface (provided by the mainboard or PC card); USB interfaces; standard keyboard and optical mouse
- Camera configuration required: Household DV camera that may provide IEEE1394 output and the quasi-pro or pro cameras with IEEE1394 output may bring better effects (Zhang, 2002)

CONCLUSIONS

Held more and more and larger and larger international events in recent years, however, very few judging methods and means are adopted for the sports requiring technique and there is still a big gap in this between China and the world developed countries. Reform of the judging method and calculation method of the new judging system is a revolution in the history of the judging rules. Seen from the development tendency in the future, the new judging system is more and more widely applied and plays an increasing role and will be very important in the development of the diversified athletic sport judging system for its great functions and flexible organization forms.

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