Personal Multi-angle Media Broadcasting Service System

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Abstract—In this paper, we propose a personal multi-angle media broadcasting service system. The proposed system accepts multiple input streams from the internet, files, and live broadcasts, and provides a personal media broadcast stream for clients. A personal media producer program and client programs of the proposed system are implemented on various platforms. The implemented system is experimented on a real sports event for a live broadcast of multi-angle media.

I. INTRODUCTION

Recently, multimedia services based on social network service, like a social TV, personalized multimedia services, and personal broadcasting services are being developed. Social TVs provide co-experience environments using VOD or live video with social network services. However, personalized contents are not supported on social TVs. Personal broadcasting services provide personal contents generation and personal broadcasting channel. Therefore, users can share their experiences with them. However, they do not support TVs which are traditional multimedia display, and real-time produced contents. Since personal broadcasting services cannot support multiple contents or multi-angle media, only pre-generated contents and legacy media like TV shows or movies are supported.

In this paper, a personal media broadcasting service system based on multi-angle is proposed. The proposed system can accept multiple sources, multiple kinds of contents, and multi-angle contents, and can support real-time user generating contents and broadcasting service.

II. SYSTEM OVERVIEW

In this paper, a personal multi-angle media broadcasting service system is proposed for personal media broadcasting based on multi-angle and multi-view media contents. Fig. 1 shows a concept of the proposed system. The proposed system consists of a personal media broadcaster, named media jockey (MJ), and client applications. The MJ uses various multiple sources from stored media at hard disk drive, streamed media from broadcasting stations or the internet. Users of the MJ are able to produce and broadcast their unique, interesting, and personal media from various multiple sources. Furthermore, users with the MJ provide their personal media to clients using client applications based on IPTVs, smart TVs, smart phones, tablet PCs, desktops, or laptops.

A. Media Jockey

Fig. 2 describes architecture of the MJ software. As shown as Fig. 2, the MJ consists of five modules. The first module is a buffering module, another one is a decoding module, the third one is a streaming module, the fourth one is a client manager module, and the other one is a user interface module.

The buffering module creates and manages buffers for media sources. Media sources can be streams from internet, file stream from local storages, or broadcast media from television stations.

The buffering module can handle media sources, and provides single abstracted interface to other modules. Each of streams has a buffer on this module. The buffering module stores each media stream to corresponding buffer.

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The decoding module reads media streams from buffer of the buffering module, and decodes them on real-time. This module has threads to decode for each media stream. The decoding module controls decoding threads according to control messages from the user interface module, and forwards the messages to the buffering module.

The user interface module displays decoded streams received from the decoding module, provides user interface to users for producing personal media, and collects user’s commands. Furthermore, this module controls input streams and an output stream using control messages, and provides chatting service between MJ user and client users.

The streaming module provides streaming personal media to clients using received stream from the buffering module on real-time. Using client information received from the client manager module, the streaming module services adaptive media stream to all connected users. This module is able to add varied streaming methods such as peer-to-peer streaming, RTP and so on.

The client manager module controls admission of clients, manages clients. Also this module provides user information to the user interface module and the streaming module.

B. Multi-Angle Clients

Fig. 3 shows architecture of client program. The client program consists of a buffering module, a decoding module, and a user interface module. The buffering module receives a personal media stream from the MJ, and stores into a buffer for stable playback. Stored media stream in the buffer is sent to the decoding module. The decoding module decodes media stream sent by the buffering module, and sends decoded media data to the user interface module. The user interface module displays media on screen of client device.

III. EXPERIMENTAL RESULTS

The implemented MJ and clients are experimented on the last Korean Series game of Korean Baseball Organization at October 19, 2010. Two MJs with 5 clients for each are used for the experiment. Three multi-angle cameras and one stream from broadcast station are applied for input streams of each MJ. The MJ can select output stream among four input streams, and streams out for connected clients. Fig. 4 shows screenshots of the implemented MJ program for the experiment. The first picture of Fig. 4 is intro screen of program. Left upper pictures of each screenshots represent output stream, and bottom pictures of each screenshots show four input streams. When a MJ user clicks one input stream among four input streams, the output stream is changed to the clicked input stream on real-time. Fig. 5 and 6 show snapshots of client applications for a smart TV and a smart phone, respectively.

IV. CONCLUSION

In this paper, the personal multi-angle media broadcasting service system was proposed to provide user generating contents and broadcasts. The proposed system provides a personal producing and broadcasting program, named media jockey (MJ), and client application. The MJ are running on Windows with multiple source, multiple contents, and multi-angle contents on same time and real time. The MJ supports user producing environments, the personal broadcast feature, and chatting feature with viewers. Client applications are able to execute on the Android platform for smart TVs and smart phones and Windows for PCs and laptops.

REFERENCES