

Mobile Multimedia System

--- Providing Customized Sports Video to Mobile Device

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Outline

§ Introduction of the System

§ Sports Video Analysis

§ Video Streaming Coding

§ User-Interface Design

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Introduction

§ Why Do this Research?

- There are wide viewership, at less tens of millions sports video audiences in China.
- There are more than 25.7 millions users of smart mobile device in China.
- There are too many issues for research

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Introduction

§ What Is the Key Issues?

- Limited bandwidth
- Limited display
- Limited computation
- Limited power
-

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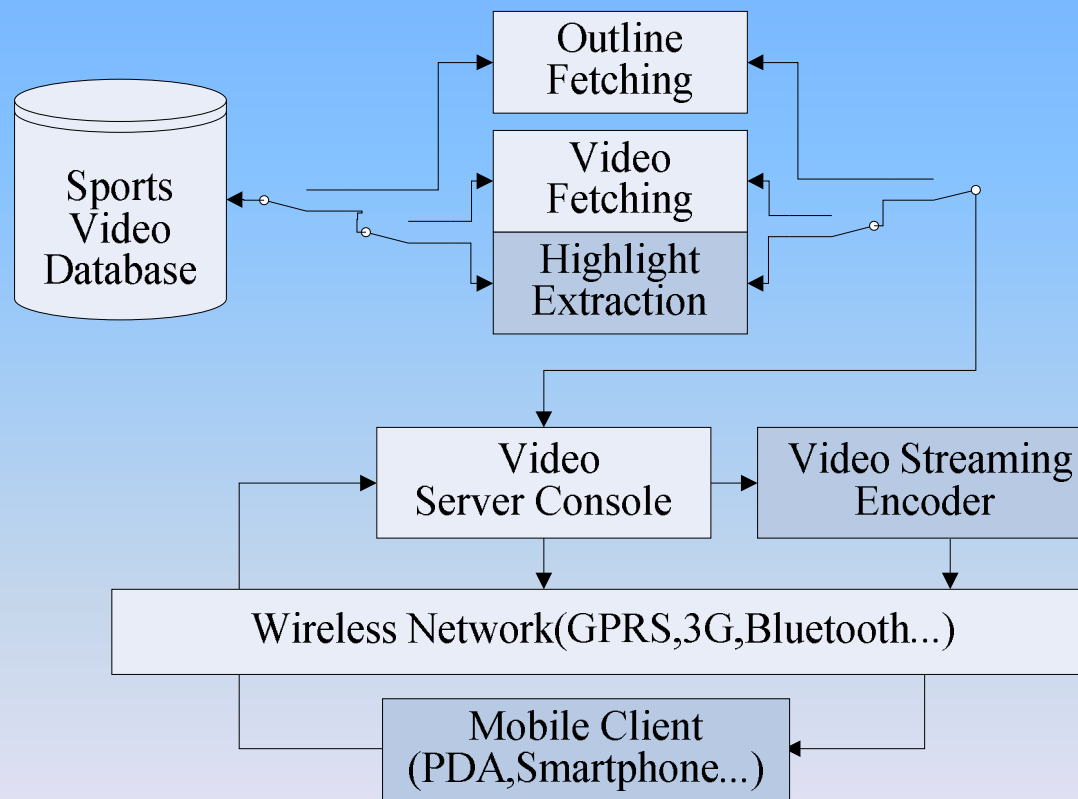


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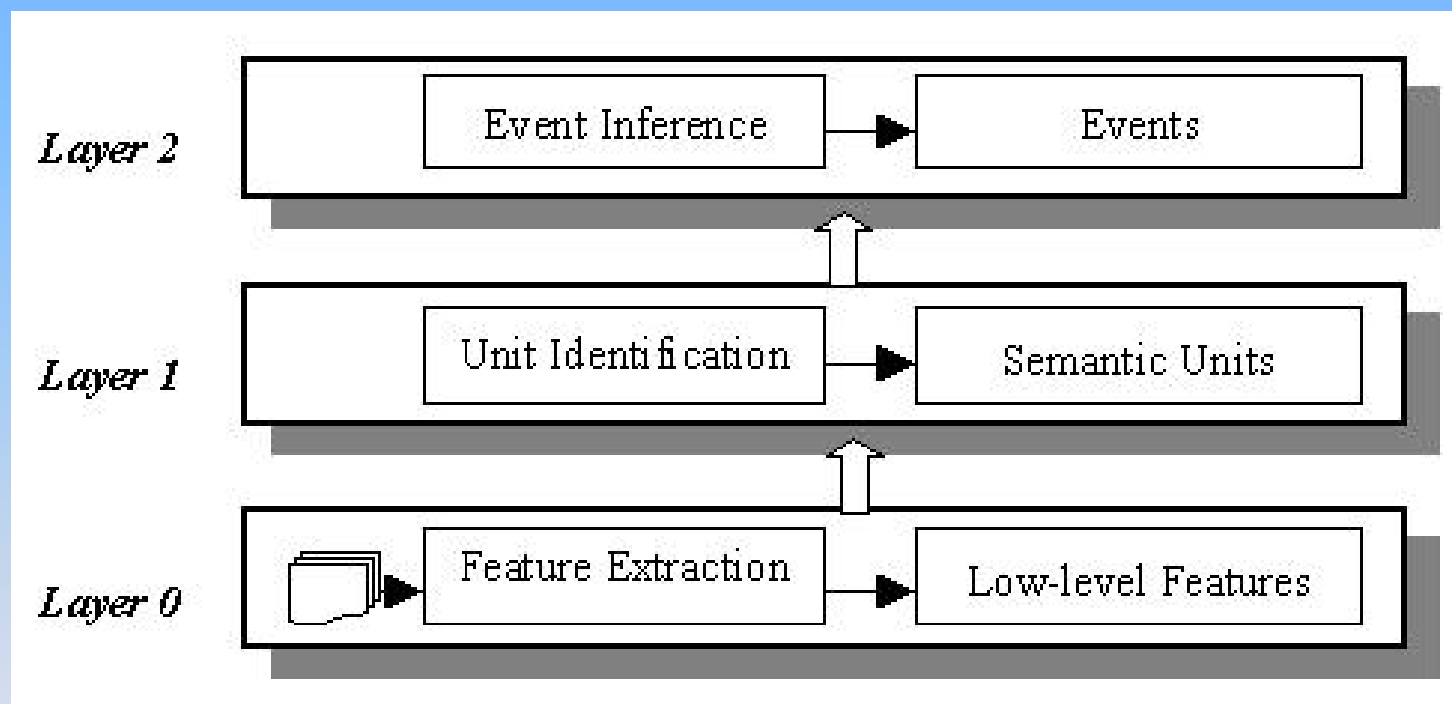
Introduction

§ The System Structure



Sports Video Analysis

§ Highlight Extraction



Sports Video Analysis

§ Low-level Features

- Domain Color
- Texture
- Motion
- Audio
-

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Sports Video Analysis

§ Mid-level Semantic Shots



long field-view



goal view



goal-net



audience



player medium motion



player medium still



player close-up



referee close-up



goalkeeper close-up



coach close-up



replay



caption

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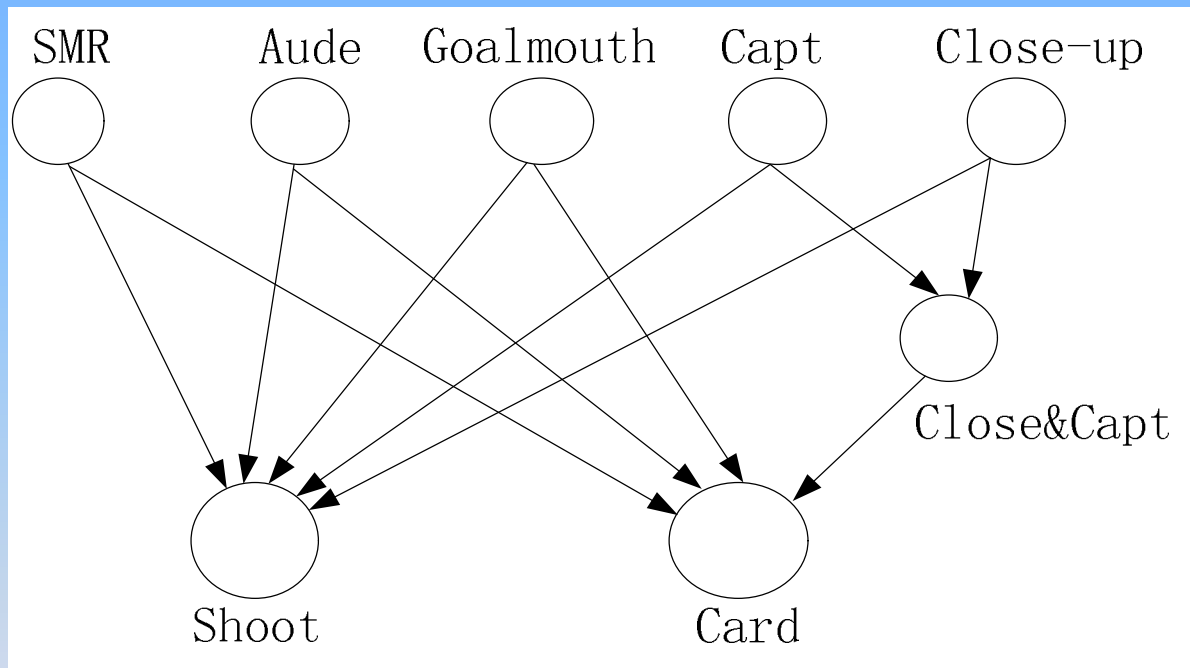


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Sports Video Analysis

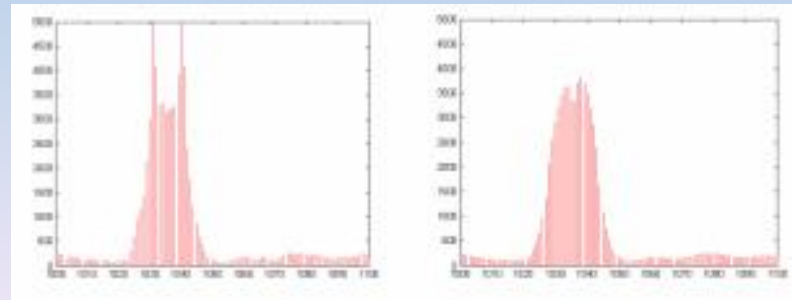
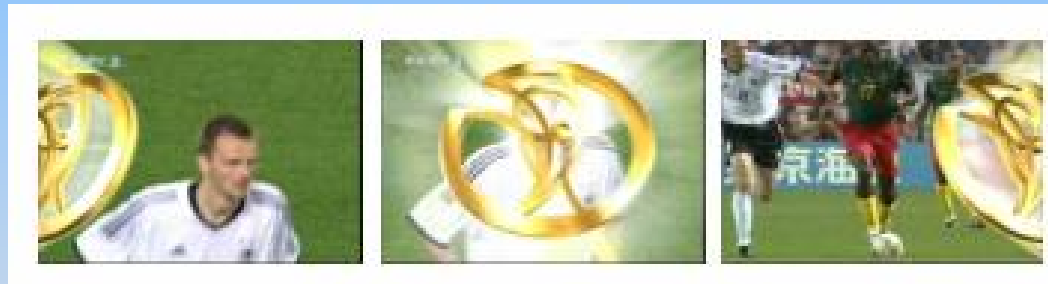
§ Highlights Inference



Sports Video Analysis

§ Based on Replay Detection

- Logo transition detection
- Logo template matching
- Replay identification based on SVM



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Video Streaming Coding

§ **Based AVS Encoder (WM3)**

§ **Two improvements**

§ **Variable-Period Intra-Frame Selection Based on Shot Detection**

§ **Attention Region Coding**

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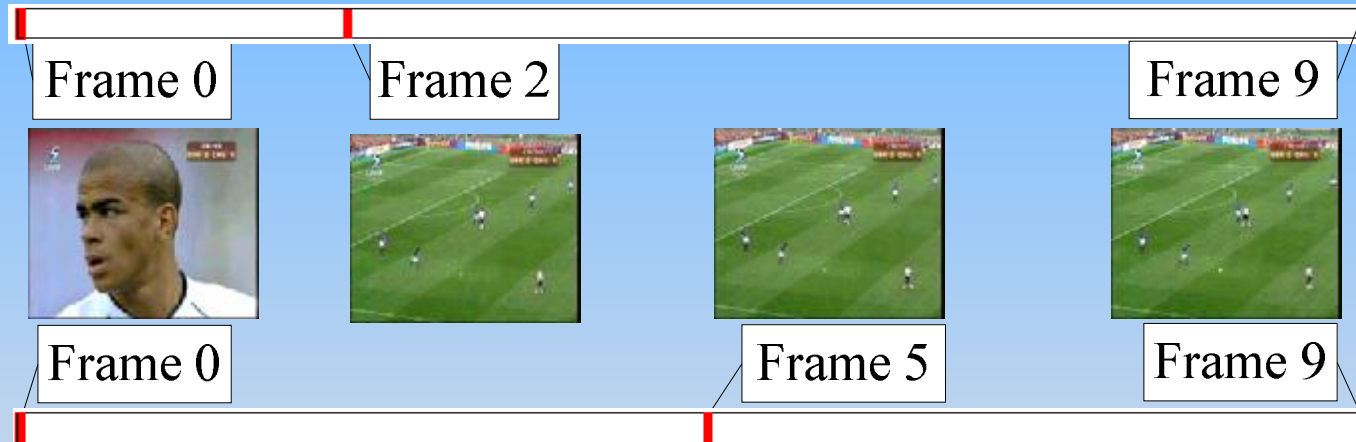


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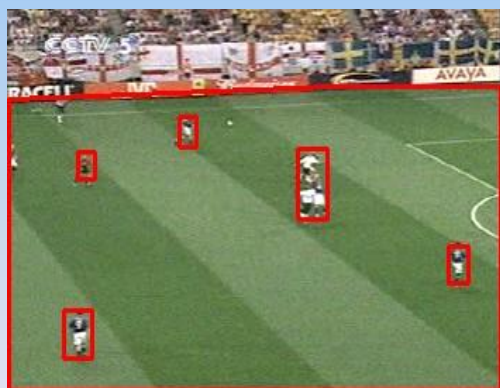
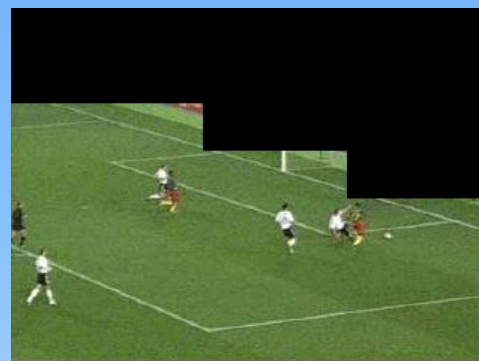
Video Streaming Coding

§ Variable-Period Intra-Frame Selection Based on Shot Detection



Video Streaming Coding

§ Attention Region Coding



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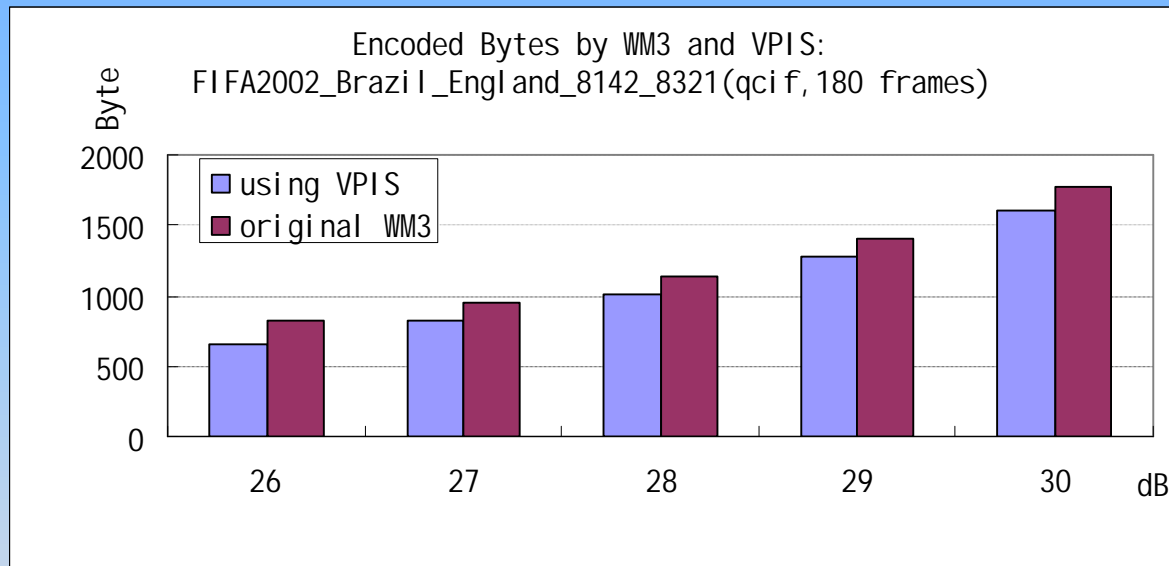


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Video Streaming Coding

§ Experimental Results



Optimized by VPIS (Variable-Period Intra-frame Selection)

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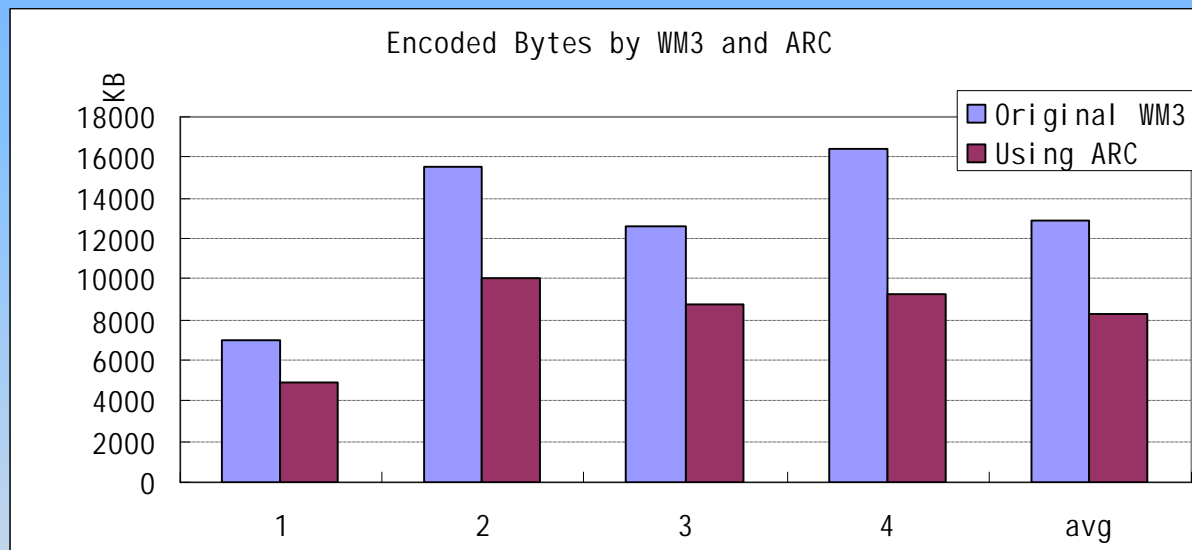


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Video Streaming Coding

§ Experimental Results



Optimized by ARC (Attention Region Coding)

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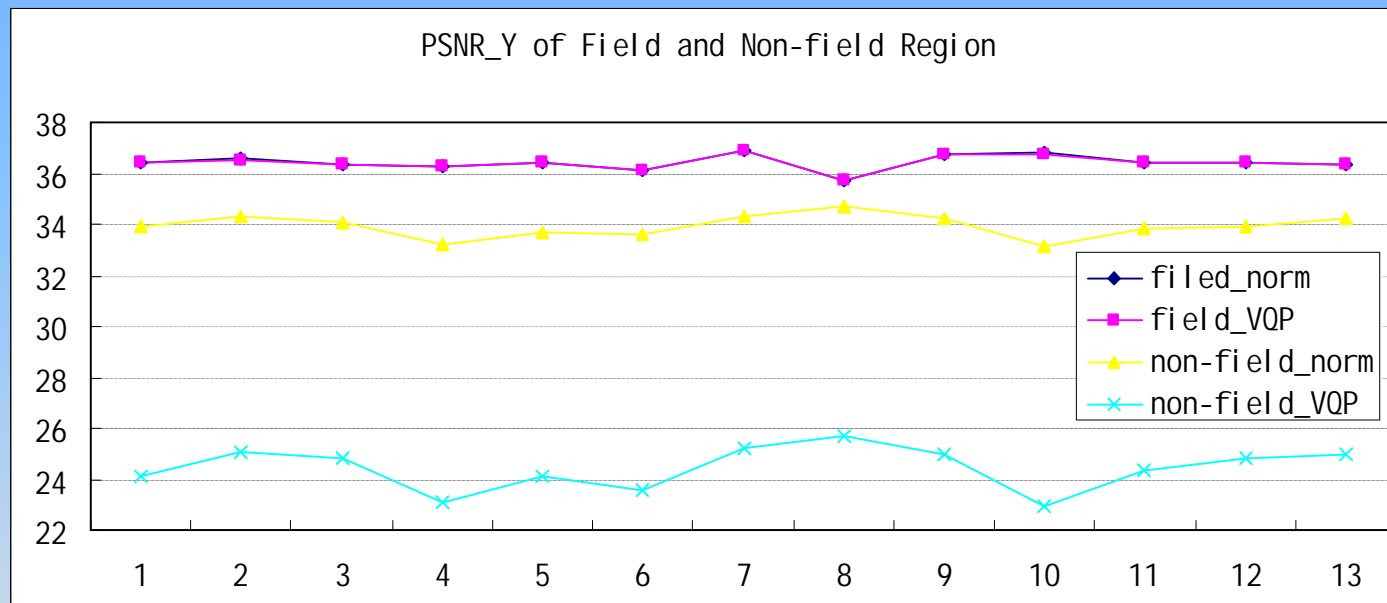


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Video Streaming Coding

§ Experimental Results



PSNR of attention and non-attention region

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Wireless Transmission

§ Protocol

- **Blue-tooth**
- GPRS
- 3G

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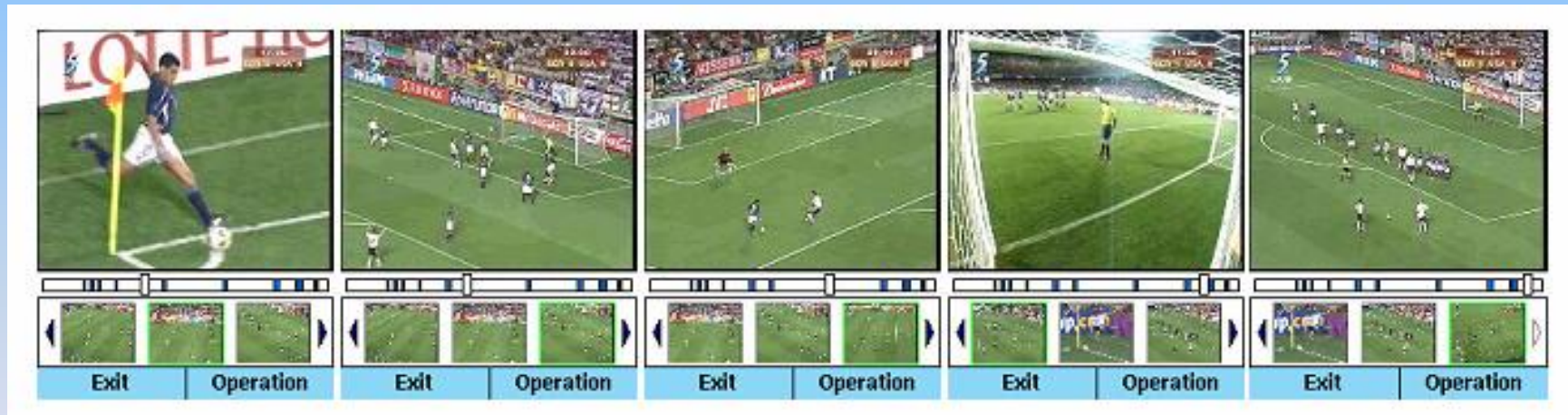
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User-Interface Design

§ Browser Design

- Video play panel
- Progress bar
- Highlight overview panel



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Thank You

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