VideoSum: A Video Storing, Processing and Summarization Platform

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Introduction

- ► We present **VideoSum**, a video storing, processing and summarization tool.
- VideoSum can process edited and unedited video originating from different categories such as movies, news, documentaries, series, reportage, shows and home videos.
- VideoSum provides the following functionalities:
- Editing audiovisual data and creating summaries that reduce the data volume and processing time accordingly.
- ▷ Text-based **search** in digital libraries.
- > Automatic and efficient **indexing** of audiovisual data.

MainWindow			
File Actions Options Configuration Help			
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VIDEO TYPE	METADATA	SUMMARY REPRESENTATIONS	LEVEL
UNEDITED	VIEW ALL INFO	● Lines	
 Documentary 	INSERT METADATA	O Filmstrip	Shot
 Reportage 		 Montage 	
O Other	RESET ALL INFO	 Similar Shots 	○ Scene
EDITED		 Video 	
 Documentary 		 Faces 	 Chapter
		 Camera Movements 	
 Reportage 		o camera wovements	
ReportageNews			SUMMARY
	WELCOME	DISPLAY	SUMMARY
 News 	то	DISPLAY	
NewsMovies		DISPLAY	
NewsMoviesShows	то	DISPLAY	
 News Movies Shows Series 	то	OUT ✓ Video - Static Based ■ Video - Segment Based	
 News Movies Shows Series Other 	то	OUT	
 News Movies Shows Series Other OPTIONAL MODULES Camera Movements 	то	OUT	
 News Movies Shows Series Other OPTIONAL MODULES 	то	DISPLAY	

Summary Representations

- The major contribution of VideoSum application is the ability to produce several types of video summary and offers the following representations:
- **Lines**: Keyframes per shot at any level (shot/scene/chapter).
- **Filmstrip**: All the video keyframes in a filmstrip.
- Video: The user can watch simultaneously the initial video and the summary created from the application.
- Similar shots: In case of unedited video, groups of similar shots are represented from a single shot.
- **Faces**: Only the keyframes that contain face are available to the user.
- Camera Movements: All camera movements detected in the video, followed by their characterization as pan/tilt/zoom.

Summary Outputs

Export summary in any of the following types:

- Video of Static Frames
- Video of Segments
-

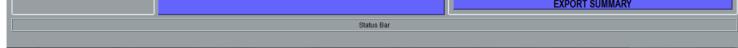


Figure: Main Window of VideoSum Application.

System Architecture

The main features/contributions of this system are:

- Video Segmentation: Segmentation can be applied in three levels ranging from the finest shot level, the intermediate scene level and the coarse chapter level.
- Video Summarization: Efficient summarization algorithms can provide different summarizations of the video content in any level.
- Video Representation: Different visual representations of the video's summary are available to the user.
- Video Storage: Storage of different summary types, such as video, images, xml and html.

Basic Functions

The system is **fully automated**, processing several actions with respect to the video type. System parameters can be adjusted to fit the user's preferences. The basic actions of the system are:

- Shot Boundary Detection
- Unwanted Shots/Frames Removal
- Shot Representation/Summarization
- Detection of Sequences of Similar Shots
- Scene/Chapter segmentation
- News Detection
- Camera Movements detection

- Html file
- Xml file
- Montage Frames
- Keyframe Images
- News Video Summary (Only anchorman)

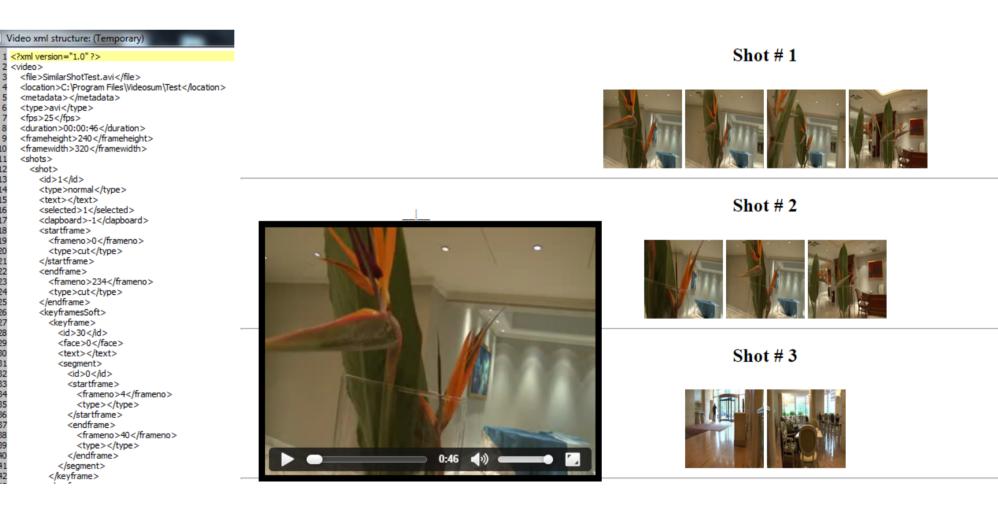


Figure: Summary Outputs - Xml & Html.

Annotation & Search

- ► Insert annotation at any level.
- Search keywords and view results in all levels.
- ► Video
- Shot
- Keyframe

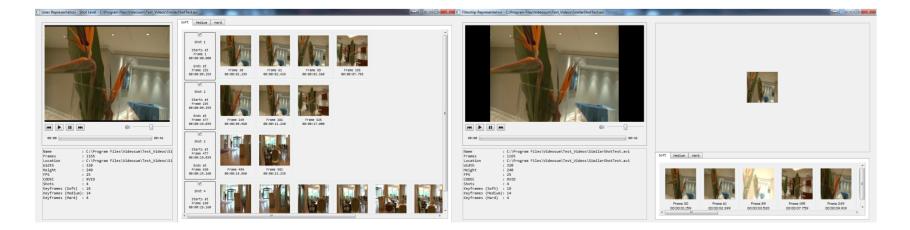


Figure: Summary Representations - Lines & Filmstrip.



Figure: Summary Representations - Montage.

Implementation

The VideoSum application is based on **OpenCV library** for internal representation of video frames and on **QT library** for designing the user interface.

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