

# Media Query

## Multimedia System Design

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# Overview

- 1 Color based query
- 2 Texture based query
- 3 Audio based query
- 4 Motion based query

## Histogram generation

- Individual histogram for each Red, Green and Blue color components
- Key frame extraction - based on Directed divergence and Cumulative directed divergence

$$F(p, q) = A \int q(x) \log \frac{q(x)}{p(x)} dx + B \int p(x) \log \frac{p(x)}{q(x)} dx \quad (1)$$

- Matching - based on Hausdorff distance

$$D(S, R) = \max[\min_{r \in R}\{d(s_1, r)\}, \min_{r \in R}\{d(s_2, r)\}, \dots, \min_{r \in R}\{d(s_n, r)\}] \quad (2)$$

# Key frame



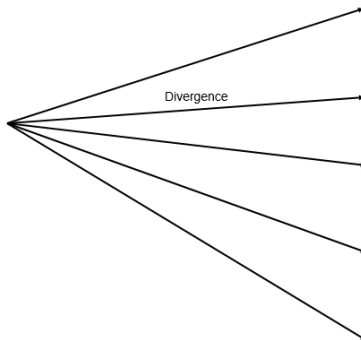
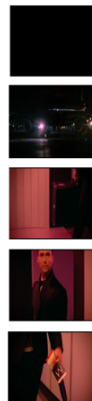
**Key Frame**

# Matching illustration

Query video key frames



Key frames from training data



# Texture based query

## Local Binary Pattern

- Texture based feature extractor developed in 1994
- Used in it's simplest form

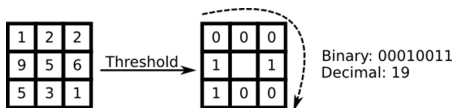


Figure: LBP generation

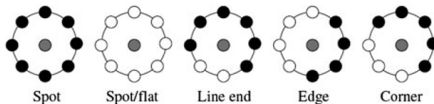


Figure: Different LBP patterns

## Power Spectrum

- Fourier transform on audio samples
- Window size of 4096 samples
- Averaging 10 windows to form a audio frame - approximately 0.5 secs of audio
- Matching based on Euclidean distance

# Motion based query

## Motion History Histogram

- Quantity of motion is defined for 30 frames - 1 second
- Motion pattern of 0111110 is the metric implemented
- The metric pattern indicates motion present continuously in 5 frames

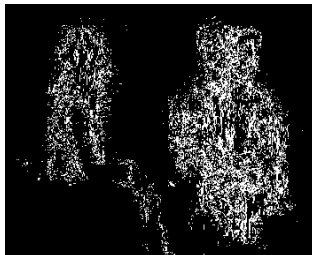


Figure: Motion History Histogram output for interview video



- Hongying Meng; Romera-Paredes, B.; Bianchi-Berthouze, N., "Emotion recognition by two view SVM`2K classifier on dynamic facial expression features," Automatic Face & Gesture Recognition and Workshops (FG 2011), 2011 IEEE International Conference on , vol., no., pp.854,859, 21-25 March 2011
- Sang Hyun Kim; Rae-Hong Park, "An efficient algorithm for video sequence matching using the modified Hausdorff distance and the directed divergence," Circuits and Systems for Video Technology, IEEE Transactions on , vol.12, no.7, pp.592,596, Jul 2002
- Image source - Google
- [stackoverflow.com](#)

# Questions?