AI Based Content Analyzer (ABCA)

for IPTV / Cable Tv / OTT headend.

Manoj Kumar Manmathan
The Initiator

Feature List:
AI Based Content Analyzer

01 **Video Blanks Detection**

Exploration of the digital signal processing methodology used for detecting video blanks , including accuracy and results.

02 **Video Freeze Detection**

Exploration of the digital signal processing methodology used for detecting video freezes, including accuracy and results.

03 **Video Macro Blocks / Pixelization Identification**

Utilization of a deep learning approach (CNN) for identifying video macro blocks and pixelization.

04 **Audio Level Detection**

Audio low, high, loss detection.

05 **Live Logo Detection**

Identify which channels are carrying the Live contents.

06 **Channel Logo Change Detection**

Logo change detection : a rearely useful feature.

07 **Scene Detection**

Check for which sports / events in which channel.

08 **Conclusion**

List of already Tested functionalities & need to test functionalities.
Future enhancements.

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Video Blanks Detection

Digital Signal Processing Methodology and Accuracy

Digital Signal Processing Techniques

Python based Digital signal processing techniques employed for detecting video blanks.

High Accuracy Level

Successfully executed with 99% accuracy, highlighting the reliability of the detection process.

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Video Freeze Detection

Digital Signal Processing Methodology and Accuracy

Digital Signal Processing Techniques

Python based Digital signal processing techniques employed for detecting video freezes.

High Accuracy Level

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Video Macro Blocks / Pixelization Identification

Deep Learning Approach (CNN)

Convolutional Neural Network (CNN) Architecture

Simple DL model : CNN architecture used for detection.

Accuracy Metrics

Expecting 60 accuracy with minimal resource (CPU, memory) and minimal dataset.

Good Starting Point

Not tested.

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Audio Level Detection

Digital Signal Processing Techniques

Audio Level Analysis Methods

DSP is used to analyze audio levels, categorizing them as low, silence, or high.

Achievements in Accuracy

Good accuracy for POC.

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Live caption Detection

Useful to identify Live events / matches

Methodology Overview

Possible:
1. OCR + CNN combination works effectively
2. EasyOCR or Tesseract for text recognition

Current Status

Not tested yet

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Logo Change Detection

Rare use.

Implementation Approaches

1. CNN could be highly effective for logo detection since logos have distinct features and patterns
2. Transfer learning with pre-trained models like ResNet or VGG16 works great

Current Status and Testing

Not tested

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Scene Detection Techniques

Identify which sports happening in which channel

Overview of Techniques

Possible: CNN and Yololite can be utilized for scene detection.

01

Potential Applications

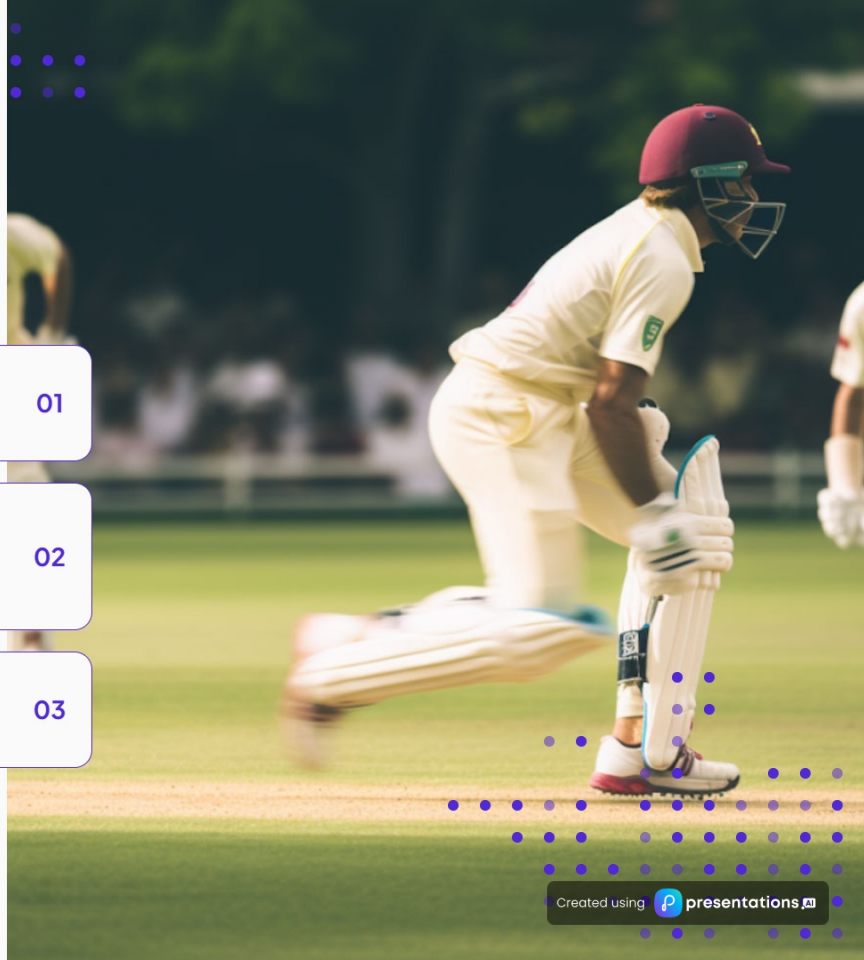
Content segmentation : which channels carry cricket or football, now.

02

Current Status and Testing

Not tested yet; future applications remain promising.

03



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Conclusion and Future Directions

Key Findings and Future Research

01

Summary of Key Findings

1. Succesfully implemented video blanks, freeze, audio analyzers using DSP for h264 streams.
2. Macroblock analyzer, NOT tested but expecting accuracy with CNN out of the box and with limited dataset is 60%.
3. Live caption detection and logo change detection are theoritically feasible as many Models are available.

02

h264 vs h265

Succefully tested on h264 & other formats.

03

Hardware requirements

Need to figure out for live channels. Works on filesystems on laptop.

04

Areas for Further Research

Explore cutting-edge optimization techniques to enhance system efficiency

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