An automated framework for advertisement detection and removal from sports videos using audio-visual cues

Abeer TOHEED, Ali JAVED, Aun IRTAZA, Hassan DAWOOD, Hussain DAWOOD, Ahmed S. ALFAKEEH

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Problems & Ideas

- Advertisement detection and removal from sports videos
  - Manual advertisement detection is laborious activity
  - Advertisements require more bandwidth for transmission and storage
- Ideas: Automated advertisement detection and removal from sports videos
  - Shot boundary detection using AlexNet framework
  - Creation of video shots based on detected boundaries
  - 26-D MFCC-GTCC feature extraction corresponding to video shot
  - Classification of extracted feature vector using weighted-KNN into sports or advertisement shot

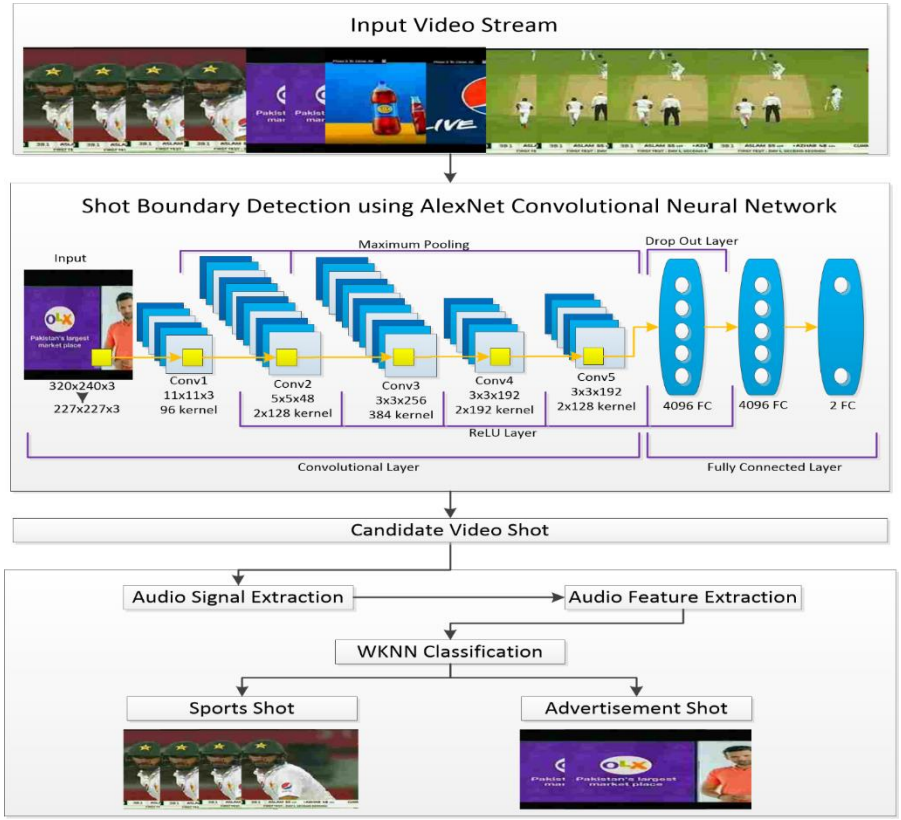

Figure 1: Proposed Framework

Main Contributions

- Effective advertisement detection framework using audio-visual features.
- Our deep learning-based shot boundary detection is robust to aforementioned limitations i.e. variations in camera, position, image and template sizes, etc.
- Our audio-stream analysis-based advertisements detection method effectively captures the attributes of musical and speech tones through robust spectral features that can reliably be used to classify the advertisement and game shots.

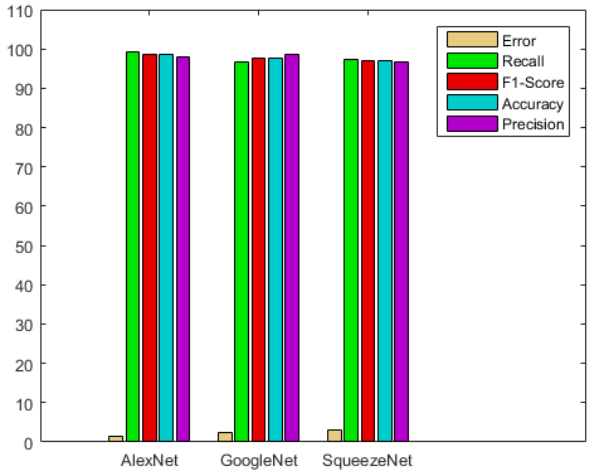

Fig-2:Comparison of deep neural networks

Conclusion

- AlexNet perform better than GoogleNet and SqueezeNetv(Fig-2)
- Fusion of MFCC-GTCC outperforms MFCC and GTCC performance(Fig-3)
- Two-step Advertisement detection provide efficient results(Fig-4)

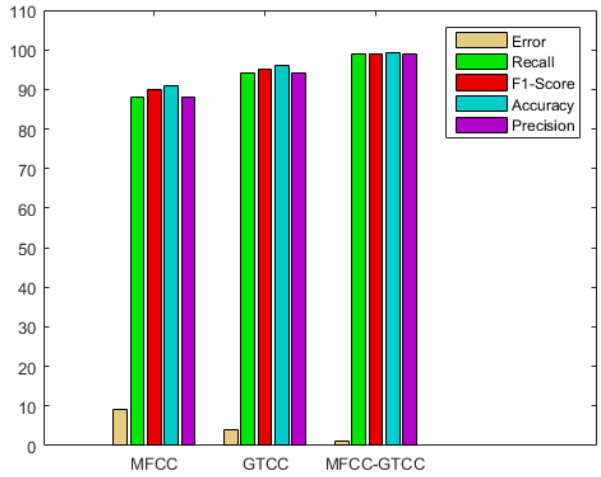

Fig-3:Comparison of audio features

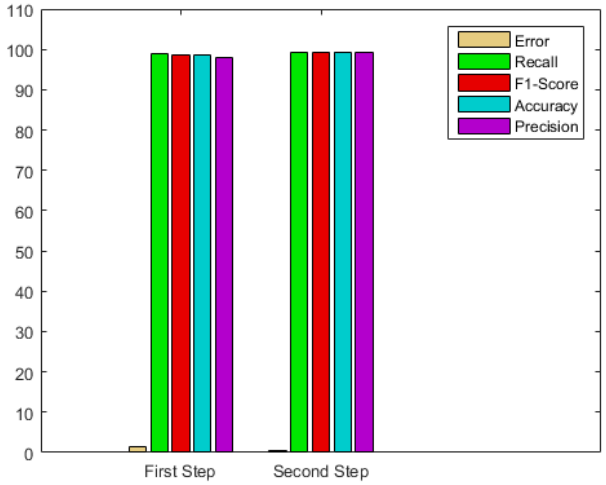

Fig-4:Comparison of step-wise results