

Dancer Identification within Detected Shot Boundaries

Kedar Reddy

Department of Visual Arts
University of California San Diego
San Diego, CA 92122
kreddy@ucsd.edu

Nevin Gaudreau

Department of Computer Science
University of California San Diego
San Diego, CA 92122
ngaudrea@ucsd.edu

Nishanth Satyanarayana

Department of Electrical Engineering
University of California San Diego
San Diego, CA 92122
nsatyana@ucsd.edu

Abstract

The purpose of this project will be to categorize identities and attributes of dancers and their surroundings from song-dance sequences of Telugu movies based on various image processing techniques. The data set will consist of over sixty song-dance sequences from the last four decades of Telugu Cinema, two sequences from ten movies each decade. Methods that compute values such as amount of local movement and color information between frames, and track objects over time will be used. The research will facilitate a better understanding of the culturally influential song-dance sequences that define popular Indian Cinema, providing critics and commentators scientific methods and evidence to arrive at their claims.

1 Qualifications

Kedar: I have taken CSE 12, a course on basic data structures, and CSE 166, the image processing class taught by Serge Belongie. I am familiar with coding in Java, C, C++, ActionScript 3.0, J2ME, Python, and MATLAB. I have conducted research with Telugu Cinema before at Calit2 at UCSD over the Summer.

Nishanth: I have taken CSE 12, ECE 161a, ECE 30, ECE 101, which are courses in basic data structures, digital signal processing, computer engineering, linear system fundamentals. I am proficient in Java, C, C++, MIPS Assembly, and MATLAB. I have extensive experience with signal processing using MATLAB and LabVIEW.

Nevin I have taken CSE 12, CSE 100, CSE 30, CSE 70, CSE 130, CSE132, CSE 166, which are classes in basic and advanced data structures, databases, and image processing. I am comfortable with coding in Java, C, C++, Python, SQL, Prolog, OCaml, SPARC Assembly, and MATLAB. I have experience with working in groups, especially in the role of the coder.

2 Milestones

Week2: We'll be learning openCV and Motion2D and implementing simple algorithms in them related to the project. Read and understand the related papers.

Week5: Modify existing code from SVEN so it works with video input. We will try to detect shot boundaries using methods described by Jordi Mas and Gabriel Fernandez¹ and Klaser²: based on color histogram differences.

Week8: Write OpenCV program that utilizes algorithms found in Perez and Laptev³ to recognize and differentiate dancer identities. We will also be using methods outlined by Klaser² and Laptev⁵ to assist in the better dancer identification.

Week9: Finish program and test extensively with training data set.

Week10: Finish testing the software with the test data set. Finish final paper and final presentation.

3 Division of Labor

Kedar and Nevin: We are going to work on getting SVEN to work with video input rather than live camera input. We also will be responsible for data gathering and organization.

Nevin and Nishanth: We will be working on body detection and segmentation based on color histograms as specified by Laptev⁵.

Nishanth and Kedar: We will be working on analyzing the segmented body motions. We will also be working on color recognition and color changes of the body segments as illustrated by Laptev, Klaser, Schmid, Ullah, and Wang⁶.

4 Questions to be Answered

Does a direct correlation exist between color of dancer attire and their role in the music video, lead dancer/main dancer?

How do shot boundaries assist in better dancer detection?

What role does position of actors in the frame tell us about their role in the dance?

To what degree of accuracy can we recognize dancer identities with our finished prototype?

5 Software

SVEN

Motion2D

MATLAB

6 Dataset

Telugu Cinema Song-Dance Sequences over the last four decades-post 1970. We possess a huge library of Telugu cinema from where we can obtain the song-dance sequences.

References

[1] J. Mas, G. Fernandez. (2003) "Video Shot Boundary Detection Based on Color Histogram" Digital Television Center (CeTVD) La Salle School of Engineering, Ramon Llull University. Barcelona, Spain.

- [2] A. Kläser. (2007) "Human Detection and Character Recognition in TV-Style Movies"
Informatiktage. pp 151-154
- [3] I. Laptev and P. Pérez. (2007) "Retrieving actions in movies"
Proc. ICCV'07, Rio de Janeiro, Brazil.
- [4] S. Zanetti, L. Zelnik-Manor, P. Perona. (2008) "A walk through the web's video clips"
First IEEE Workshop on Internet Vision, in Computer Vision and Pattern Recognition (CVPR08)
- [5] I. Laptev. (2009) "Improving Object Detection with Boosted Histograms"
Image and Vision Computing, vol. 27, issue 5, pp. 535-544
- [6] H. Wang, M. M. Ullah, A. Kläser, I. Laptev and C. Schmid. (2009) "Evaluation of local spatio-temporal features for action recognition" *Proc. BMVC'09*, London, UK.