International Journal of Science and Research (IJSR)
ISSN (Online): 2319-7064
Index Copernicus Value (2015): 78.96 | Impact Factor (2015): 6.391

Robust Face-Name Graph Matching for Movie Character Identification

Jonnadula Narasimha[1], S Nishanth Kumar[2], Chiluka Shiva Kumar[3], D Vamshi Krishna Rao[4]

[1]Associate Professor, Department of Computer Science and Engineering, CMR Technical Campus, Medchal, Hyderabad, Telangana, India

[2, 3, 4]Department of Computer Science and Engineering, CMR Technical Campus, Medchal, Hyderabad, Telangana, India

Abstract: ***Automatic face identification of characters in movies has drawn significant research interests and led to many interesting applications. It is a challenging problem due to the huge variation in the appearance of each character. Although existing methods demonstrate promising results in clean environment, the performances are limited in complex movie scenes due to the noises generated during the face tracking and face clustering process. In this paper we present two schemes of global face-name matching based framework for robust character identification. The contributions of this work include: Complex character changes are handled by simultaneously graph partition and graph matching. Beyond existing character identification approaches, we further perform an in-depth sensitivity analysis by introducing two types of simulated noises. The proposed schemes demonstrate state-of-the-art performance on movie character identification in various genres of movies.***

Keywords: face identifies expression, graph matching, name face match, face detection.

1. Introduction

The proliferation of movie and TV provides large amount of digital video data. This has led to the requirement of efficient and effective techniques for video content understanding and organization. Automatic video annotation is one of such key techniques. In this paper our focus is on annotating characters in the movie and TVs, which is called movie character identification [1]. The objective is to identify the faces of the characters in the video and label them with the corresponding names in the cast. The textual cues, like cast lists, scripts, subtitles and closed captions are usually exploited. Fig.1 shows an example in our experiments. In a movie, characters are the focus center of interests for the audience. Their occurrences provide lots of clues about the movie structure and content. Automatic character identification is essential for semantic movie index and retrieval [2], [3], scene segmentation [4], summarization [5] and other applications [6].

Character identification, though very intuitive to humans, is a tremendously challenging task in computer vision. The reason is four-fold:

1.1 Weakly supervised textual cues [7]. There are ambiguity problem in establishing the correspondence between names and faces: ambiguity can arise from a reaction shot where the person speaking may not be shown in the frames 1; ambiguity can also arise in partially labeled frames when there are multiple speakers in the same scene 2.

1.2 Face identification in videos is more difficult than that in images [8]. Low resolution, occlusion, non-rigid deformations, large motion, complex background and other uncontrolled conditions make the results of face detection and tracking unreliable. In movies, the situation is even worse. This brings inevitable noises to the character identification.

1.3 The same character appears quite differently during the movie [3]. There may be huge pose, expression and illumination variation, wearing, clothing, even makeup and hairstyle changes. Moreover, characters in some movies go through different age stages, e.g., from youth to the old age. Sometimes, there will even be different actors playing different ages of the same character.

1.4 The determination for the number of identical faces is not trivial [2]. Due to the remarkable intra-class variance, the same character name will correspond to faces of huge variant appearances. It will be unreasonable to set the number of identical faces just according to the number of characters in the cast. Our study is motivated by these challenges and aims to find solutions for a robust framework for movie character identification.

2. Objectives

2.1 Input Design is the process of converting a user-oriented description of the input into a computer-based system. This design is important to avoid errors in the data input process and show the correct direction to the management for getting correct information from the computerized system.

2.2 It is achieved by creating user-friendly screens for the data entry to handle large volume of data. The goal of designing input is to make data entry easier and to be free from errors. The data entry screen is designed in such a way that all the data manipulates can be performed. It also provides record viewing facilities.

2.3 When the data is entered it will check for its validity. Data can be entered with the help of screens. Appropriate messages are provided as when needed so that the user will not be in maize of instant. Thus the objective of input design is to create an input layout that is easy to follow.

3. System Design

3.1 Structure

For face and name graph construction, the system represents the character co-occurrence in rank ordinal level, which scores the strength of relationships in a rank order from the weakest to strongest. The affinity graph used in the traditional global matching is interval measures of the co-occurrence relationship between characters.

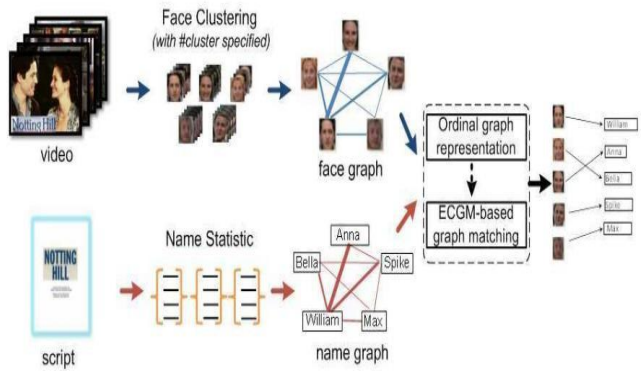

Figure 1: Architecture of face-name graph matching

3.2 Implementation

Implementation is the stage of the project when the theoretical design is turned out into a working system. Thus it can be considered to be the most critical stage in achieving a successful new system and in giving the user, confidence that the new system will work and be effective. The implementation stage involves careful planning, investigation of the existing system and it's constraints on implementation, designing of methods to achieve changeover and evaluation of changeover methods.

3.2.1 Login

In this module is going to explain the Robust Face-Name Graph Matching for Movie Character Identification designing and how we did the face detection and recognition in this project. The images will explain about the facial fetching details. After that admin going to login with the details which needed for the login page.

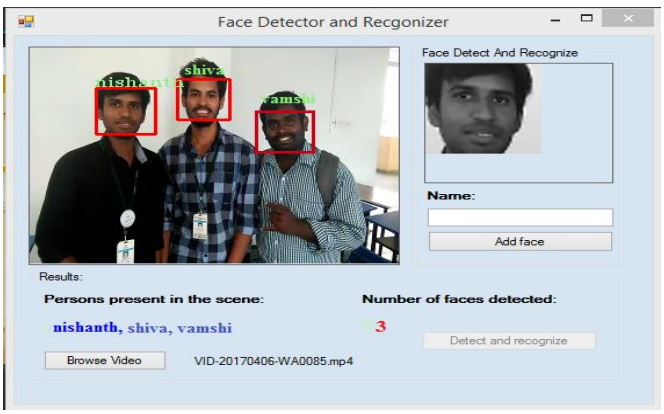

Figure 2: Face detector and recognizer

3.2.2 Detection

In this module we are going to detect the face of the movie characters. In this module we are using the emgu cv library we must install the emgu cv library. After installing the emgu cv lib in our project we need to add reference with the name emgu.cv, emgu.cv.util, emgu.cv.ui. When you will complete the references you will get the emgu controls in the toolbox.

3.2.3 Recognition

In this module we are going to recognize the face of the movie characters which is we previously stored on the face database. We just found that the give the real name of it. This is going to be done here. Here we are using the with the help of these eigenObjectRecognizer we are going to recognize the face.

3.3 Design

3.3.1Input Design

The input design is the link between the information system and the user. It comprises the developing specification and procedures for data preparation and those steps are necessary to put transaction data in to a usable form for processing can be achieved by inspecting the computer to read data from a written or printed document or it can occur by having people keying the data directly into the system. The design of input focuses on controlling the amount of input required, controlling the errors, avoiding delay, avoiding extra steps and keeping the process simple. The input is designed in such a way so that it provides security and ease of use with retaining the privacy. Input Design considered the following things:

- What data should be given as input?
- How the data should be arranged or coded?
- The dialog to guide the operating personnel in providing input.
- Methods for preparing input validations and steps to follow when error occur.

3.3.2Output Design

A quality output is one, which meets the requirements of the end user and presents the information clearly. In any system results of processing are communicated to the users and to other system through outputs. In output design it is determined how the information is to be displaced for immediate need and also the hard copy output. It is the most important and direct source information to the user. Efficient and intelligent output design improves the system's relationship to help user decision-making.

a) Designing computer output should proceed in an organized, well thought out manner; the right output must be developed while ensuring that each output element is designed so that people will find the system can use easily and effectively. When analysis design computer output, they should Identify the specific output that is needed to meet the requirements.
b) Select methods for presenting information.
c) Create document, report, or other formats that contain information produced by the system.

The output form of an information system should accomplish one or more of the following objectives.

- Convey information about past activities, current status or projections of the
- Future.
- Signal important events, opportunities, problems, or warnings.
- Trigger an action.
- Confirm an action.

4. Conclusion

We have shown that the proposed two schemes are useful to improve results for clustering and identification of the face tracks extracted from uncontrolled movie videos. From the sensitivity analysis, we have also shown that to some degree, such schemes have better robustness to the noises in constructing affinity graphs than the traditional methods. A third conclusion is a principle for developing robust character identification method: intensity alike noises must be emphasized more than the coverage alike noises. In the future, we will extend our work to investigate the optimal functions for different movie genres. Another goal of future work is to exploit more character relationships, e.g., the sequential statistics for the speakers, to build affinity graphs and improve the robustness.

5. Future Enhancement

In the future, we may investigate the optimal functions for different movie genres. Another goal of future work is to exploit more character relationships, e.g., the sequential statistics for the speakers, characters speaking in the scene, pose recognition and improve the robustness.

6. Acknowledgement

The words are not enough to press out the feelings of thankfulness to everyone who directly or indirectly helped in this work. I am thankful to Director, HOD and my institution CMR Technical Campus, Hyderabad which provided good amenity to achieve my work and finally like to thank my friends and family for giving great support to complete my work successfully.

References

[1] J. Sang, C. Liang, C. Xu, and J. Cheng, "Robust movie character identification and the sensitivity analysis," in *ICME*, 2011, pp. 1–6.
[2] Y. Zhang, C. Xu, H. Lu, and Y. Huang, "Character identification in feature-length films using global face-name matching," *IEEE Trans. Multimedia*, vol. 11, no. 7, pp. 1276–1288, November 2009.
[3] M. Everingham, J. Sivic, and A. Zissserman, "Taking the bite out of automated naming of characters in tv video," in *Jounal of Image and Vision Computing*, 2009, pp. 545–559.
[4] C. Liang, C. Xu, J. Cheng, and H. Lu, "Tvparser: An automatic tv video parsing method," in *CVPR*, 2011, pp. 3377–3384.
[5] J. Sang and C. Xu, "Character-based movie summarization," in *ACM MM*, 2010.
[6] R. Hong, M. Wang, M. Xu, S. Yan, and T.-S. Chua, "Dynamic captioning: video accessibility enhancement for hearing impairment," in *ACM Multimedia*, 2010, pp. 421–430.
[7] T. Cour, B. Sapp, C. Jordan, and B. Taskar, "Learning from ambiguously labeled images," in *CVPR*, 2009, pp. 919–926.
[8] J. Stallkamp, H. K. Ekenel, and R. Stiefelhagen, "Video-based face recognition on real-world data." in *ICCV*, 2007, pp. 1–8.
[9] S. Satoh and T. Kanade, "Name-it: Association of face and name in video," in *Proceedings of CVPR*, 1997, pp. 368–373.
[10] T. L. Berg, A. C. Berg, J. Edwards, M. Maire, R. White, Y. W. Teh, E. G. Learned-Miller, and D. A. Forsyth, "Names and faces in the news," in *CVPR*, 2004, pp. 848–854.
[11] J. Yang and A. Hauptmann, "Multiple instance learning for labeling faces in broadcasting news video," in *ACM Int. Conf. Multimedia*, 2005, pp. 31–40.
[12] W. Fitzgibbon and A. Zisserman, "On affine invariant clustering and automatic cast listing in movies," in *ECCV (3)*, 2002, pp. 304–320.
[13] O. Arandjelovic and R. Cipolla, "Automatic cast listing in feature-length films with anisotropic manifold space," in *CVPR (2)*, 2006, pp. 1513– 1520.
[14] D. Ramanan, S. Baker, and S. Kakade, "Leveraging archival video for building face datasets," in *ICCV*, 2007, pp. 1–8.
[15] M. Everingham and A. Zisserman, "Identifying individuals in video by combining "generative" and discriminative head models," in *ICCV*, 2005, pp. 1103–1110.
[16] R. G. Cinbis, J. Verbeek, and C. Schmid, "Unsupervised Metric Learning for Face Identification in TV Video," in *International Conference on Computer Vision*, 2011, to appear.
[17] M. Xu, X. Yuan, J. Shen, and S. Yan, "Cast2face: character identification in movie with actor-character correspondence," in *ACM Multimedia*, 2010, pp. 831–834.
[18] M. Everingham, J. Sivic, and A. Zissserman, "Hello! my name is... buffy automatic naming of characters in tv video," in *Proceedings of BMVC*, 2006, pp. 889–908.
[19] J. Sivic, M. Everingham, and A. Zissserman, "Who are you? – learning person specific classifiers from video," in *Proceedings of CVPR*, 2009.
[20] T. Cour, C. Jordan, E. Miltsakaki, and B. Taskar, "Movie/script: Alignment and parsing of video and text transcription," in *ECCV (4)*, 2008, pp. 158–171.
[21] T. Cour, B. Sapp, A. Nagle, and B. Taskar, "Talking pictures: Temporal grouping and dialog-supervised person recognition," in *CVPR*, 2010, pp. 1014–1021.
[22] Y. Zhang, C. Xu, J. Cheng, and H. Lu, "Naming faces in films using hypergraph matching," in *ICME*, 2009, pp. 278–281.

[23] Saltelli, M. Ratto, S. Tarantola, and F. Campolongo, "Sensitivity analysis for chemical models," *Chemical Reviews*, vol. 105, no. 7, pp. 2811–2828, 2005.
[24] E. Bini, M. D. Natale and G. Buttazzo, "Sensitivity analysis for fixedpriority real-time systems," *Real-time Systems*, vol. 39, no. 1, pp. 5–30, 2008.
[25] R. E. Hanneman, *Introduction to Social Network Methods*. Riverside, CA: University of California: Online Textbook Supporting Sociology 157., 2000.
[26] E. Bengoetxea, "Inexact graph matching using estimation of distribution algorithms," *PhD thesis, Ecole Nationale Superieure des Telecommunications*, 2002.

Author Profile

Jonnadula Narasimha Rao Associate Professor (pursuing Ph.D.), Department of Computer Science and Engineering, CMR Technical Campus, Medchal, Hyderabad, Telangana, India.

S Nishanth Kumar pursuing Bachelors of Technology in the stream of Computer Science and Engineering in CMR technical Campus, Medchal, Hyderabad, Telangana, India.

Chiluka Shiva Kumar pursuing Bachelors of Technology in the stream of Computer Science and Engineering in CMR technical Campus, Medchal, Hyderabad, Telangana, India.

Dontula Vamshi Krishna Rao pursuing Bachelors of Technology in the stream of Computer Science and Engineering in CMR technical Campus, Medchal, Hyderabad, Telangana, India.