Chapter 1 Foundations of Multimedia Information Processing

Anindita Das Bhattacharjee

Swami Vivekananda Institute of Science and Technology, India

ABSTRACT

It is easy to understand image and video stream by a human being but a computer can't understand them at all. For that reason there are several methods to make the computer to understand about the media it is being talked about. The following writing discusses about how to analyze a video or an image by using several methods like scene analysis, and shot boundary detection and analysis, frame analysis, hypermedia representation, segmentation of media. All of these are the representation of the whole media that have been fed as input and these representation outputs are used by computer by computer vision algorithm to process a video or image and give the expected results. The main focus of this writing is discussing how to use the above mentioned methods in any of the media video or image and extract the information required to represent the whole media under process.

BACKGROUND

Implementation of proper interface between user and machine is primary concern of computer engineers and it is the most statistical area where the concept of multimedia arrives. The focus and concern is to represent information and its presentation techniques. And now at present emerged application of multimedia is visible in internet where multimedia concept is integrated with networked computers. And the reason for popularity of multimedia documents is basically its fluent rich representation form.

Multimedia devices are mainly considered as "information content" processing devices. The main aim here is to focus the area in which the researcher may able to know-how audio-visual contents are useful in wide variety of platform. The research in this field may enhance the design skills; also it is a learning process that helps in understanding the effective representation of information across different media system. Concept of "multimedia" is generally made, for any "live" performance. Multimedia devices are generally as a "storeroom" and "experience" of multimedia content. Multimedia devices are

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represented as "electronic media" and the only difference that is visible form "mixed media" is that the multimedia device includes "audio".

The second major requirement is the area of resource management, environmental monitoring and so on. Basically in recent days there is scarcity of skilled manpower in the field of remote sensing, geographic information systems and many more fields. In this scenario, to train and increase the skilled manpower, multimedia is the only weapon by which classroom training for short intensive courses, distance education through telecast is possible.

In recent days a new trend of multimedia system is introduced where software consists of images, sample data, case studies that can be used for experiment with sample books on image processing are provided as study material, so that reader can experiment with given image to find out the working principle of the algorithm given. Hence, we can say that multimedia systems in our real life are very imperative to extract best technical benefits.

Now a day, multimedia system has extreme benefits in the educational fields. Form the above discussion it is understood that it provides learning opportunities to students and enables students to express themselves as designers, they are skilled in the field where they can use tools for analyzing the world also can interpret the information. Multimedia also helps the researcher to organize their personal knowledge, and also helps in representing the fact about what they know about others. In educational field, multimedia appears as computer-based systems and extensively uses associative linkage to permit the user for information retrieval and navigation. In this chapter, as an author I would like to focus on core techniques, of multimedia systems along with I would like to highlight on progress of image segmentation approaches, image enhancement, restoration, describe the process of modeling and feature extraction, and explain the core implementation details of image processing techniques. Fundamental and advanced concepts which are useful in bio-medical and image processing are also highlighted.

INTRODUCTION

Human beings can understand video and images better than any computer but computer can outperform a human in the means of computation. Say for instance from a live stream of video one specific face should be located and the person whose face is being tracked is also in motion is a crowd. It is almost impossible for a human being to detect that specific face in such a short time where the person is on the move and there are other people surrounding him. The computer if it has the proper algorithm written, can detect the face and track down the person with much higher probability of success than any human being. So the objective is not to make the computer understand a video stream or image better than human but to detect and separate objects better than any human being.

In general, concept of multimedia is defined as arrangement of two or more media such as image, text, video, animation, and sound. In this context the main relevance of multimedia is on the area of website design i.e. if we want to make dynamic and interactive website or else we want o make any traffic building tools and want to make them more attention-grabbing to online clients audio-video component of multimedia is the only option. For this purpose "streaming multimedia" is used in order to attach live-feeds with real time content in the web page. Hence, video is the most important concept in multimedia for recording, processing, and capturing electronic signals, digital media, and moving pictures. Videos, animations are used in general in e-learning courses. Digital video is significant and greater means of real world sound and image communication. Along with video another multimedia component audio is

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