

Chapter 1

Scope of Automation in Semantics–Driven Multimedia Information Retrieval From Web

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ABSTRACT

Present digital information driven society is a part of Semantic Web, where focus is on returning relevant information to the users, in response of their searches. Research community had been doing great efforts to associate semantics with textual information since early 2000. However, there had been tremendous growth in capturing, sharing, storing and retrieving photographs and multimedia contents on the web in last one decade. This has drawn attention of research community for embedding semantics with multimedia contents while storing, so as to lead efficient retrieval of these contents later on. This chapter focuses on presenting need of associating semantics with images, initially various techniques of image retrieval are elaborated. Existing techniques of embedding semantics in images are analyzed, further scope of automation in associating semantics with images is explored considering software agent technology as instrument.

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INTRODUCTION

Semantics in web focus on extracting meaningful information from web. It involves methods and techniques which can help extract textual and visual contents based on context of user's search. Seed of web semantics was sown by Tim-Berner's Lee in 1990's when he coined the idea of semantic web (Lee, Hendler & Lassila, 2001) as he could realize that with wide acceptance of WWW information overload would occur in future. Since WWW is an open system with no control on type, quality and amount of information been submitted by the participants, significance of this repository can only be retained if users are provided with relevant information in response to their searches. Due to the presence of vast volumes of textual and image based contents on web, manual access to every content is not possible which lead to development of application software termed as Search Engines which provided interface between users and ever-growing repository of information. Initially SEs were providing web pages based on keywords of search query only, thereby returning more number of irrelevant web pages. Subsequent researches focused on improving algorithms for searching, indexing and retrieval of information based on context of search. However, this also involves filtering of search results based on predefined contexts available with SE. If the context desired by the user is not defined in SE, then user will have to compromise as irrelevant results would be obtained. Solution to this problem is to embed meaning of information in web contents itself, which will help SE in better deciding when to return which contents to users.

Lot of research has been carried out towards embedding and extracting meaning of textual information i.e. information comprising of words. However, from last one decade, large amount of visual information is getting uploaded, stored and retrieved. With advent of mobile computing, internet and mobile phones have become important part of our lives and medium of internet access for all of us. Modern hand held mobile devices are equipped with camera to capture still photographs and high quality videography. People share photographs on social networking sites to express themselves. With trend of capturing photographs, search for images has also increased. 'One image can speak thousand words' this phrase is leading the society. Images are widely asked for education, entertainment, emotional expression and so on. With increased demand of images, need to index the images was felt. Today vast amount of images of various objects & places are available in various databases but searching and extracting relevant images is a prevailing issue. Although, research community is putting rigorous efforts towards developing techniques through which meaning of image contents can be extracted so that it may be stored with image itself and image may be retrieved based on its contents.

This chapter focuses on elaborating techniques available for embedding meaning with textual and visual information. Tim Berner Lee's vision of semantic web can

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