

# Social Multimedia and Storytelling

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The pervasive use of media-capturing devices and the increasing adoption of online social networking platforms have led to the proliferation of digital content that documents the real world—everything from landmarks and points of interest to live concerts and demonstrations. Such content holds great potential for creating richer representations of real-world entities and helping tell engaging stories about them. This is due to not only the abundance of diverse media sources but also the availability of a large variety of contextual information, ranging from location metadata and textual descriptions to online interactions and user feedback (in the form of ratings and comments, for example). Leveraging social multimedia content and its surrounding context

thus presents new opportunities for better capturing and describing the stories that unfold in the real world, and for telling them in innovative ways to large and remote audiences.

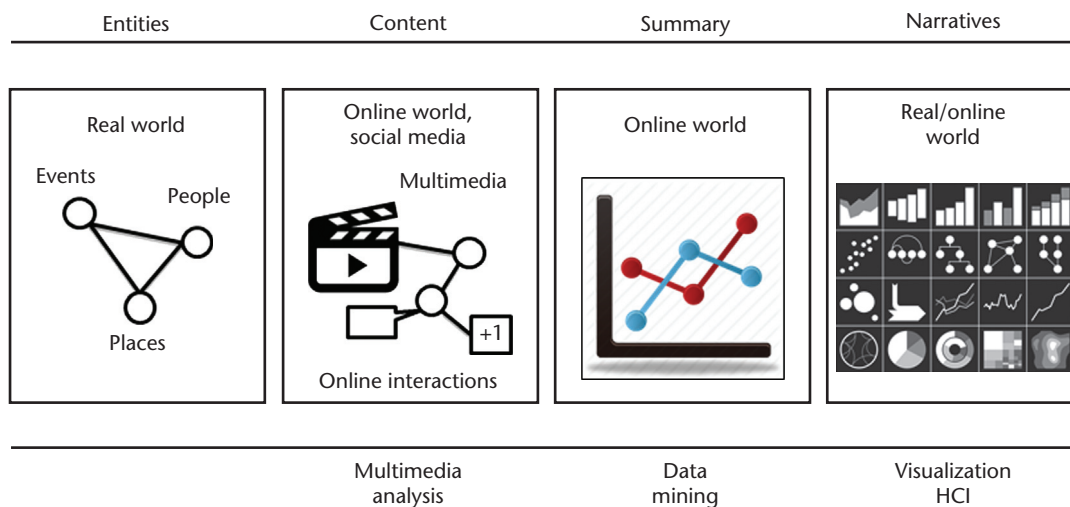
However, the uncontrolled nature of user-contributed content and the complexity of the social media life cycle raise significant research challenges related to both the effective collection, mining, and indexing of social multimedia and the combination, creative reuse, and presentation of such content. To this end, this special issue on social multimedia and storytelling presents recent advances in this exciting new area, building on research results presented at the First International Workshop on Social Multimedia and Storytelling (SoMuS; <https://sites.google.com/site/socialmultimedystorytelling>), held during the International Conference on Information Retrieval (ICMR).<sup>1</sup> In particular, the workshop included several presentations and two keynote speeches on pertinent research problems, ranging from multimedia sharing and ranking to event-based multimedia indexing, hyperlinking and summarization, and storytelling.

## Research Challenges

People tend to tweet about their daily activities and interesting stories. They take pictures of the places they visit and share them in their social network. They make videos of the events they attend and share them in real time. Making sense and utilizing such multimedia content—available at unprecedented scales—holds the potential for telling stories in new engaging ways to large, geographically dispersed audiences. However, the nature of social multimedia raises research challenges that call for new multimedia analysis and retrieval approaches. For example, much of the content shared through social media is not original, it's often of low or insufficient quality, and it frequently lacks sufficient metadata (location data, tags, and so on).

Following the different stages within the life cycle of social multimedia content, there is a profound need for technologies that support the collection, processing, and mining of social multimedia content. We also need novel means for visualizing information and interacting with the original storytellers and with those interested in analyzing the narratives developed in the context of online social interactions.

We visualize the landscape of social multimedia and storytelling as a process starting from the definition of a real-world entity, such



**Figure 1.** *The landscape of social multimedia and storytelling: from real-world entities through multimedia analysis and mining to narratives.*

as an event, which is then enriched with multimedia content collected from social sources (see Figure 1). This is followed by a summarization step, where different important aspects and elements of the event are extracted. Given appropriate technological means to effectively harness the aforementioned steps, a storyteller can create powerful media-rich stories around real-world entities and better capture the existing narratives that are born and evolve within the social media space.

Given this setting, this special issue touches on many significant aspects of multimedia retrieval, including content analysis and understanding, content- and context-based indexing, search and retrieval, human-computer interaction (HCI) technologies, and image and video summarization and visualization. It thus converges on the nexus of social multimedia and storytelling around real-world experiences, events, and places. Aside from the challenging research problems in this emerging area, its topics are linked to a host of important commercial and creative applications in sectors such as media, entertainment, arts and culture, sports, and music.

### In This Issue

The special issue includes four articles covering a wide spectrum of research problems and approaches across the landscape depicted in Figure 1.

One of the first problems in the area pertains to the detection of events in large collections of social multimedia—that is, the automatic organization of user-generated content in groups of

media items that illustrate specific events of interest (such as concerts or parades). “Cross-Platform Social Event Detection,” by Maia Zaharieva, Manfred Del Fabro, and Matthias Zeppelzauer, discusses an experiment on a large dataset of Flickr images and YouTube videos that investigates the usefulness of different metadata categories, such as timestamp, location, and owner (contributor) for automatically grouping the corresponding media items into events. Using a publicly available benchmark dataset (MediaEval SED), they highlight the high event-detection accuracy that can be achieved using even limited amounts of metadata, yet noting the lack of sufficient evaluation datasets for assessing the effectiveness of event detection across different social media platforms.

Another important research problem in this area is exposed in “Syncing Shared Multimedia through Audiovisual Bimodal Segmentation” by Dimoulas A. Charalampos and Andreas L. Symeonidis. The authors explore the hypothesis that merely analyzing the audio features of multimedia content (video) can be a first cost-effective multimedia analysis step that can lead to meaningful event-oriented annotation of content. In particular, the article presents an audio-driven multimedia alignment framework that integrates the advantages of state-of-the-art audio matching, multimedia semantics, and social (user-defined) features, through joint bimodal-segmentation and alignment to detect and synchronize multimedia events. The use-case scenarios of the proposed framework vary from sports videos and social and entertaining events to lectures and meeting records.

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**The conducted user studies demonstrate that the system offers an engaging and effective tool for event-focused user communities to create and share stories through online media.**

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The third special issue article, “CitySensing: Fusing City Data for Visual Storytelling” by Marco Balduini, Emanuele Della Valle, Paolo Ciuccarelli, Matteo Azzi, Roberto Larcher, and Fabrizio Antonelli presents a framework that jointly mines streams of social media data and call data records during city-scale events and repurposes the results of the mining process to feed a public installation. The article aspires to convey, through visual storytelling, the city’s activity patterns to the on-site audience. They present a real-world case study of the proposed framework that is centered on the Milano Design Week 2014.

The final article, “Let’s Share a Story: Socially Enhanced Multimedia Storytelling,” by Mu Mu, Steven Simpson, Nicholas Race, Omar Niamut, Gijs Koot, Rianne Kaptein, Jacco Taal, and Luigi Mori, presents an end-to-end system for online multimedia storytelling. The proposed system encompasses a Web and a mobile application for video capturing, sharing, searching, and story authoring. The system leverages a number of sophisticated multimedia processing capabilities with the goal of making story authoring more efficient and facilitating the integration of user-generated content in the authored stories. The system was showcased and tested in two real-world case studies around the Schladming Night Race 2014 and the Silverstone British Grand Prix 2014 F1 racing event.

One of us (Ramesh Jain) also wrote a Spotlight department, “Let’s Weave the Visual Web.” In this piece, Jain suggests that photos

are becoming new documents. He paraphrases the vision behind the World Wide Web and says: “Suppose all photos and videos were linked to other photos and videos and other types of information sources. Suppose I could create a space in which all visual data were linked and were linked to textual information also.” According to Jain, the Visual Web, along with its enabling technologies, are “entwined with the research problems and applications of social multimedia and storytelling.”

### **Future Directions**

Despite the considerable research interest and amount of advances in social multimedia and storytelling, there are still open research problems and some relatively less explored areas. For example, many previous studies focused on social multimedia coming from a single social media platform, so there’s a lack of solid approaches for leveraging multimedia and interactions from multiple platforms.

Furthermore, the bulk of research efforts to date have focused on problems related to the discovery, collection, indexing, and mining of social multimedia content. In contrast, there are only a few approaches that emphasize the narrative and storytelling aspects of social multimedia (the articles in this special issue are among the few in this area).

We expect that key research aspects of increasing importance in the area will include the diversity of multimedia content used in narratives, the perceived quality and aesthetics of social multimedia, the means of visualizing and interacting with social multimedia with a focus on highlighting the underlying stories, and the development of new primitives and paradigms that can be used to create richer and more engaging storytelling experiences. **MM**

### **Acknowledgments**

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### **Reference**

1. S. Papadopoulos et al., “SoMuS: Social Multimedia and Storytelling,” *Proc. First Int’l Workshop Social Multimedia and Storytelling*, 2014; <http://ceur-ws.org/Vol-1198/overview.pdf>.

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