# Raconteur:
# Integrating Authored and Real-Time Social Media

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## ABSTRACT

Social media enables people to share personal experiences, often through real-time media such as chat. People also record their life experiences in media collections, with photos and video. However, today's social media force a choice between real-time communication, and authoring a coherent story illustrated with digital media. There is simply not enough time in real-time communication to select and compose coherent multimedia stories.

We present *Raconteur*, which introduces a new style of social media combining aspects of the real-time and authored styles of communication. It is structured around a text chat, augmented by an agent that continuously interprets the chat text to suggest appropriate media elements to illustrate the story. A small experiment shows that storytellers find Raconteur's suggestions helpful in presenting their experiences, and audiences find the interaction engaging.

## Author Keywords

Storytelling, conversation, chat, social media, life stories, commonsense computing.

## ACM Classification Keywords

H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

## General Terms

Human Factors, Design, Languages.

## INTRODUCTION

Recent times have seen a great explosion in the popularity of social media, giving people new ways of connecting and forming relationships and communities. Today's social media, however, are sharply separated into two distinct forms:

• *Real-time experiences*, such as text chat, mobile text messaging, audio or video chat (via VOIP software, or mobile phones), Twitter, etc. involving two or more people.

• *Authored media* forms such as Web pages, including blogs, Facebook, Flickr photo collections, YouTube videos, etc. usually created independently by an author.

Each category provides distinct advantages (and problems). Real-time experiences provide the excitement of immediacy, and the potential for serendipitous moment-to-moment interaction between participants. Several research projects aim to enrich the real-time "chat" experience among human users with multimedia data: Comic Chat enhanced text chat in the form of a dynamic, graphical comic strip [9]. Family Story Play supported video chat for grandparents to read books together with young grandchildren [13]. Geyer *et al.* designed an interface "Chat Spaces" for threaded conversation with collaboratively activity content [8]. MapChat enabled users to discuss and navigate the location-based information synchronously on an interactive map [5]. However, few real-time systems focus on understanding the chat content between users at a story level. They suffer from the problem that conversations can wander off-topic, or become shallow or incoherent.

Authored media provide the opportunity for greater reflection, structuring a story coherently and engagingly according to the narrative principles of literature or cinema. Authored media can be composed by piecing together various elements from independently produced or independently captured media artifacts. The elements can be arranged so that they make coherent points and present a meaningful narrative arc. TELLSTORY, for example, was groupware that supported collaborative storytelling for documenting tacit knowledge [11]. Gervas presented a review of several narrative systems and discussed models of computational creativity [7]. However, authored systems inhibit possibilities for real-time interaction exploration and personalization. These forms are prepared by an author in advance of interaction and are consumed by an audience. The audience is usually passive, and does not contribute material at the time of consumption.

The aim of this paper is to introduce a new kind of hybrid of these two kinds of social media, which we refer to as *assisted conversation*. The idea is to structure the media interaction between a storyteller and a story viewer basically as a real-time chat. The chat is observed by the system that uses novel natural language processing, a

Commonsense knowledge base, and new reasoning techniques to suggest media elements that contribute meaningfully to telling a story in a coherent and engaging way. In this way, we hope to recapture some of the narrative power of authored media, while retaining the immediacy of person-to-person real-time interaction.

A companion paper [3] explains in more detail the natural language processing and inference algorithms underlying the suggestion engine. The present paper focuses on the motivation from literary theory, user interface design, and social media aspects of the user study. An earlier paper [4] reported a formative user study, and briefly described an earlier version of Raconteur, emphasizing the story analogy features. The present user interface, *Raconteur 2*, (hereafter simply Raconteur) has been completely redesigned from [4], and we feel this design represents an important contribution of this paper.

## DESIGNING FOR CONVERSATIONAL STORYTELLING
Our design is based on theories of conversational storytelling from literary criticism [12]. Conversation involves one speaker and one listener that jointly create stories. For the speaker, the purpose is to share life stories, containing narrative elements such as characters, events, and causal connections. For the listener, the aim is to respond to, and to acknowledge what has been said, as well as give feedback, and perhaps reciprocate by sharing his or her own stories. Unlike speeches or interviews, conversational stories are created in a meaningful progression where either the speaker or the listener can introduce or react to particular topics.

Based on the studies, we defined the following three design principles:

### Help the User Make Interesting Points During the Story
First of all, from the social perspective, "stories are told to make a point, to transmit a message – often some sort of moral evaluation or implied critical judgment – about the world the teller shares with other people" [12]. Our interface should assist a storyteller to stay on a topic, connect the events, and communicate his or her own experiences to a listener.

### Support the User in Creating High-Level Story Patterns
Second, story understanding requires connecting perceived story elements in a structured way. The idea of a "story grammar" or "story skeleton" explains how humans construct and comprehend a story by a set of rules, as well as how the underlying story structure might alter the listening experience [1,14]. To assist authoring with connected story events, it is important to help storytellers structure their presentation during the chat process.

### Empower Human-Human Interaction
Third, conversational storytelling provides the opportunity for intelligent systems to understand the narrative intent behind digital media elements, based on human dialogue. As non-real-time conversations between online users over user-generated content become more widespread [2,6], we believe such integration of instant chats and authored media with personal life stories would contribute to both the author's and the audience's interests. Consequently, we aim to provide an agent that assists, rather than replaces, human dialogue.

## CHATTING THROUGH RACONTEUR
Fig. 1 shows a partial view, a chat box, of the Raconteur's web-based user interface, for a *storyteller* and a *story viewer* to chat together in plain text by inputting in the chat box or chatting on any element directly. The storyteller can see the suggested media files by Raconteur (left) and edit the story by drag-and-drop of elements (right). In this interface, he can also see a preview window, the whole media repository, and story pattern suggestions, which are not shown to the story viewer on the other side. This will motivate the viewer to follow the teller and remain engaged, without the temptation to independently browse the media. The final output of the system can be either a chat log for private use, or a script with the selected scenes and users' narrations for later video editing.

Successive chats between the storyteller and different story viewers may generate different story paths, due to differing interests of the viewers. Later iterations may be able to
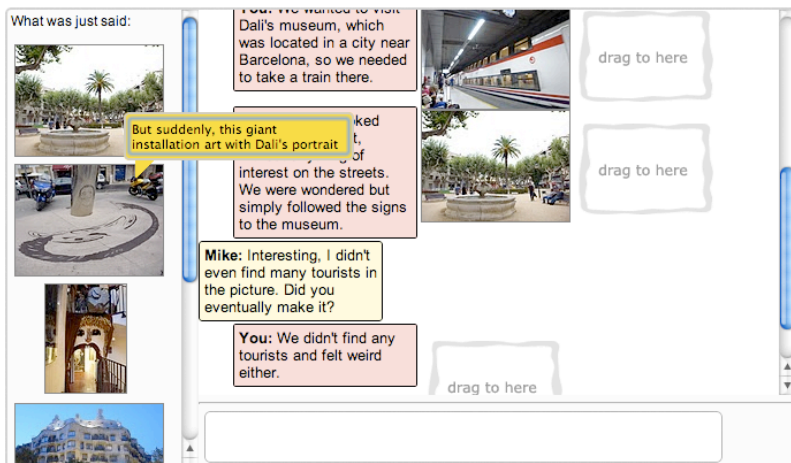


**Fig. 1. The main component, a chat box, of the Raconteur UI**
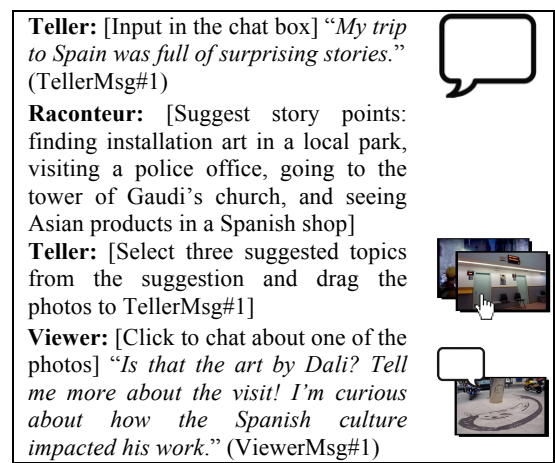


**Fig. 2. Telling a travel story**

combine ideas from multiple paths, leading to semi-automatic generation of branching or personalized stories.

## Scenario of a Chat About a Travel Story

Fig. 2 presents a scenario of telling a travel story. Raconteur enables storytellers to chat about their stories in a personal repository from an online media collection platform such as Picasa. We assume that most of the media elements are annotated with a sentence or two in unrestricted English, usually describing the particulars of an event. Annotation is entirely optional, and the user may also manually select unannotated elements to include in the story. Full-sentence annotations are a much richer source of metadata than single-word "tagging". Tagging is currently popular because keyword matching is more straightforward than determining relevance of sentences to each other, but our NLP analysis is indeed able to do this.

Our goal is to assist the real-time chat by presenting connected visual elements at a story level. First of all, we perform natural language processing (NLP) on both the annotations and the chat text, using *part of speech tagging* (to identify verbs, nouns, and adjectives/adverbs as semantic "*concepts*" that may contain contextual information), *named entity recognition* (to help categorize basic story elements such as characters and geographical areas), and *stemming and lemmatization* (to normalize words into the basic forms for processing). Then, we extract and compute these concepts by representing as a list of computable vectors. Based on a powerful analogical reasoning tool called AnalogySpace [15] analyzed from a large Commonsense knowledge base ConceptNet [10], we compare the users' chat message and the annotation on each media element to determine the similarity of semantic meanings. For example, narrations that contain concepts of "art", "museum", "gallery", "sculpture", and "inspiring" will be classified in an art-related category.

Most interesting is that this analysis is used to recognize *story patterns*, high-level structures that make stories interesting to the viewer. For one example, the text "trip" and "surprising stories" triggers one kind of story pattern -- "*expectation violation*". Unexpectedly encountering a Dali installation in a park, getting a wallet stolen, or juxtaposition of disparate cultures are possible matches to this pattern. Additional details of the analysis and recommendation procedures are found in [3].

## USER STUDY

To understand if Raconteur succeeded in helping authors to communicate life stories with friends using personal digital media, we conducted a usability study with 10 participants as 5 pairs (5 storytellers and their invited story viewers), of whom half were male and half were female, aged from 23-32 years old. All of the participants were frequent users of social network websites. They updated their social network status once every four days on average, and updated personal albums with photos and/or videos once per week. They expected their friends to respond by adding comments, ratings, or reciprocal sharing.

To acquire the material to chat, we asked participants who served as storytellers to upload and annotate samples of their personal media files (photos and/or videos) to our Picasa account. Then, each pair of participants was allowed to chat and edit the collection through Raconteur. We conducted a post-test interview for each pair.

## Facts About the Material and Chats

The topics chosen included: a 5-day sponsor visit to Italy, a one-week trip to Spain for a conference, two beach parties, and a weekend at Pittsburgh for a social event. On average, the size of each uploaded repository was 70.2 media elements, containing 98.0% still photos and 2% short video clips (most within 30 seconds). 97.2% of the files were annotated; the average length of each caption was 10.0 words. The average time of a chat session was 23 minutes; 52.7% of the chat messages were from storytellers and 47.3% from viewers. The conversations were usually balanced between the tellers and viewers. On average, 33.1% of the media files were used in a chat.

## Feedback on Real-Time and Authoring Aspects

We were interested in verifying two things about the user interaction. First, that Raconteur was helpful to the real-time nature of the chat that it did not distract them from the friend's chat and that the visual material assisted engagement in the activity. Second, we were interested in seeing if storytellers felt that Raconteur supported their ability as authors to generate coherent stories and communicate meaningful points.

## Raconteur Enhanced the Real-Time Nature of Chat.

Raconteur succeeded in finding supportive visual material in real-time. All the narrations, comments, questions were on-topic. Storytellers followed the system's suggestions 98.2% of the time by dragging-and-dropping a Raconteur-suggested media file into the conversation or chatting on a file, instead of looking for files from the repository (1.8%). We found storytellers saw a media element and decided to chat about that element, initiating by narration such as "*This shows how (…)*", "*Like this one*", etc. That is to say, the real-time suggestions guided the storytellers to continue a topic and brainstorm the story development.

## Raconteur Improved Narrative Engagement.

All story viewers reported high narrative engagement in the story. Post-interviews showed they could remember and recall the story details. "*It was so impressive to see the pictures and understand the content when I was chatting.*" and "*I usually found myself getting lost after I watched a slideshow of an online album, but using Raconteur brought me into the scenes.*" The interaction helped the audience achieve control of the story content: "*I also could see how my friend chose the specific scenes based on my questions. I'm glad that my questions were heard and I could somehow control how the story could be developed.*" The prompt response from the viewers (5.5 seconds on average) also suggested that the audience was engaged in the process and was willing to explore the story with the author.

Moreover, we observed storytellers often added new information to the media elements instead of just repeating the annotations. The most obvious example was to explain the background of a character (e.g. "The bass player tied a bell around his ankle so he was dancing all the time while performing.", which might not easily be seen neither in the photograph nor from the original caption "You will find street art performance everywhere, but this music band was especially incredible.") We also found them presenting personal goals or inner thoughts (e.g. "The conference demo, which was the purpose of this trip, made me so nervous in the first few days. That was why I looked so worried, hardly with a smile, in those photos."). This showed that storytellers were aware of the audience's story model. Meanwhile, viewers all agreed that the resulting stories were more informative than only reading the captions (score 4.8 out of the Likert-5 scale). This also indicated our approach would help the audience follow the content more smoothly compared to seeing a mundane slideshow simply in chronological order.

**Raconteur Helped Authors Make Impressive Points.**
The high scores (4.8) to the questions from the questionnaire indicated Raconteur helped storytellers make impressive "points." In the post-test interviews when we asked the viewers to recall the chatted stories, they were all able to recount the exciting, impressive points that they had not expected, such as an interesting game, a special performance, something the friend had achieved, etc. This matched the important feature of sharing life stories with reportable events [12].

However, there were also some concerns. Chatting with a friend can sometimes be very intimate because of the close relationships. Chat messages, especially, tend to contain personal opinions, and conversational narrative is less structural for reading by outsiders. Moreover, some participants were not sure how well the system would work if they were confronted by an aggressive viewer who frequently interrupted. The nature of conversational storytelling makes this system most suitable for personal, one-time chat. If a future system would be considered as a video-editing interface, it might be helpful to track the relevance of the chat messages and to incorporate a phase of reviewing a created story before final publication.

**CONCLUSION AND FUTURE WORK**
We have presented *Raconteur*, an enhanced text chat system that introduces a new style of social media, *assisted conversation*. Raconteur combines aspects of the real-time and authored styles of communication. Raconteur is augmented by a software agent that continuously interprets the chat text to suggest appropriate media elements to visually illustrate the story. Our experiment shows that storytellers find Raconteur's suggestions helpful in making impressive story points, and keeping the audience highly engaged in the chat. We are preparing for a more detailed study to more directly compare conventional chat, non-real-time authored media, and Raconteur-type systems for personal stories. We are exploring the opportunities to apply this approach to other areas such as production of professional media like news and documentaries; knowledge sharing; and product review analysis.

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