

# Wonderland in Pocket

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## ABSTRACT

M-Views is an experimental video story-making and sharing system designed for distribution to mobile hand-held video-capable devices. Video stories are constructed using the M-Views authoring tool, which allows makers to preview how segments will be sequenced based on any possible navigation path of the viewer. Inspired by environmental artworks and multiple perspective films, narratives designed for the M-Views system tend to incorporate the opportunity for the story to merge with the architectural surroundings and, in the future, with the activity of the participant. As we explore the mobile story form of the future, the following questions guide our inquiry: What story structures/gaming strategies most actively engage the audience as a participant in location-based video drama? Given a few prototypes and a network, will a community of makers emerge who want to develop this genre of video art? What special tools does the mobile story-maker/artist need to create engaging location-based cinema? In this paper, we describe the M-Views platform and our experience in two experimental story productions.

## INTRODUCTION

Ever since its invention, cinema has been expanding to make use of smaller, more accessible, consumer oriented technologies. Today, video cameras and video displays are increasingly incorporated into portable/mobile electronic devices such as cell phones and PDAs. As it becomes possible to receive cinema as part of one's everyday activities, we ask how mobile cinema will transform traditional models of cinema and television.

Whether projected through celluloid or transmitted using analog or digital encoding schemes over broadband networks, cinema and television are modeled on delivery of a more-or-less immutable image stream that will be viewed continuously, almost irrespective of context. In contrast, digital video provides a database model for cinema in which short sequences are stored and served according to some programmable criteria; often this selection makes use of contextual data to support personalization. When we incorporate the location of the mobile client as context, cinema is transformed from a continuous 3<sup>rd</sup> person experience into a discontinuous 1<sup>st</sup> person experience in which the story is augmented by the architectural surroundings.

How will this location-aware delivery of movie elements to the viewer as they navigate space transform the cinematic story form? Depending on the design of video content and service, the participant may merely experience an augmentation of the world they are navigating or they may become immersed in active role-playing. This role-playing may be directed or non-directed but will require the audience to step into what appears to be some form of public street theater. Increasingly, these experiences will invite participation by the consuming audience, either as players in a completed story or as messengers and game-masters who are able to alter the experience in which the players are immersed on-the-fly.

The M-Views research project explores ideas, methods, and culture that may affect the experience and creation of mobile cinema. A specific goal of the research is to provide a mobile tool kit that can support widespread creative adoption of mobile story construction. This paper presents initial

progress and results.

## BACKGROUND AND RELATED RESEARCH

Some clues about the future of mobile cinema can be derived from role-playing games and from Janet Cardiff's work "Video Walk," [7] which premiered at the "010101: Art in Technological Times" exhibit at San Francisco Museum of Modern Art in 2001.

Role-playing games come in a variety of flavors but generally they involve the design of the story circumstance and a set of characters with pre-assigned goals, personality traits, and resources. Individual participants are assigned particular roles; often they design their own costume. Action plays out over the course of some specified time in an improvisational fashion. Often a "game master" (sometimes also the designer) is able to guide the action in certain directions by releasing new resources or circulating anonymous messages during game play.

In Janet Cardiff's "Video Walk", museum visitors were invited to pick up a video camera and actively follow a cinematic scenario as it was shot throughout the museum space. In this work, the spatial perspective in the cinematic action is closely akin to the spatial perspective of the world that is being navigated by the viewer. The déjà vu confusion that results from trying to match the virtual images to the real world provides an unsettling handle to the viewer's own life. Cardiff said, "You forget which is the real thing – because the video image is aligned with where you're walking. It has a weird psychological effect on the brain." In the case of Cardiff's work, the audience had the sense that they were controlling their passage through the experience. The explicit and continuous architectural connection between the virtual and the real provides one touchstone for the construction of mobile cinema.

For two decades, the Interactive Cinema group has focused on exploring emerging story forms and technologies for delivering personalized cinema. Recently Flavia Sparacino developed a museum wearable; her "storychastics" [11] approach incorporates predictive modeling of the visitor experience to deliver personalized exhibit information. Barbara Barry's current work applies common sense reasoning to story decisions that will be made by amateur videographers equipped with wearable cameras. Kevin Brooks' [8] PhD work, "Agent Stories," demonstrates how we might incorporate story knowledge in order to orchestrate a multi-point-of-view drama. In 1996, Micheal Murtaugh's Contour showed how a spreading activation network could provide associative continuity to an individual navigating a large cinematic database system, [5]. These research projects have been particularly helpful in understanding the challenges and opportunity inherent in a database story model; this understanding can now be applied to mobile cinema.

In addition, research projects which focus on developing intelligent context-aware systems for mobile applications such as Shopping Assistant [1], Cyberguide [4], Adaptive GSM phone and PDA [2], Augmented Reality [3], Fieldwork [6], and Location-aware Information Delivery [9], provide us with perspectives concerning technological design and user studies.

## THE M-VIEWS TOOL KIT

The adoption of mobile cinema requires a pocket-sized platform that knows where it is located and that can (minimally) receive video and send text messages. Further, if mobile cinema is to become a dominant form, makers will require a tool-kit that supports their ability to conceive, build, and produce a mobile cinematic story with a minimum of engineering overhead.

As a first level enabler, the M-Views project has implemented such a client-server delivery platform and production tool-kit. Implemented on a Compaq iPAQ with GPS and 802.11 connectivity, the M-Views client is location-aware and multimedia capable. A robust instant messaging tool has been built into the client software to allow viewers to leave messages for other in time, space, or under certain variable conditions according to the story.



Figure 1 M-Views Client

The M-Views Server is built from Java Servlets that maintain an XML database of video sequences, message events with delivery guaranteed, as well as web-based administration. The API is freely available so that anyone can develop new clients, authoring tools, and content with ease.

Finally, M-Studio, [10] provides a PC-based multimedia-authoring tool for designing, editing and examining context-aware stories that are viewed in mobile environments. M-Studio allows authors to develop multi-threaded stories that unfold in time and space. Authors can enter scenes into storylines and associate them with a location. Additional context information and rules pertaining to story structure can be added as they are needed. The authors can use the simulation tool to debug the story by playing back the content as it would be received when a user follows a particular path. When the author is satisfied with the content play-out, M-Studio can create an XML story script that is uploaded to the server along with the video content, making the story available for viewing on a client iPAQ.

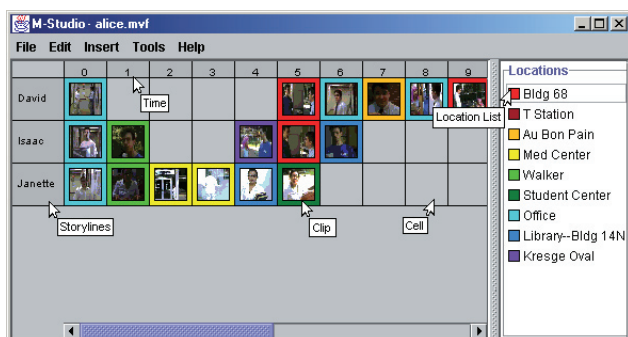


Figure 2: M-Studio

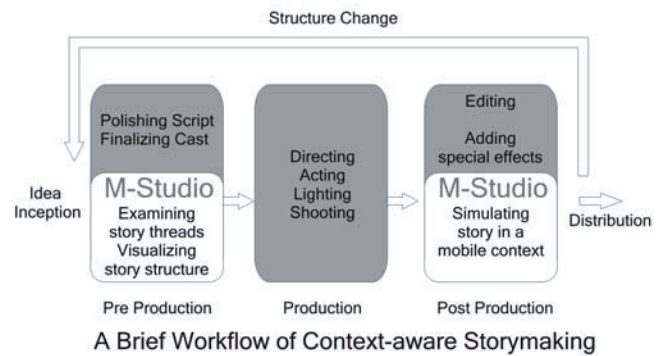


Figure 3

## M-VIEWS PRODUCTIONS

A critical aspect of our research is to understand how best to shape story content for mobile, context-aware systems. Will the story receivers actively embrace a player role? How can we best use architectural space and time to augment the receiving experience? Will the mobile story channel prove inspirational and actively engage a broad range of people to make their own productions? To help explore this question, we invited undergraduate UROPs (Undergraduate Research Opportunity Program) to join us in creating video content for the platform.

We use a collaborative brainstorming and improvisational theatrical approach to the story development. In the paragraphs that follow, we describe three production ideas, two of which have been or are in the process of being implemented.

When we were first developing the M-Views system, we had the idea that, given a mobile client, story makers would like to produce and embed a video sequences in a particular place.

These sequences would then be picked up at a designated time by someone known or unknown to the author. These segments did not need to be part of a larger drama; rather they could be poetic in nature, rather like postcards that make a single unique connection between the place, the sender and the receiver.

In addition to location, context-aware in this example might reflect time of day or a more personal level of arousal. We developed a short scenario around this concept: Gill goes to Au Bon Pain for lunch at around 3pm; while there, she notices that a new video message has appeared in her email in box. She plays the scene which includes a dialog about a secret object. The segment was recorded at Au Bon Pain around 3PM; the dialog allows us to guess that the segment was filmed the day before. Although we never implemented this application, we hypothesized that it would be most compelling when the particular receiver felt that the movie was destined just for her.

As we continued to brainstorm, two of our UROP students who were most committed to the M-Views production suggested that they would like to develop a "who-dun-it" story. They effectively argued that with a "who-dun-it" structure, they could assign the viewer the role of the investigator. The product of this idea, "Another Alice," was completed in 2001.

In this story, which takes place on the MIT Campus, the participant meets various characters who reveal aspects of the situation and suggest where they are off to next. These clues invite the participant to follow the story by following particular characters across campus. The story experience varies based on the actions of the participant.

In this production, the M-Views client uses GPS information to track the location of the participant across the MIT campus. Location information plus time are used to trigger the playback of particular story segments.

The complexity of this story, with three main characters and four different possible endings, inspired the creation of M-Studio, a pre-visualization and simulation tool that allows authors to view the sequential play out of a story, given any path the viewer could possibly take.



Figure 4: Screen Shots from Current Production

A few dozen people have now experienced this movie with mixed results. Most people have no trouble getting a feel for the form and following the characters. However, many people want to run other applications on their iPAQ, so they have expressed a preference to have the movie segments come into the hand held as an email attachment. Almost all viewers asked when the platform would allow multiple people to engage in a story. Finally, many people suggested that the story would be better if more interactive message exchanging could take place.

In early summer 2002, we began to brainstorm a new production. We decided for practical reasons (closeness to the lab and the availability of the 802.11 network that spans the campus) that we would once again locate the production on campus. First principles for this production include that the project should appeal to almost anyone – parents, academic visitors, locals - who visits the campus. In addition, the project should have an evolving structure so that new story makers can easily add segments time and so that the data base of segments could grow quite large. The core vision for this project was a story web that could offer the magic of a “son-et-lumiere,” and bringing people into the life of the campus.

While none of the UROPs working on this project had much experience making video, three of the four of them have had some theatrical training. Their experience with drama made them enthusiastic about taking a dramatic rather than a documentary approach to the problem of shaping a story. From the beginning we needed to understand how a story could be both dramatic and evolving? We agreed that each UROP should develop a character – a student with a past difficulty, a future goal and a present state. They were to determine what this student was doing

around 8AM and again at 8PM. A few scenes in the life of these students would provide the basics for the story web. Following the taping of the initial scenes, we would develop a range of scenes that drop the viewer into the past or that launch them into the future. This story will be run for the first time this fall.

## CONCLUSIONS

While multi-threaded stories for ‘interactive’ entertainment have been envisioned over the over the past quarter-century, and many prototypes have been created, we are still in the early days of developing compelling forms. Game scenarios, documentary portraits of place, and poetic exchange are all candidates for context aware storytelling. Wireless handheld computers that display video offer us a novel and exciting opportunity to create a mobile movie form that will provide a fun, compelling, and entertaining experience.

We believe that the mobile channel as it is now emerging could be the channel for a new cinema. The developments above explore some of the opportunities and challenges for this new cinema. By incorporating client mobility, our movie sequences find you as you navigate space. The story web concept provides an extensible structure. Today UROPs are engaged in a sociable collaboration as they make new content.

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