Moodlog: Touring in Mood of Place

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***Abstract*— This paper presents an interdisciplinary study on social science and computing technology to build a novel touring system toward representing the inner mood of place for the tourists. Ordinary touring systems are generally considering touring as introducing a place with descriptive information. Instead, the proposed system, *Moodlog*, brings "mood of place" into an ordinary touring scheme, opening up a new aspect of touring, leading to a deeper understanding of a place for tourists.**

This research introduces three design principles for *Moodlog* which are: (1) Place Regarded as Human, (2) Experiencing a Great Diversity of Place, and (3) Touring in Mood of Place. The basic idea of the work is we treating a place as a human being to communicate with the tourists. Specifically, *Moodlog* collects "mood of place" by information tagged by people living and travelling there. People have unique sense of place, which is able to contribute to the place by tagging their mood with digital media such as music, and photo and video taken there. This makes the place have its own mood, turning a passive place to be active as a human. Expressing the mood of place to a tourist's first visiting is just like the place being a human talking about its feeling and the stories it experienced to the tourist. Notably, the place is considered with multiple personalities because tourists have distinct feelings to the same place. Experiencing each personality of the place is just like talking to many people.

For mood representation, music, color, photos, and videos are used to create a meaningful atmosphere for the user to easily get immersed in mood of place. *Moodlog* is implemented with a location-aware orientation-aware camera PDA held by the user during a tour. Additionally, a panorama-based user interface is introduced to help the user interact with the physical environment and the virtual memory of the place. A preliminary study for the system deploying in a university campus shows that the participants are interested in the new touring experience.

***Index Terms*— affective computing, locative media, location-aware Technology, location-based touring, panorama, psycogeography**

I. INTRODUCTION

AS there are more and more people traveling around the world, it is necessary to have guidance for places or locations to help the travelers get to discover more. Traditional guidance or touring systems are normally introducing the outer layer of the places, such as history, most of them focus on descriptive information of the places, but merely talk about inner layers. Inner layers such as culture, and daily experiences, and activities of human and places, are also important and should be taken into account.

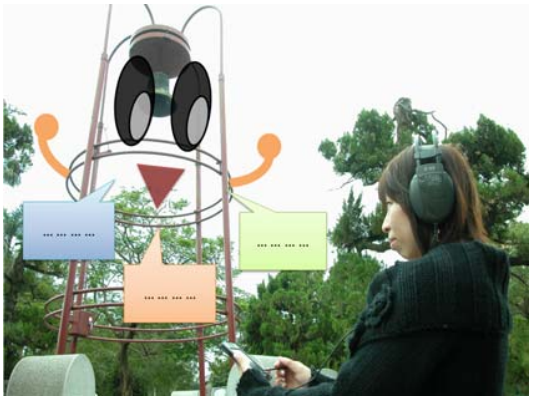

Fig. 1. An illustration of the concept "Touring in mood of place"

A touring system should consider the interactions between the tourists and the touring places. We discovered that having the chance of linking tourists and places in a cultural way would help the tourists generate associated memories within the place. Locations no longer have to contain nothing but buildings or landscapes, tourists are not merely spectators in places anymore. People have unique sense of place, which is able to contribute to the place. This makes the place have its own mood, turning a passive place to be active as a human. Expressing the mood of place to a tourist's first visiting can be just like the place being a human talking about its feeling and the stories it experienced to the tourists, as the conceptual illustration shown in Figure 1.

In this work, we develop a touring system, Moodlog, towards presenting common memories and human affections of a place, which are able to bring out the tourist's place identification to the place, and to further help the tourist obtain deeper understandings of the place. Moodlog is implemented with a location-aware orientation-aware camera PDA held by the user during a tour. For representing mood of place, several elements like music, color, photos, and videos are used to create a meaningful atmosphere during a touring. *Moodlog* allows all users to augment their feelings to the visited place by tagging their mood with mood tags, and digital media such as music, and photo and video taken there. Through tagging process, affections and memories

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through different space and time can be aggregated and extended to an extraordinary touring experience. With the new touring scheme, the users affect places or are affected by places in a close, mutual interaction.

This paper starts by revealing a new concept of "place regarded as human" for touring systems to open up a new thinking for touring. We then propose *Moodlog* as a novel touring system to improving touring experience by collecting place mood from tourists, and by creating a meaningful atmosphere to represent the mood. Section 2 provides pointers to related research, including reviews on the strength and weakness of similar projects. Section 3 discusses the design principles for *Moodlog* to meet our several expectations. Section 4 describes the system implementation including two modes for mood representation. Section 5 presents a preliminary study of the system and the analysis on users' feedbacks, followed by the conclusion and future work in Section 6.

II. Related work

To provide a tourist touring information has been investigated for decades. For the purpose, paper guidebook and personal audio guidance are two traditional ways to guide a newcomer, although the user has to manually map information on the guidebook to what she/he is seeing or to follow a static route defined by an audio narration. With the advances in ubiquitous computing, a location-aware guiding system enhances the traditional ways by popping up information adaptively according to the user's position [1]. Since then the user has no need to do much manual work and would not restrict to pre-defined routes.

While technology helps delivering touring information in an easier way, most touring systems mainly focus on introducing outer level of a place. One can easily see this from the touring services provided by a commercial in-vehicle GPS navigation system. In this work, we are looking for some other ways to represent the inner aspects of a place, offering more deeply understand of the place for the tourists. What we are trying to do for touring is not to merely provide some famous spots of a place that tourists must see, but to present the mood of the place, an inner level of representation.

Soundwalk [2] is a commercial CD designed for touring a city by walk. The CD is prepared by local famous people. During a touring, the user listens to the CD, and walks from a given spot in the city. The speaker in the CD assumes that you are following his every indication, and start talking about the place you should have walked by, what people think, and why people love the place. The speaker tries to tell the listener every perspective of the place, which we think is a good example of inner touring. However the stories of the place are only contributed by a few speakers, so only limited perspectives of the place can be revealed. Besides, SoundWalk with a pre-recorded CD only provide fixed routes, which are impossible customized for its users.

Murmur [3] is a documentary oral history project that records stories and memories told about specific geographic locations. Murmur collects place memory using pre-installed recording devices in given locations for documentary, while our system collects place memory using location-aware handhelds for touring.

Patholog [4] is a location-aware mobile-blogging system which allows the user to leave a story about the path they have travelled. Patholog focuses on improving social connections between people living in the same place and uses weblog to create more direct dialogue between readers and writers. On the other hand, that the weblog allows user to read anywhere causes the lack of linkage between location and media. In comparison, our work focuses on the communication between tourists and the place, and to further help a newcomer understand the place real time.

Location33 [5] proposed a new type of music production which mixes songs and stories stored in some given positions based on the user's location, creating new type of musical experience for the user while she/he is travelling a city. Location33 gives a good representation of a place via the atmosphere created by music generated on the user's travelling. However the songs and stories associating to a position in Location33 are pre-defined.

III. Design Principles

A. Place Regarded as Human

In a traditional touring system, the world is generally expressed by geographical names, making the physical world the same to everyone. Geographical names are necessary to distinguish different locations, but sometimes they are meaningless for a tourist's first visiting. Instead of a name of a location given long time ago, we consider the feelings of people living and travelling there are more important for expressing current state of the location. In another word, a location can be more meaningful to individuals when it is attached with memories, experiences, and affections human beings. For more specific, a location with human affections turns to be a place. In this point of view, a place is regarded as a human, which creates a brand new view of the physical world for a touring system.

A plenty of researches in field of Psycogeography have addressed why people have different feelings about the

world. Several of them are listed below to give the thinking of treating a location as a place, and further to support the basic idea of the proposed touring system regarding a place as a human: (1) Harrison [6] mentioned the difference between the term "space" and "place". In his explanation, space is the structure of the world; it is a three-dimensional environment, in which objects and events occur and have relative positions and directions. A place, at the base of previous definition, is a space invested with understandings of behavioral appropriateness, cultural expectations, and so forth. (2) [7] and [8] further emphasized the term "place" and its deeply-etched social and historical meanings. A place is considered including the people's life experiences there. Besides, (3) Bakhtin [9] gives another explanation started in human's view through dialogism. His research claimed that each person organizes the world through his unique experiences. As a result, individuals own "unique sense of place" for their different cognitive models. Based on these discussions, it can be concluded that a place get meaningful when attaching the location with human affections. The conclusion also arises the idea of our work to bring in "mood of place" collected from unique expressions of the place from individuals into a touring system, leading to a deeper level of touring for tourists.

Tagging technique is successful in giving meanings to a virtual object. People turn space into place by tagging meanings on it and sublimate the meanings into "a sense of place" [10]. One can see the power of people tagging in web 2.0 sites such as Flickr, where people upload and tag the photos to the website, attaching meanings to digital archives. These photos can further used to tag on map, attaching meanings to a location of the map. With the support of location-aware technology, tags for places can be more convenient utilized and deployed while a tourist is on his travelling.

In this work, *Moodlog* collects "mood of place" by information tagged by people living or travelling there. People have unique sense of place, which is able to contribute to the place by tagging their mood and digital media such as music, photo, and video over there. This makes the place have its own mood, turning a passive place to be active as a human. Expressing the mood of place to a tourist's first visiting is just like the place being a human talking about its feeling and the stories it experienced to the tourist.

B. Experiencing a Great Diversity of Place

As we are collecting "mood of place" from people's travelling there, the collective moods can be very diverse, constituting inconsistent expressions of the place. Instead of fusing these distinct moods into a consistent one, we prefer to preserve all of them in order to express diversity of a place. We think this is interesting in that the diversity can not only be helpful to discover multitudes of a place, but can help a tourist to experience different faces of the place. By gathering experiences in a place, we could combine the individuals' worlds together, which opens up a new conversational space among the individuals who had been travelling there at different time. These people with their unique feels contribute different moods to our system. Such that the place is receiving conflict affections and generates multiple personalities. The different backgrounds between the tourists and the locals bring to cultural fusions, and are able to reveal different perspectives of a place. This process is accrual and is able to discover the major culture, secondary cultural, third culture of a place. As a result, the tourist is able to experience distinct personalities of the place.

Additionally, the gathering of distinct moods is able to bring out the tourist's past memory. The tourist can feel stronger when he has a unique feeling about a place, and realizes there were other people having feelings alike. This is the tourist has his own feeling at first, and then looks for support from others who had experienced the same way there. In another side, the mood presented by the place can also help recall the tourist's memory. That is the tourist first receives "mood of place" from *Moodlog*, which helps the tourist further retrieve similar experiences from past memory.

In summary, *Moodlog* can provide touring routes in different moods. The user is allowed to choose a route in a preferred mood or can take his time experiencing every personality of places in the route. Additionally, *Moodlog* can also suggest a must-see personality of a place during the touring, such that the tourists are guided in a route with mixed mood composition to meet many people. During a tour, the tourist might change his mood to switch to another route. The "mood of place" is dynamically influenced by different people travelling there at different time. In this sense, the route becomes infinite.

C. Touring in Mood of Place

Mood is generally considered as an abstract concept, to finely represent mood in a media way is still challenging. In *Moodlog*, we apply elements including music, color, photo and video for mood representation. Music and color are to create an atmosphere representing mood of a place,

while photo and video are to give clear meanings for the atmosphere.

Intuitively, music and color have connections to mood as indicated in several related researches [11]. Music is thought of a way to create a space of perception and embodiment [12], as though it is untouchable, people that listens to music wearing headphones can easily immersive in the atmosphere created by music. In *Moodlog*, music is used to generate an independent space for the listener with immersive feelings. Besides, mood also has connection with color. For example, the color "red", is frequently related to the mood "exuberance". *Moodlog* provides an interface allowing the user tag their mood by simply choosing a color.

Although music and color are good at representing the concept of mood, they cannot offer clear meanings of the mood. A happy mood can be generated by diverse activities, and vice versa. For example, some people are happy for graduation, but some feel sad. Photo and video

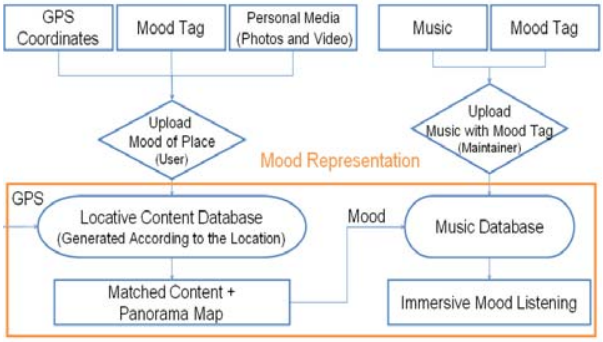
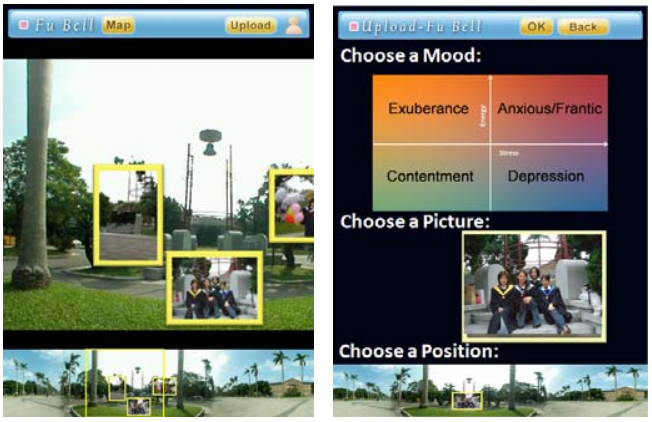


Fig. 2. System architecture of Moodlog

can give meanings to a mood tagged by the tourist. In *Moodlog*, the tourists can tag their mood via a color. The tourists can also give their mood some specific meanings by uploading a photo, a music file, or a video. The categories of mood model are classified according with the theory of psychological filed [13], [14] that give a strong meaningful support to technology. While representing mood, *Moodlog* will aggregate these supportive media into a panorama shown on the user's handheld device.

IV. System Description

The system is deployed on a camera PDA integrated with a GPS receiver and an orientation sensor. The GPS receiver is to provide the location of the user. The orientation sensor determines which direction the user is facing, and automatically aligns the panorama view with the real world. According to the user's location, the panorama of the place is displayed on the handheld, showing the external appearance of the place. While the



(a) (b)

Fig. 3. The panorama-based user interface (a)Mood Display interface, (b)Upload user interface.

user operating with the handheld, we constantly update the partial view of the panorama on the handheld, according to the user's orientation [15].

The unique part in this work is that we present the mood of place to the user. By doing this, the place is no longer a lifeless object. It becomes a person telling us his stories and memories. The system architecture is shown in Figure 2. We present the mood by playing the music and displaying the place's video and photos taken at different time (The part marked by the orange rectangle in Figure 2). The acoustic-oriented music creates an independent immersive space separated from the physical environment and the visual-oriented video and photos make the user have a sense of place identification. If the user wants to contribute to the place, we also provide the interface allowing the user to upload new photos and videos with mood tag. (The top left part in Figure 2.) The details are described in the following sections.

A. Mood Representation

This section is shown in the orange rectangle in Figure 2. As the user arrives at the place, the GPS indicates the location of the user. We then retrieve the corresponding panorama for the user and also the major mood of the place. The major mood is the mood that most people feel about the place and is as the major personality of the place. According to the major mood, we then retrieve the consistent songs from the music database. As a result, the user can feel the mood of this place through the music, photos and video presented by our system as shown in Figure 3(a). If the user wants to know more about the place, he can experience other stories and memories with different mood by selecting through the button on the top-right corner of Figure 3(a). This allows the user to have more understanding about various activities of the past visitors around the place by understanding other

personalities of place.

Music mode to Present an Immersive Space

We present the mood of place by music since the music creates an independent space from the real world, which generates an immersive space for the user. To present the mood properly, we must select right songs corresponding to the mood. A music database is constructed with each song labeled with the mood that people feel while listening to it (The top right part in Figure 2.) Machine learning techniques recognizing the mood of the music [16], [17] can be adopted to construct the music database. A set of songs are labeled manually by the maintainer at the beginning. With this set of labeled songs, music-mood recognition automatically identifies the mood presented by incoming new songs. Thus, we are able to add new songs automatically to the database without labeling manually again. This update is accomplished by the system maintainer periodically.

Photos and Video Mode to Present Place Identification

The photos and video show the real events that people experienced under the mood at this place in a visible way (The bottom left part in Figure 2.) This provides a sense of place identification since user can easily imagine what may happen as he is here at some other time. We augment the video and photos onto the place's panorama which roughly indicates the spot where the event happened. The concrete and visualized data provide an intuitive and direct way by which user can easily observe and imagine the circumstance of the event. The video even provide the live data and the ambient sound of the place, which presents the event entirely and thoroughly.

B. Interaction with the Place

The user can make interaction with this place by updating his photos and videos with mood to the database to enrich the memories and events of this place. The user can update his photos by pressing the "Upload" button in Figure 3(a). A user interface shown in Figure 3(b) is displayed. User could select his photo, label its mood tag and indicate where it should be embedded in the panorama. With this method, the user make changes to the mood of this place by contribute his feeling about this place and share his photos and videos with others. As a result, the mood of this place dynamically changes and grows as more people visit here. More affections and memories can be collected as more people visit this place, which enrich our system database so we can provide more information to upcoming users. That reveals the common memory of place of related visitors.

V. EXPERIMENTS

A. Scenario

We set up a scenario for this system in our campus, National Taiwan University, Taiwan (NTU). We mainly focus on several favorable spots from "NTU Campus 12 Scenes". The scenes are chosen for two main reasons: 1) students are frequently gathering there, and 2) the relationship between affections and memories in these places can be easily concatenated. In the preliminary study of the system, two testers are participated, one who studies in NTU, representing a person familiar with the surroundings, while the other has never been to NTU. Both testers are familiar with PDA devices. An initialization of this system is built for the testers, which includes a few pictures and videos for each popular spot and several moods (personalities) of each spot are given according characteristics of the place.

We spilt the scenario into two stages. In the first stage "Exploring", the user roams in the campus freely, and discovers places with the help of the system. "Sharing" represents the second stage. Once the user finds a relaxing place which inspires him generating feelings, he can take pictures or videos and upload them with mood tag to the server immediately. We record user behaviors whiling using the system. Here are two examples.

Mavis is touring in "Lu Ming Square", she has heard that there are many activities and events in this place, but she didn't see many people around because it was late at night. She uses the device and sees pictures that other users have shared with. She finds many interesting pictures taken in a hot summer where all people in shirt-sleeves by with panorama views. She also plays a video clip which a band was performing in the square. She moves the device to let the screen fits the real environment and feels like turn the clock back.

In a cozy afternoon in winter, Mavis walks through famous spot in NTU, called "Drunken Moon Lake", she feels the wind breezing on the lake and birdcalls in the tress. The amenity of the surroundings attracts Mavis pretty much, so she take a photo of herself right besides the lake She then uploads this photo with an elegant lady standing beside the lake, and change the mood to be closer to "serene" feeling (associated with color of green). She feels very exciting by sharing what she feels about the environment and feels connected to the place that the mood of place is influenced by her mood.

B. Discussion

By doing a small scenario on this system with initial pre-built information with analysis, we found out that positive feedbacks are mostly revealed from most parts of

this system. Users think that interacting with the system is comfortable to immersive in the memory of place the whole time. It is also mentioned that it is fun to see or hear others' experiences in the same place but different time spaces that also makes him recall his memory. One even says, "It feels a lot closer to places during the tour". However, there are still few negative feedbacks, such as no professional guidance for spot, which confuses a user to know well-defined and public information of the city.

Also, when selecting the color, the user is not familiar with what colors stand for. We resolved this defect by adding semantic description of moods, which produced a greater satisfactory on our system. Since the research about effects of color on emotions [18], color evidenced strong and consistent effects on emotion with formulated regression equations.

VI. CONCLUSION

In this work, a novel touring system named *Moodlog* is developed toward representing the inner mood of place for the tourists. The basic idea of *Moodlog* is to regard place as human. People have unique sense of place, which can be contributed to the place. By gathering experiences from the tourists in a place, *Moodlog* combined the worlds together conceived by different individuals. These people with their unique feels to the place contribute different moods, fostering multiple personalities of the place. The different backgrounds between the tourists and the locals are able to reveal different perspectives of a place. As a result, experiencing each personality of the place is just like talking to many people met there.

In the experiment, we have conducted a preliminary study for the system. The study reveals an exciting start of the research that originated many positive responses of the participants. Currently, the user is only allowed to contribute a place through mood tag, music, photos and videos. In the future, we would like to include voice clips record by the user. The voice clip can be a statement about the user's feeling, or ambient sound record of the place, which can represent the mood of place more sophisticatedly. These user-contributions can only be significant if user can be fully trusted of uploading proper files with valid mood tags. In the system, the user has to manually browse through different moods to experience every perspective of a place. It is possible to embed biometric sensors in the handheld, estimating the user's happiness while the user holding the handheld. Therefore the system can suggest a major perspective in the initial, and then to stay in the same perspective or to jump to opposite perspective according to the user's bio-feedbacks. Additionally, advanced user study should be performed to justify the capability of *Moodlog;* a long-term testing is also required in the future to observe the interaction between tourists and places, and how the interaction influences the mood of place.

VII. ACKNOWLEDGMENTS

This work was supported in part by the Excellent Research Projects of National Taiwan University, under grant 95R0062-AE00-02.

REFERENCES

[1] G. Lane, "Urban Tapestries: wireless networking, public authoring and social knowledge," in Proceedings of the Forth Wireless World Conference, Jul. 17-18, 2003, submitted for publication.
[2] Oversampling, INC. Soundwalk NYC., Jan., Retrieved from http://www.soundwalk.com, 2005.
[3] S. Jose, "MURMUR." Retrieved from http://murmurtoronto.ca/, private communication.
[4] W. Carter, S. Fisher, T. Furmanski, K. Macdonald, T. Millican, "Patholog: creating location-based web logs," in Proceedings of the Tenth International Conference on Virtual Systems and Multimedia, Ogaki City, Japan, Nov. 17-19, 2004, submitted for publication.
[5] W. Carter, S. L. Liu, "Location33: a mobile musical," in Proceedings of the International Conference on New Interfaces for Musical Expression, Vancouver, BC, Canada, May 26-28, 2005, submitted for publication.
[6] S. Harrison, P. Dourish, "Re-plcae-ing space: the roles of place and space in collaborative systems," in Proceedings of the ACM Conference on Computer-Supported Cooperative Work, Boston, MA, 1996, submitted for publication.
[7] J. Jacobs, "The death and life of great American cities," Random house, New York, 1961.
[8] C. Alexander, "The timeless way of building," Oxford University Press, New York, 1979, submitted for publication.
[9] M. Crang, N. Thrift (ed), "Thinking Space," Critical Geographies Series, Routledge, London and New York, article by Holloway, Julian and Kneale, J. M. Bakhtin, "Dialogics of Space.", 2002.
[10] T. Cresswell, "Place: a short introduction," Blackwell publishing, Australia, 2004.
[11] C. H. Chen, M. F. Weng, S. K. Jeng, and Y. Y. Chunag, "Emotion-based music visualization using photos", in Proceedings of The 14th International Multimedia Modeling Conference (MMM 2008), Kyoto, Japan, January 2008, submitted for publication.
[12] F. Dyson, M. A. Moster, D. MacLeod and Banff Centre for the Arts (ed), "When the ear is pierced," in Immersed in technology: Art and Virtual Environments, Mass: The MIT Press, Cambridge, pp. xxv, 339, 1996, submitted for publication.
[13] R. E. Thayer, "Two-dimensional view of tense and energetic arousal can be integrated into this two-dimensional space when viewed as 45° rotations of one another," 1989.
[14] J. A. Russell, "A circumplex model of affect," in Journal of Personality and Social Psychology: 39, 1161-1178, 1980, submitted for publication.
[15] L. W. Chan, Y. Y. Hsu, Y. P. Hung and J. Y. J. Hsu, "A Panorama-Based interface for interacting with the physical environment Using Orientation-Aware Handhelds," in Proceedings of the Seventh International Conference on Ubiquitous Computing, Tokyo, Japan, Sep 11-14, 2005, submitted for publication.
[16] Y. H. Yang, Y. C. Lin, Y. F. Su and H. H. Chen, "A Regression Approach to Music Emotion Recognition," in IEEE Transactions on Audio, Speech, and Language Processing, Feb. 2008, submitted for publication.
[17] J. Kim and E. Andre, "Emotion recognition based on physiological changes in music listening," in IEEE Transactions on Pattern Analysis and Machine Intelligence, 2008, submitted for publication.
[18] P. Valdez, A. Mehrabian, "Effects of color on emotions," in Journal of Experimental Psychology: General, 1994, submitted for publication.