Using Digital Technology to Access And Store African Art

Gary Marsden, Katherine Malan & Edwin Blake

Collaborative Visual Computing Group,
Department of Computer Science,
University of Cape Town
+27 21 650 2666
[gaz|kath|edwin]@cs.uct.ac.za

ABSTRACT

In this paper, we describe the challenges in creating, and providing access to, a database of African cultural artifacts. The submission is targeted at the section 2 in the consortium – how HCI research is being used to support the African Renaissance.

Keywords

Culture preservation, mobile interaction, dynamic queries.

INTRODUCTION

Africa is a continent rich in culture. Within the Department of Computer Science at the University of Cape Town (UCT) is the CAMA (Contemporary African Music and Art Archive) project(www.cama.org.za), whose aim is to digitally capture as much contemporary African culture as possible. To this end CAMA has installed computers and digital video equipment at seven key sites throughout Africa (Mozambique, Ethiopia, Sudan, Kenya, Ghana, Senegal, Mali and South Africa). Besides capturing this material, there still remain the problems of storing and providing access to it. We believe the HCI has a key role to play in making sure that material in this, and other archives, is made available to as wide an audience as possible.

CAPTURE

The capture of cultural artifacts is largely taken care of by Mini-DV camcorder, digital camera and DAT recorder linked to a Power Macintosh. We have recordings of music, dance, story telling, painting etc. One area for concern is in the capture of sculpture. At present we have built a turntable system linked to a digital camera. Images are then merged using QuickTime VR to present the illusion of a three-dimensional model. We have also built a software which is able to re-construct true three-dimensional models of artifacts from these images. Currently our turntable system is built from the rear wheel of a Peugeot (a common

car throughout Africa) as no commercially available turntables were able to bare the weight of large stone sculptures. We will been negotiating the donation of a high resolution laser scanner and have also been working toward using the low resolution scanner at the university of Fort-Hare.

STORAGE

The storage and cataloguing of African art has presented us with two unique problems.

The first of these is lack of any agreed universal classification scheme – there is no equivalent of, say, an "impressionist" period into which art may be classified. Whilst a lack of classifications is frustrating at present, it underlines how useful and necessary this type of project is in investigating and furthering understanding of African art.

The second problem we face is in the uncertainty attached to African cultural artifacts. If an artifact is to be stored, then it is important to know where and when it was created. Quite often, however, an artifact may be of uncertain origin or from an uncertain period. Furthermore, the uncertainty itself is of a nature not found in artifacts from, say, Europe. Usually uncertain information is fuzzy in nature, meaning that there is some form of normal distribution of certainty: An artifact may date from 1650 to 1700, but most likely it dates from 1675. For African artifacts we have encountered as part of the CAMA project, the date can be given as "19th Century" and it is as equally likely to have originated in 1800 as 1899! This kind of uncertainty is known as probabilistic uncertainty (for more on the distinction between fuzzy and probabilistic uncertainty, see Fisher[2] and Burrough[1]).

Besides the issue of date uncertainty, there is also the issue of geographic uncertainty. For example, there are artifacts in European museums which are simply labeled as "from Africa" – the artifact could be from anywhere in the entire continent. We have had to develop data models which cope with this uncertainty, whilst preserving as much information is available.

RERIEVAL

One of the goals of our work is to "Reflect Africa back to Africa." The work we have carried out to date with CAMA

suggests that there is little communication between artists within Africa. Our system should therefore support such communication. In order to do this, it should be usable by the artists who, most likely, have no experience in using a computer.

Besides the constraint of novice users, our system also has to cope with providing some way of querying the uncertain data in our database. This places a huge constraint on our design space.

One approach of database querying which has been used successfully with novice users is "dynamic querying."[3] Dynamic query systems allow users to specify queries graphically (i.e. using GUI widgets) and have the results of the query displayed immediately in an output area. For our system, we had to develop some way of including uncertain data in the querying and display mechanism, something which had never been attempted before.

Our initial system used a map, where uncertain objects were placed randomly somewhere within the borders of where the object could have originated. Users tests proved this to be an unsuccessful approach as users assumed that the point on the map was the actual location of the artifact (even though they had been told objects were randomly placed).

Instead, we have developed a visual query system based around a time line. Objects are represented on the time line as either a dot, if an exact time is known, or a line, if the time is uncertain (obviously the length of the line depicts the length of the period in which the object may have been created).

PRESENTATION
Having populated the database and built a query system, the problem remained of how to display data. We have developed three systems – virtual galleries – in which to display the artifacts selected from the query. The first gallery is a collection of HTML web pages. The second is a virtual environment consisting of a collection of rondavels (which housed the artifacts) laid out in a regular pattern. The final gallery was based on Great Zimbabwe – an irregular environment with artifacts placed randomly within the walls. From user testing we discovered that gallery visitors were more likely to read about exhibits in the HTML environment; that the village scene was "fun" and easy to navigate; that the Great Zimbabwe scene was distracting and that users made frequent navigation errors.

ACCESS
Having built a complete system, the problem remains of how to disseminate it to those who would find it most useful. Currently internet access in Africa is limited by poor telecommunications infrastructure. One area of hope, however, lies in cellular technology. Currently 22%[4] of South Africans have a cellular handset. We therefore are investigating the possibility of accessing these collections via cellular handsets.

To date, we have produced a system which allows a WML handset to access and retrieve documents from an HTML based digital library. Our system acts as a proxy server which translates WML queries to HTML and HTML results back to WML. The system uses an independent XML language, allowing us to deliver content to the handset in the most appropriate form (e.g. cHTML).

As the capabilities of these handsets improve (e.g. Multi-media Messaging System), we are extending our system to better cope with the types of multi-media we are using to populate the CAMA collection.

CONCLUSION
We believe that creating an digital archive of African artifacts is essential. It will serve not only as a store, but also as a way in which some of the African artwork stored in foreign museums can at least be virtually repatriated. It will also serve as an educational tool for sharing artwork across the continent. It is therefore essential that we work hard at the interface of this system to understand how to make it useful to the greatest number of people. We have already started this process by building prototypes described in this paper, but our studies have so far been limited to South Africa alone.

It is also essential that we understand the environment in which African art is created – hence the need to build systems which present uncertain data in a meaningful way. Africa also has unique problems in distribution of information, which also makes it essential that we consider interfaces for the widest possible range of distribution media.

Finally, there is a great potential here for African to present its rich culture to the rest of the world and to recapture (in digital form at least) those artifacts which are currently housed in museums outside our borders.

ACKNOWLEDGMENTS

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