2013 International Conference on Virtual and Augmented Reality in Education

The New Dimension in a Calendar: The Use of Different Senses and Augmented Reality Apps.

Karle Olalde[a]*, Imanol Guesalaga [b]

[a]Dpto. Expresión Gráfica y Proyectos de Ingeniería, Escuela de Ingenieria de Vitoria-Gasteiz, University of Basque Country, UPV/EHU, c/ Nieves Cano 12, Vitoria-Gasteiz. Spain.
[b]CEO, Otzarreta Comunicación, Avd. Bizkaia, 31, 20800, Zarautz, Gipuzkoa. Spain

Abstract

Augmented reality has arrived, bringing infinite possibilities. This communication tool is applicable to any market or product and is key to understanding the new dimension that print communication is taking on. Augmented reality is capable of recreating a whole virtual universe from a print, to the point that in the not-sodistant , future, printing and augmented reality will not have reason to exist without each other. We are at a turning point, where how we communicate is changing, growing, evolving and opening up new channels of expression. Through the augmented reality applications, print communication takes on a new dimension, grows and is enriched to generate a virtual universe aimed at covering new needs in infinite areas and markets. Two parallel worlds, digital communication and print communication that now converge and are mutually enriched. This year our calendar does an about turn to offer something totally new. Month by month we have conceived a unique calendar so that each print is an exclusive and surprising experience. The prints contain different icons that tell us about new printing experiences. These icons show us whether the print is treated with augmented reality or with different textured finishes, which take printing to another dimension, interacting with our senses. Touch: Explore and discover the print, where you see this icon. Experience the possibilities we can offer through touch. SIGHT: An exclusive example of a textured finish that glows in the dark. SMELL: Find the textured surface and gently rub your finger on it. The print gives off a pleasant smell of grass.

*Keywords:*Augmented reality; calendar; senses; photography.

* Corresponding author. Tel.: +34 945 01 41 38
E-mail address: karle.olalde@ehu.es

1. Introduction

Augmented reality (AR) has arrived, bringing infinite possibilities in many areas (education, marketing, engineering and others). This communication tool is applicable to any market or product and is key to understanding the new dimension that print communication is taking on. Augmented reality is capable of recreating a whole virtual universe from a print, to the point that in the not-so distant, future, printing and augmented reality will not have reason to exist without each other. We are at a turning point, where how we communicate is changing, growing, evolving and opening up new channels of expression.

Augmented reality techniques allow manufacturing, inventing, reconstructing scenes that bring us closer to a virtual world where a user can interact with their environment. This makes the interaction is much richer products and open new possibilities up to now no no possible with classical person-product interaction.

Through the augmented reality applications, print communication takes on a new dimension, grows and is enriched to generate a virtual universe aimed at covering new needs in infinite areas and markets. Two parallel worlds, digital communication and print communication that now converge and are mutually enriched.

1.1. The Idea

Japan, country of the past, present and future a place where tradition and technology coexist, giving rise to a culture unique in the world. On one hand there is the traditional Japan, where time seems to stand still and, on the other, there is the technological Japan where the pace is frenetic. The existence of one extreme cannot be explained without the existence of the other. We hope to reflect these two worlds in the calendar [1], but with different way through AR. For this reason, we show time as a relative element, which can be measured and enjoyed in a very personal way. This year, our year, has the month of March as a starting point and bears a distinctive trait that makes it interactive: Augmented Reality [2]. With this tool, paper-based communication takes on another much more current and technological dimension at Otzarreta we hope you will join us in this experience and find out about everything.

1.2. Augmented reality

Augmented reality is a live, direct or indirect, view of a physical, real-world environment whose elements are augmented (or supplemented) by computer-generated sensory input such as sound, video, graphics or GPS data. It is related to a more general concept called mediated reality, in which a view of reality is modified (possibly even diminished rather than augmented) by a computer. As a result, the technology functions by enhancing one's current perception of reality. By contrast, virtual reality replaces the real world with a simulated one. With the help of advanced AR technology (e.g. adding computer vision and object recognition) the information about the surrounding real world of the user becomes interactive and digitally manipulable. Artificial information about the environment and its objects can be overlaid on the real world.

Month by month we have conceived a unique calendar so that each print is an exclusive and surprising experience. The prints contain different icons that tell us about new printing experiences. These icons show us whether the print is treated with AR [2] or with different textured finishes, which take printing to another dimension, interacting with our sense.

1.3. Requirements

For AR, used in the calendar can be shown, is required to comply with different hardware specifications and therefore to continuation, shows which of them is compatible after downloading software from Google play, Itunes or from your www.otzarreta.com own web page (link1).

Compatible with iPhone 3GS, iPhone 4, iPhone 4S, iPhone 5, iPod touch (third generation), iPod touch (fourth generation), iPod touch (5th generation) and iPad. Requires iOS 4.0 or later. This app is optimized for iPhone 5.Android 2,2 or upper.

1.4. The calendar as a final product

Table 1 shows the four types of icons that accompany each photograph, ranging from the use of AR, the senses of touch, smell and dark florescent (link2).

Table 1. The graphics icons means

Graphic Icon	Description
	AUGMENTED REALITY: In the top right corner of this page we have placed a web address: www.otzarreta.com/app/. There you can download an application specially created to visualise the different effects, videos, movements, surprises, etc., contained in the prints with Augmented Reality. This application is available for Apple and Android. Once you have installed the app, activate it and place your smartphone or tablet opposite the print containing the icon and discover what it's hiding
	TOUCH Explore and discover the print, where you see this icon. Experience the possibilities we can offer through touch.
	SI GHT An exclusive example of a textured finish that glows in the dark
	SMELL Find the textured surface and gently rub your finger on it. The print gives off a pleasant smell of grass.

The first month is March, and you can use the AR, you can see the Fig.1, and show how is possible understand e.g. the risk of pollution (link 3) in the street and what of measures are the most appropiate.
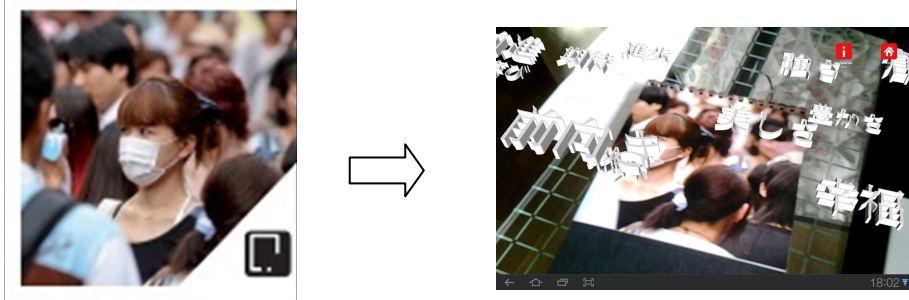
Fig. 1. Augmented information with animation texts

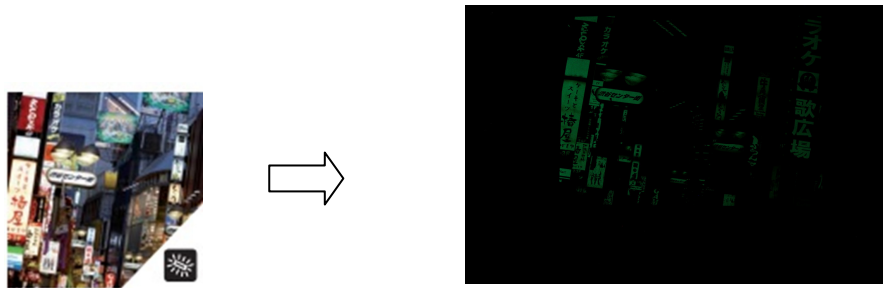In other month (April) Fig. 2, you can see the photography in the dark, trough fluorescent paint.

Fig. 2. Florecence

In the May month, Fig. 3, is possible see the panoramic 360ªof the Tokio city.using AR, like we were in a skyscraper in the city, enjoying a night panoramic view.

Fig. 3. Panoramic 360º

Another of the possibilities offered by the calendar is a sensory level interacts. Touching some of the photographs, you can feel the texture of the roads or the reeds, as well as smell the freshly cut grass. You can try to sense of **touch** and **smell** the glass in the photography (Fig.4).

Fig. 4. (a) Touch; (b) Smell

In July and august (Fig.5 y 6), you can appreciate different products, trough the AR and choose the point of view [3],or read the characteristic of product, playing the different buttons or options, you can change product and colo in natural scale.
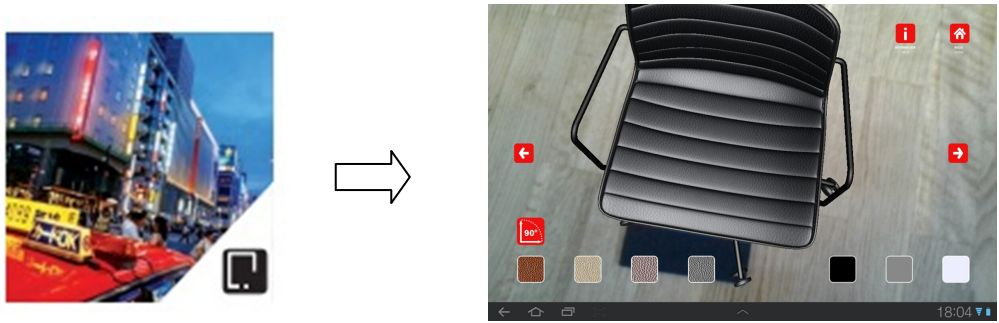

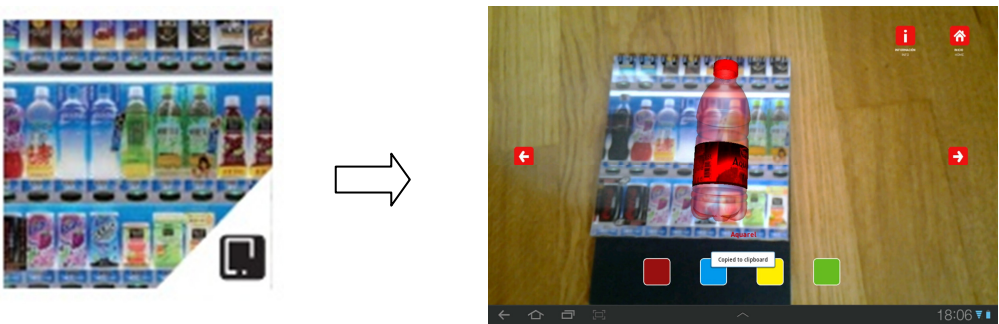Fig. 5. Chair escale 1:1, move, colour

Fig. 6. Refreshment

But the AR not only stays in view images in the dark but can hear sounds in 3D (soundround) of a metro station, which will vary as you move (Fig. 7).

Fig. 7. Sound in 3D

In the last month of the year,and in the fist of 2014 (Fig.8), you can see the animation for celebrate the new year with some fireworks and reverse countdown using the AR [3], It allows you see the name of a person and can make a more individualized calendar and interactive.

Fig. 8 Animation in 3D, and personal name

And for finish this experience (Fig. 9), you can see a video walking in the Zen church and peaceful atmosphere trough the AR [4], can also be used to produce moments of peace and relaxation.

Fig. 9. Video

2. Conclusions

AR until now has been used in the field of engineering and information technology.In short, this calendar aims that society gets closer to the AR, you become familiar with its use in a simple and understand its multiple capabilities in a fun applicative. Thus, if the company begins using AR in daily life, will gradually conceiving it as something standard and its use can be extended in a natural way, as extended use of computer or mobile.

This calendar, we can say that it is unusual, but a new concept and a reflection of all the advantages that the RA can offer daily life of people in various fields such as marketing, product selection, or even in the field of education[5].

One of those benefits is to combine the traditional image with AR.

This calendar combines in a simple job at first, the applicability of this technology into normal society. Not only to the field of engineering, computer science or technology, making available to all, the extent of its possibilities.

Importantly also, the possibilities for augmented reality in the field of engineering as well as in the industrial sector, as it can provide our customers with information much more realistic product,. and may be helpful for marketing and exhibition of new products to our potential customers.

Another advantage that is reflected in this calendar is access through the AR to websites with updated information of common interest, such as levels of pollution (as stated in this calendar), the weather forecast or other information in which the client is interested in your product appears.

In marketing can be applied to visualize the characteristics or properties of a product. Often, a final product can have multiple finishes to the customer can choose, however, due to space or economic, the producer has no physically available all possible products. The AR comes to effectively solve this problem with a simple technological device capable of reading augmented reality, the customer has in his hand the possibility of designing your taste go all the features of the final product until desired fit (in the calendar can be seen clearly in the example of the chair). And not only that, but also, especially in the field of interior design, could check with a single click how would the finished product in the particular place where you finally will be located.

It can also be very useful in marketing to sell products in vending machines, as shown on the calendar. Often, when we come to one of these machines we would like to see the features of the product before your purchase but, for obvious reasons, this is impossible. Augmented reality allows us to overcome this difficulty and enable customers to determine and compare products before buying.

Currently education is very common in the use of books or materials (blankets game, for example) that will allow the child to discover the characteristics of the things around him. These books or materials that are different drawings with different materials (cotton, wool, silk, velvet, raffia, hemp, etc..) That a child should play to get familiar with different tactile sensations. The same can be done with augmented reality, as shown in the calendar: Through a simple photograph, without the use of such materials, the child can access these tactile sensations but with the added advantage of having before he the real image of the object to be found in its context (and not a drawing reproduced with different materials as was done so far).

Also, Augmented Reality can offer an added advantage unthinkable so far in this type of educational material: access to the olfactory. While the child touches the image and is discovering the textures, his hand is imbued with the smell coming from the object in reality, so that the quality of learning that can be reached is much richer than that achieved with traditional materials.

On the other hand, it could also be applied to the field of education, but from another point of view: learning sounds. In one of the examples available on the calendar, you will discover in three dimensions the different sounds that we can find in a subway station. But the possibilities that this technology may offer in the field of education are innumerable possible to know the actual sound in three dimensions that can get to find in any situation or environment.

In short, with this calendar is to see in a natural way, the coupling between the traditional and the new, with a simple application and easy to understand by all kinds of public and assume time we do see many of the possibilities that exist in this new field of technology .

3. Online license

All authors must Transfer the Online license before the article can be published. This transfer agreement enables Elsevier to protect the copyrighted material for the authors, but does not relinquish the authors' proprietary rights. The copyright transfer covers the exclusive rights to reproduce and distribute the article, including reprints, photographic reproductions, microfilm or any other reproductions of similar nature and translations. Authors are responsible for obtaining from the copyright holder permission to reproduce any figures for which copyright exists.

Acknowledgements

References

[1] Gimeno J, Morillo P, Orduña JM, Fernández M. A new AR authoring tool using depth maps for industrial procedures, *Computer in Industry* 2013; in press.
[2] Irizarry J, Gheisari M, Williams G, Walker BN. InfoSPOT: A mobile Augmented Reality method for accessing building information through a situation awareness approach, *Automation and Construction* 2012; **33**: 11-23.
[3] Kuo C, Jeng T, Yang I. An invisible head marker tracking system for indoor mobile augmented reality, *Automation and Construction* 2012; **33**: 104-115.
[4] Chen C, Chou Y. The development of augmented video system on postcards, Proceedings of SPIE - The International Society for Optical Engineering, vol. 8768.
[5] Bertolín, SC. Aplicación de realidad aumentada para dispositivos móviles destinada a espacios culturales (Doctoral dissertation). 2011.

E- reference_
link1: http://www.otzarreta.com/calendario-2013
link2: http://youtu.be/SA5_0C4flls
link3: http://www.reportajes.org/ecologia/niveles-de-contaminacion-en-espana/