

## User Identification using a Wireless MAC address

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**Abstract.** Every network interface has a unique pre-assigned identifier called MAC address. The MAC address makes possible to identify the manufacturer of every wireless device. In this paper, I propose a MAC interlocking method that improves substantial attention to the people passing by. According to the experiment, this method improved personal attention to the display device.

**Keywords:** MAC Address, MAC interlocking, Wireless Communication

### 1 Introduction

The connectivity of network and development of digital display broaden the spectrum of digital signage which allows the display to be established and to offer the mass media such as information, entertainment and commercials. Operation of the digital signage generally takes the form of client-server structure, and the server controls the clients for fare charging dependent to the usage of diverse commercials and media [1].

Most digital signage are designed to repeat some predefined operation without interaction such as screen touch, although some advanced models have limited function interactive with person who operate it. Thus, it does not offer individual recognition whom nearby it, and therefore, the personalized media or commercials are not offered for them [2].

As a result, some of digital signage are under a defunct operation against the installing and operating costs, thus the business is abandoned or withdrawn with a thing left alone. In this paper, I focused to improve this issue and propose a method that recognize every user by using their own MAC address of the wireless device, and to practice the profiling of those who approach to the digital display such as signage.

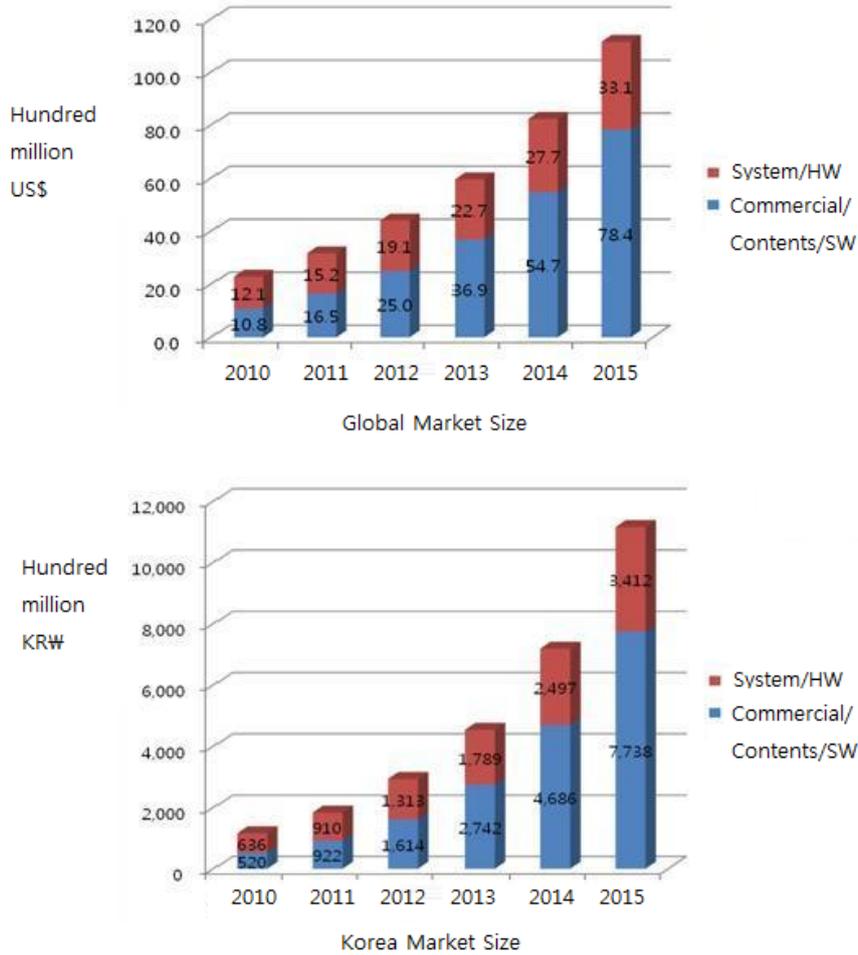
### 2 Current States of Digital Signage

In Korea, 2015, digital signage related companies are divided into the two categories, one is media companies and another is operation companies. For instances KT,

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This research was supported by Basic Science Research Program through the National Research Foundation (NRF) funded by the Ministry of Education (2013R1A1A2057967) of Korea.

Daum, and LG U+ are media companies, and CJ PowerCast and FingerTouch are operation companies.



**Fig. 1.** Korea and global digital signage revenue forecast [3]

In case of Korea and global markets, as Fig.1 shows the transition in market size of digital signage, it is exponentially increasing and the revenue forecast grows through every year [3].

In some cases, efficiency and effectiveness of digital signage are declined. For instance as shown in Fig. 2, most of signage by ‘Daum FingerTouch’ in Seoul metro stations are suspended and planned to dismantle [4]. The most significant reason of its decline is simple, the limitation of anonymous information-providing devices. In other words, digital signage basically takes the compulsory one-way form of commu-

nication, so-called 'Push type' and it is unsuitable for customer focused marketing advertisement in real-time.

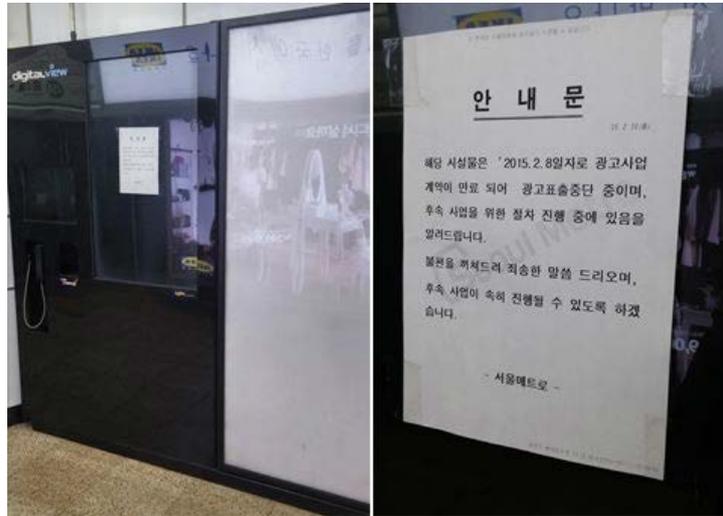


Fig. 2. Disabled signage

### 3 User Identification

In order to solve the defects of the signage described in prior section, nearby personalized information should be transferred to the digital signage without explicit operation. If the digital signage is able to distinguish the specific one from other anonymous persons, it might be appropriate to provide tailored information.

Wireless technology is the most accessible way to recognize people who approach to the signage. In particular, wireless LAN and Bluetooth are most suitable technologies for interact with a person within visually perceived range, and those technologies are operate on the ISM license-free frequency bands [5].

Every communication interface possesses its unique MAC address in data communications layer. This address is assigned by the IEEE and manufacturer. At least one MAC address is assigned to the each communication interface and the assigned address has a world-wide unique address [6]. Thus the MAC address is suit candidate that able to distinguish someone from another person.

### 4 Experiments

In this paper, the experiment to test the effect of identifying individuals mentioned

above is conducted by monitoring of the RSSI [7] and MAC, and a correlated content will be indicated on the display when a person approaches to it.

Table 1 summarizes the results of this experiment, in which noticed ratio was calculated, which is the ratio of the noticed count to passers-by. Display-without-MAC-sensing method repetitively played the predetermined contents without wireless intervention, while the MAC-interlocked-display played a correlated video depending on the vendor of the perceived device.

**Table 1.** Noticed ratio

	Display without MAC sensing	MAC interlocked display
Noticed count (> 3 sec)	13	223
Pass by count	168	56
Noticed ratio	7.1%	79.9%

## 5 Conclusions

In this paper, I proposed a method that reacts based on the wireless sensitivity and the MAC address. I conducted experiments how the identification of every person affects the users' attention and responses. The experimental result demonstrates the significant improvement of test subjects that the MAC interlocked display with wireless sensitivity has remarkable potential as an effective method to catch attention.

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