

How can we make the eyes for the Mobile AR services?

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Nowadays, many mobile AR applications and services are commercialized, and the technology backgrounds are somewhat different between them.

We, Olaworks Inc. believe that the core technology for the success of mobile AR service are “object recognition”, because we need to identify the target objects in camera preview to get the related information and/or attach new data.

The major object recognition technology elements in the current mobile AR applications are like follows:

- Sensor: Using GPS/AGPS/WPS, digital compass and accelerometer
- Marker: Recognizing 1/2D barcodes, characters or symbols
- Computer Vision: Image matching and/or image similarity with reference images

Above three major approaches have some limitations. For example, the sensor-based geo-AR applications have a critical problem to find the exact position and direction of the smart phone, because the resolution of each sensor has not accurate enough now.

And another big problem to solve is integrating each technology into one simple and unified mobile AR service. Currently there exist two approaches, one is providing a menu for the object categories such as street, book, CD and movie and guaranteeing over 90% recognition rate, and the other is a unified search by one simple and integrated camera preview interface with low recognition rate. Olaworks ScanSearch is an example of the former, and Google Goggles is the latter.

To overcome these problems, we suggest the future approaches for the integrated mobile AR services using the fusion of above technology elements. The followings are the examples:

- Real-time recognition of street by sensors and image matching using street-view
- Real-time recognition of objects by download reference images into handset adoptively
- Write some information to each object by real-time registration of reference image DB
- Image matching engine supports very large scale reference image DB to enlarge the number of searchable objects and to increase recognition rate
- The other computer vision technologies such as image/object similarity and face recognition

Our simple conclusions on the recognition technologies in mobile AR services are:

- Only one technology can NOT satisfy each user’s needs.
- There exist many ways to fuse technology elements, but the key is user experience.
- Sensors, markers such as 1/2D barcodes, computer vision technologies and even RFID will be harmonized to implement “the eyes of mobile AR services.”