Application Method for Streetview Database as Auxiliary Data to Estimate Mobile Device Users' Location

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Extended Abstract

As distribution rate of smart devices reaches 22% of global people as of 2013 (Heggestuen 2013), we live in the flood of diverse sensors. A smart device unveiled to public for the first time was 'Simon' which developed by IBM in 1993 (Sager 2012) and then Nokia and Apple received baton by releasing PDA and iPhone. From PDA to iPhone, a lot of mobile devices have equipped several sensors such as camera, GPS, magnetometer and so on for clear location based service and this multifaceted sensors suggested many kinds of mobile services in multiple fields from map to games. This flow of development of mobile devices is connected to the appearance of wearable devices such as Google Glass, Moverio and this have ultimately changed environment of sensor usage. That is, as smart devices have penetrated in our life, usage of sensors become fundamental option unlike past smartphone environment in which user can select whether they will use mobile sensors or not.

Meanwhile, various geographic information services for providing spatial database is being operated by a lot of organization. In case of South Korea, as public web service project for disseminating public database known as 'Government 3.0' has been leaded by each government division, spatial information such as DEM(Digital Elevation Model), land registration map can be also accessed through web network. 3Dimensional models which reflect shape of buildings on real world is included in this flow and these can be proper dataset for realizing location based service using images. Likewise, 'Streetview' services which can show image-based information of each street in a perspective view are provided by portal services. Basic interface of the service is that users can move their imaginary location on map

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service and they can get and catch the feature of the location where they are interested through the image information. Representatively, in case of Naver, Daum in South Korea, they construct huge image database of street and update once a year. Accordingly, each vendor can collect massive image data which reflect environmental information in a regular interval. These two kinds of distinctive trends can be great significance for smart devices users. The change of usage pattern of sensors with collecting vast image database enables camera which wasn't recognized as sensor to be used effectively.

In this project, various dataset mentioned previous paragraph was adopted to implement location based service using wearable devices. Whole flow can be divided into database and client layer. In database layer, we focused previous works in diverse field such as computer vision and image processing and try to establish methodology about how to apply the suggested dataset for location based service. In client layer, to realize environment of head mounted device released by general vendor, two smart devices which have modules for Bluetooth connection were adopted as wearable device and smart phone server. Through these component, we implement prototype for processing real time 3D images and deducting client's location.

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