香港地理信息系統學會
Hong Kong Geographic Information System Association
G.P.O. Box 8533, Hong Kong http://www.hkgisa.org.hk

Positioning Technology Update Seminar & Annual General Meeting 2006

Thursday 23 March 2006
Rm. CF305, Hong Kong Polytechnic University
(Followed by dinner at HKPU)

Programme:

6:00-6:30 pm **Development Trend of Ubiquitous Positioning Technologies**
By Dr. Esmond Mok
Professor
Department of Land Surveying and Geo-Informatics
The Hong Kong Polytechnic University

6:30-7:00 pm **Hong Kong Satellite Positioning Reference Station Network**
By Mr. Chan Siu Bun
Senior Land Surveyor
Lands Department

7:00-7:45 pm **Annual General Meeting**

Agenda:

1. Confirmation of Minutes of Last Meeting
2. Hon Secretary Report
3. Hon Treasurer Report
4. Any Other Business

7:45 - 10:00 pm **HKGISA Dinner**
Shing Hin Chinese Restaurant
14/F, Li Ka Shing Building
Hong Kong Polytechnic University
(Free for 2006 paid members, non-members $150)

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Brief of the Talk

Development Trend of Ubiquitous Positioning Technologies

Location-Based Services (LBS) has a wide spectrum of applications including fleet management, travel aids, location identification, emergency and vehicle navigation. Applications of LBS can be further extended if reliable and accurate 3-dimensional positional information of a mobile device can be determined seamlessly in both indoor and outdoor environments. This ideal has not yet been materialized in Hong Kong due to the fact that at present, LBS are largely based on satellite (GPS) and cellular network positioning techniques. However, GPS positioning is only effective in environments with good receiver-satellite visibility; but such condition usually cannot be met in dense high-rise and indoor environments. Moreover, current mobile positioning techniques can only provide geolocation in two dimensions, with accuracy level varies from the claimed less than 10 metres to as large as a few kilometres.

The European Galileo satellite navigation system mainly developed for civilian applications, is expected to be fully operational by 2010. The design of Galileo has already taken into account the future development of seemless indoor and outdoor positioning systems cater for various LBS applications. Having seen the importance of the synergy between navigation and communication services in support of a wide spectrum of LBS market demand, Navigation and Communication (Nav-Com) integration is in fact one of the architecture requirements in the design of Galileo. Additional data or information from the so-call Local Elements (LE) can be integrated into the Galileo core system through communications networks, to improve service performance. Suggested categories of LE include Location Based Services (cellular network positioning), Network Assisted Navigation (Assisted GPS) and Indoor Positioning. This fusion feature enables integration of GNSS (GPS, Galileo and GLONASS), cellular network positioning, and indoor positioning technologies.

In this presentation, the latest development of GNSS and the development trend for high accuracy, 3-dimensional seamless indoor and outdoor positioning by integrating GNSS; Wi-Fi and the emerging Ultra Wide Band (UWB) positioning technologies will be introduced.

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Hong Kong Satellite Positioning Reference Station Network

The Lands Department has recently established a Hong Kong Satellite Positioning Reference Station Network (SatRef) system with 12 active GPS reference stations located at different areas of Hong Kong. The system is a kind of Land-Based Augmentation System for satellite positioning applications. It collects GPS data on 7 x 24 basis, processes the data, and distributes the resulting positioning information to users through GSM and GPRS via Internet. The system would soon be launched for use this year. The services of the system include downloading of GPS RINEX data and Real-Time-Kinematic (RTK) and Network-RTK signals for high accuracy positioning for land and engineering survey works, and DGPS signals for mapping and navigation.

In this presentation, the speaker will introduce the above system, its positioning services and technology applied.