

Wireless Location Technology, Applications, and Services

Duration: 2 days

Prerequisites: Understanding of basic wireless principles

Objectives:

At the conclusion of the workshop the student will be able to:

- Understand principles of mobile positioning techniques
- Understand the process of mobile position data management and conversion to useful location information
- Identify the standards based LCS and LBS reference architecture, network element function and operation
- Identify and understand the operation of the major classes of wireless location applications and services
- Understand the interrelationship of presence and location data
- Understand how presence detection may occur and be used in applications
- Understand the role and importance of GIS in wireless location applications and services
- Understand the challenges and opportunities involved in deploying and operating wireless location technologies, applications, and services
- Identify the major initiative for standardization of wireless location infrastructure and capabilities
- Identify the major industry players and their strategies
- Identify the trends and future for wireless location technologies, applications, and services

Course Outline:

1. Course introduction
2. Introduction to location management in mobile communications networks
 - 2.1. Mobility management in cellular networks
 - 2.2. Radio access network operations
 - 2.3. Core network operations
3. Mobile positioning
 - 3.1. Positioning issues
 - 3.1.1. GPS
 - 3.1.2. Network based
 - 3.1.3. Handset based

- 3.2. Positioning techniques
 - 3.2.1. AOA
 - 3.2.2. TDOA
 - 3.2.3. E-OTD
 - 3.2.4. A-GPS
 - 3.2.5. Other techniques: TA, NMR, SIM Toolkit, etc.
- 3.3. Converting positioning data into useful location information
 - 3.3.1. Issues
 - 3.3.1.1. Availability of PDE and LCS enabled handsets
 - 3.3.1.2. Infrastructure and cost impacts
 - 3.3.1.3. Location data management
 - 3.3.2. Application QoS requirements
- 4. Mobile location network infrastructure
 - 4.1. GSM LCS reference architecture
 - 4.2. ANSI LBS reference architecture
- 5. Wireless location applications
 - 5.1. Emergency services
 - 5.2. Location based information
 - 5.3. Location based charging and billing
 - 5.4. Location based mobile games
 - 5.5. Location based messaging
 - 5.6. Tracking, telemetry and telematics applications
 - 5.7. WLAN and PAN based applications
- 6. Presence and location services
 - 6.1. Obtaining presence information from the network
 - 6.2. The combined use of presence and location data for services
 - 6.2.1. Case study: Mobile instant messaging
 - 6.2.2. Case study: Intelligent location based information services
- 7. Geographic Information Systems (GIS)
 - 7.1. Data representation
 - 7.1.1. Vector vs. raster data
 - 7.1.2. Geo-coding
 - 7.1.3. Coordinate systems
 - 7.1.3.1. WGS-84
 - 7.1.3.2. Coordinate transformation
 - 7.2. Provisioning and data administration
 - 7.3. GIS and processing of location data
- 8. Challenges to introduction of mobile location services
 - 8.1. Privacy issues and regulation
 - 8.2. Interoperability issues
 - 8.3. Integration with 2.5G and 3G networks
 - 8.4. Integration with prepay
 - 8.5. Implementation issues
- 9. Mobile location standardization efforts
 - 9.1. LIF
 - 9.2. OMA
 - 9.3. OpenLS
 - 9.4. MAGIC Service
 - 9.5. WLIA
- 10. Industry players and direction of industry
 - 10.1. Major players

- 10.1.1. AutoDesk
- 10.1.2. Ericsson
- 10.1.3. Intrado
- 10.1.4. MapInfo
- 10.1.5. Nokia
- 10.1.6. Openwave
- 10.1.7. Siemens
- 10.1.8. TCS
- 10.2. Future of location technology and services
 - 10.2.1. Automatic presence detection and positioning
 - 10.2.2. Presence and location-aware applications
 - 10.2.3. Everything is geo-coded
 - 10.2.4. End-user services customization