UBGI Practices in Korea

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Ubiquitous Sensor Network

- Ubiquitous: Everywhere, everything with tag and sensor nodes
- Sensor: Sensing ID and environmental information
- Network: Real-time monitoring and controlling via networks (wireless)

SCM
- Military
- Agricultural Management
- Port/Ship Management
- Supply Chain/Cold Chain Mgmt.

Mother Nature
- Surveillance
- Pollution Surveillance
- Smart Home
- Structural Health Monitoring

UBGI Middleware

USN M/W

USN Application Services
- Facility Management
- Environmental Monitoring
- Traffic Monitoring

UBGI Sensor Web Client

USN Application Services
- U-Health
- Smart Home
UBGI Applications

Real-time Odor Monitoring System

- odor monitoring and air-sampling systems
- meteorological observation systems
- sensor network for measuring density of sulfuretted hydrogen and carbon dioxide in the air
- meteorological observation servers
- CDMA wireless communication networks
- ethernet
- real-time periodic data collection
- analysis of the effects of the odor intensity
- real-time monitoring
- automatic air-sampling and sending message
- follow-up pollution source
- administrative guidance

- real-time monitoring

UBGI Applications

Environmental Monitoring System

- Node description
  - ETRI nano-qplus 1.5, 1e
  - IEEE 802.15.4
  - low-power tree routing
  - 2.4 GHz ZigBee

- Monitoring System Features

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<th>#</th>
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<td>Sulfuretted hydrogen</td>
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UBGI Applications

### Environmental Monitoring System

- **UBGI Applications**
  - **Environmental Monitoring System**

#### Integrated Control Center
- Gateway
- Sensor Node
- SN Interface
- SN Monitoring
- SN Data Process
- SN Info Archive
- Context Modeling
- Event Process
- SN Integration
- Services

- **CDMA**
- **Environ. Sensor:** Temperature, Ozone, Dust, Vibration, Tilt
- **Water/Sewage Status**
- **Residence Area**
- **Environment Info.**
- **U. S. Network**
- **Weather & Ozone Forecast**
- **Urban Environment Management**
- **Urban Facilities Management**
- **Urban Facility/Environment Management**
- **GIS Positions**

#### Water/Sewage Remote Management
- **Water Pressure**
- **Water Level**

#### Urban Environment Management with Road Lamp Poles
- **Vibration, Tilting**

#### Remote Management
- **Urban Environment Management**
- **with Road Lamp Poles**

#### Urban Facility/Environment Management

- **Integrated Control Center**
**UBGI Applications**

### Surveillance Reconnaissance

- Smart Sensor Node with Smart Antenna
- High Reliable Ultra Lightweight OS
- Anti-Jamming Capability
- Low-power and Small size SOC
- Energy and Bandwidth Efficient, Reliable and Secure Sensor Network
- Interoperability with Military Tactical Communication Network
- Detection, Classification and Tracking of Various Targets

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### Telematics Applications

- Sensor nodes & Wireless Sensor Network
- Context-Awareness about the road and intersection information
- Testbed Development : Network (CDMA, WiBRO, etc.) + VMS + Telematics Devices
UBGI Applications

Telematics Applications

- TSP (Telematics Service Provider)
- Base Station
- Mobile Device
- Road Information
- Intersection Context-Awareness
- Sensor Node
- Intersection
- Base Station
- Wireless N/W
- Wired N/W
- Broad Band
- Wireless N/W
- IEEE802.15.4

USN + Telematics = u-Traffic

UBGI Applications

Smart Building Management

- Smart Building Management
1. Detecting danger and blowing a whistle
2. Sampling sound and transmitting sample data (Estimating through FFT calculation and Pattern recognition of the sample data)
3. The sensed danger message is sent to the collecting node (u-Gateway Sensor Node)
4. The Monitoring system receives the sensed danger sense message and transmits an alarm message to the system
5. Displaying the sensed danger message on the LCD monitor
UBGI Applications

Industrial Fields Monitoring & Control

1. Regularly transmitting sensor data to monitoring server (current and temperature of motors)
2. Regularly transmitting sensor data to monitoring server (the status of the pull cord switch)
3. Regularly transmitting sensor data to monitoring server (air temperature)
4. Regularly transmitting sensor data to monitoring server (fire detection)
5. Displaying the sensor data
6. Displaying the sensor data
7. In case of emergency, wailing alarm (siren)
8. In case of emergency, controlling motors accordingly

Thank You!