Smart On-Street Parking Assistance System

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**Context**
- Traffic congestion ← cars looking for parking
- Several drivers chasing the same place (conflict)
- Informations missing or outdated (reliability)

**Problems:**
- Traffic congestion ← cars looking for parking
- Smart parking app - information broadcast → several drivers chasing the same place (conflict)
- Informations missing or outdated (reliability)

**Objectives:**
- Real-time and energy-efficiency WSN
- Parking assistance system based on distributed parking selection model
- Integration of crowdsourcing with the system to improve the information quality

**Service**
- Navigation

**Guidance**
- Information update
  - Parking availability (empty slot detection)
  - Parking occupancy

**Diffusion**

**Statistics**
- Occupancy rate
- Management

**Alert**
- Illegal parking
- Low battery status
- Component failure
- System abnormality
- etc

**Information dissemination**

**Real-time WSN**
- Measuring real-time information
- Battery-powered (energy constraint)
- Impact from urban environment (packet loss)
- Network performance (delay constraint) << 60s
- Sensor coverage (node density and sensing tech.)
- Traffic variation (vehicles’ arrival and departure)

**Guidance**

**Diffusion**

**Statistics**

**Alert**

**Energy-delay tradeoff in WSN**

- Threshold for distant and local drivers
- Crowdsourced information
- Direct com. (vehicle - GW/server)
- Information augmentation (for drivers)
  - Add the info of parking places into the packet
- Data aggregation
- Information delivery geolocalized
  - Distant drivers: statistics (time, destination)
  - Local drivers: available parking places
- Crowd sourced information