CSI 9851 자식기반 시스템 응용
(상황인지 시스템 및 서비스)

2011년도 제 1학기
강의진 소개

담당 교수
- 조성배 (공대 C515; ☏ 2123-2720; sbcho@cs.yonsei.ac.kr)

웹 페이지: http://sclab.yonsei.ac.kr/courses/11contexts

강의 시간
- 월 6, 7, 수 2 (공대A646)

면담 시간
- 수 9, 10

담당 조교
- 이영설, 윤종원
Mobile Device (Digital Device with Mobility)

SenseWear

DejaView

Microsoft SenseCAM
Improvement of Mobile Devices
(Advent of Smartphones)
Logging Your Life with Mobile Devices

- Physical Sensors
  - Location (GPS, Indoor GPS, Active Badge, RFID)
  - Temperature, Humidity, Acceleration, Touch, Illumination
  - Body sensors
  - Vision (Camera) / Sound
  - Bluetooth (Proximity Sensor)

- Device Usage
  - Application usage, User profile, PIMS data, Scheduler, E-mail, Address book

- Device Status
  - Battery/CPU/Memory Level

- UCC (User-Created Contents)
  - Photo, Video, Audio Clip
Personal Databases

[Images and illustrations related to personal databases, including maps, diagrams, and icons representing various features and functionalities of personal database systems.]
Mobile Intelligence: Overview

- Log collection/empty tools
- Landmark extraction engine

GPS
Call
SMS
Image
MP3
Device

Log collection
Mining
Modeling
Semantic expression
Episodic memory
Information generation search
Information management

Context-aware service
Query by memory fraction

Device inference engine
- Mobile modeling library
- Mobile reasoning engine
- Avatar creation/authoring tool

- Landmark extraction engine
- Mobile modeling library
- Mobile reasoning engine
- Avatar creation/authoring tool
Related Works

- Helsinki University, ContextPhone
- Microsoft Research, MyLifeBits
- Microsoft Research, MemoryLens (PhotoViewer, LifeBrowser)
- Microsoft Research, JamBayes
- Carnegie Mellon University, Context-aware Phone
- MIT Ambient Intelligence Group, PhotoWhere
- MIT Reality Mining Group, Serendipity Service
- MIT Reality Mining Group, Interactive Automatically Generated Diary
- ATR, ComicDiary
- NOKIA, LifeBlog
- SK Telecom, 1mm Service
- ...
Relevant Research using Mobile Device (LifeLogging)

On The Record, All the Time
Researchers digitally capture the daily flow of life.
By SCOTT CARLSON

The day I came home with a digital audio recorder hanging from my neck, a sign that said "Warning: This conversation may be recorded" that conveyed deep embarrassment. Then she said: "Have you heard about those people who are always recording everything?"

On the train to work, my fellow commuters did double takes to me, then got up and moved to another seat. One woman said: "Look, he’s recording." Another fellow told me that someone had given him a severe look through the train at the next stop.
Relevant Research using Mobile Device (User Adaptive Service)
과목의 최종 목표

모바일 장비로부터 얻어진 로그정보의 해석과 서비스제공을 위한 지식기반 시스템 기술 학습 및 상황인지 시스템 구현실습을 통한 실기 능력습득

지식 기반 시스템 기술 학습
- 지식 표현, 습득, 관리, 공유
- Data Mining, Probabilistic Modeling, Ontology

실제 상황인지 시스템의 구현실습
- 로그 정보의 획득, 전처리, 해석, 모델링, 시각화, 서비스 개발
강의계획

1. 3/2 : 과목소개
2. 3/7, 9 : 상황인지 개요 (상황인지 기술 동향)
3. 3/14, 16 : 상황인지 기반 감성시스템 동향 (보강)
4. 3/21, 23 : 상황인지 기반 감성서비스 동향
5. 3/28, 30 : Mobile context-aware framework
6. 4/4, 6 : Location awareness
7. 4/11, 13 : Activity awareness
8. 4/18, 20 : 제안서 발표, 중간시험기간
9. 4/25, 27 : 중간시험기간, Social contexts
10. 5/2, 4 : Recommendation
11. 5/9, 11 : Battery awareness-1
12. 5/16, 18 : Battery awareness-2
13. 5/23, 25 : Battery awareness-3 (보강)
14. 5/30, 6/1 : Battery awareness-4
15. 6/8, 13 : 최종발표
16. 6/15, 20 : 기말시험기간
## Course Schedule

<table>
<thead>
<tr>
<th>주수</th>
<th>강의</th>
<th>관련 자료</th>
</tr>
</thead>
<tbody>
<tr>
<td>1주</td>
<td>과목소개</td>
<td>-</td>
</tr>
<tr>
<td>2주</td>
<td>상황인지 개요</td>
<td>-</td>
</tr>
<tr>
<td>3주</td>
<td>상황인지기반 감성시스템 동향</td>
<td>-</td>
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<tr>
<td>4주</td>
<td>상황인지기반 감성서비스 동향</td>
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<tr>
<td>11주</td>
<td>Battery awareness 1</td>
<td>(에너지 관리를 위한 프레임워크)</td>
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<tr>
<td>Week</td>
<td>Issue</td>
<td>Related Literature</td>
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</tr>
<tr>
<td>15</td>
<td>최종 발표</td>
<td>-</td>
</tr>
<tr>
<td>16</td>
<td>기말 시험 기간</td>
<td>-</td>
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Evaluation Criteria

- Term Project (written report & oral presentation) : 60%
- Course Report : 10%
- Course Presentation : 30%

Term Project (Oral presentation is required) :
- Theoretical Issue (analysis, experiment, simulation) : Originality
- Interesting Programming (Game, Demo, etc) : Performance
- Survey : Completeness
Mobile Context Applications

Context Sharing (Photo, Location)

Mobile Visualization

Mobile Context-Aware System

Place Annotation
Possible Project List

- Battery-awareness for energy efficiency
  - Swapping Wi-Fi, GPS, and Cell for energy efficient location awareness
  - Battery aware sensor / service selection
  - Predicting battery recharge depending on battery usage and context
  - Development of context middleware for energy efficiency
  - User state recognition considering sensor on/off

- Context-aware recommendation
  - Application recommendation depending on mobile context
  - Recommendation based on local contexts
  - Predicting & recommending user activities
  - Social context-based recommendation
  - Using combinations of two or more contexts for recommendation