

Security Management in the Internet Era

14th: Final Presentation (1)
January 12, 2012

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Schedule

01st (09/22) Course Description
02nd (09/29) Cloud Security (1)
03rd (10/06) Cloud Security (2)
04th (10/13) Military use of the cyber security technology and its issues
05th (10/20) IPv6 Security
06th (10/27) Guest Lecture (Joichi Ito)
07th (10/27) Personal Information and Security (1)
08th (11/10) Personal Information and Security (2)
09th (11/17) Evaluation of Security Risk
10th (12/01) Guest Lecture
11th (12/08) Guest Lecture
12th (12/15) Midterm Presentation (1)
13th (12/22) Midterm Presentation (2)
14th (1/12) Final Presentation (1)
15th (1/19) Final Presentation (2)

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Final Assignment

Please identify the issues to be resolved in our society and How CPS(Cyber- Physical Systems) can be utilized to solve the problems.

Furthermore, by utilizing this system, make clear case for new problems.

Answer should consider the following points.

- Technology
- System
- Education
- Promotion of taking risk while proceeding it

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Supplementary Note

- Slides in English and Presentation in English
- 20-minute presentation each team
- 15-minute question and answer

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Presentation schedule

- 12 Jan. Final Presentation
 - Group 1 and 2
- 19 Jan. Final Presentation
 - Group 3 and 4

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Group 1

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Cross-platform Human Tracking For "Mimamori"

Midterm Presentation
Group 1

- Noriyuki Suzuki, Fall Doudou (NAIST), Toshiaki Hatano, Shinya Hiruta (SFC),
 - Dan Sawada (MIT)

Background

For safety reasons, there are many demands toward keeping track of the whereabouts of children and the elderly.



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Our Proposal

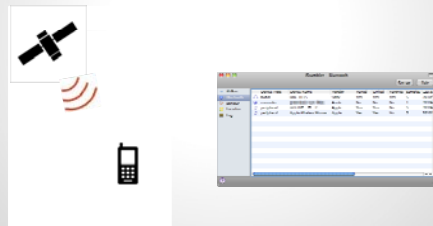
Provide detailed presence history and tracking data of a "child" or "elderly" to their guardians.

Propose a standardized protocol and integrate presence data from various data collectors.

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Existing Human Presence Tracking

- Telecommunication
 - GPS Data From Mobile Devices
 - Wi-Fi Access Points



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Existing Human Presence Tracking

- Finance / Commerce
 - Credit Card Usage
 - IC Wallet Usage
- Transportation
 - IC Pass → Track Origin & Destination



2011/11/11, From: **Shin-Osaka** 12:00, To: **Tokyo** 14:30
2011/11/12, From: **Tokyo** 14:40, To: **Akabane** 15:00

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Existing Human Presence Tracking

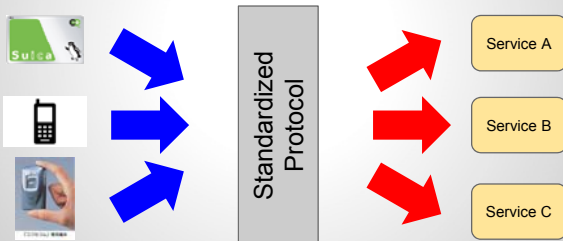
- Public Safety
 - Surveillance Camera (Facial Recognition)
- Web Service
 - Four Square / Facebook / Twitter



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Cross-platform Data Collection

- Presence Data by Wide Variety of Service Providers
- Data structure defined by standardized protocol



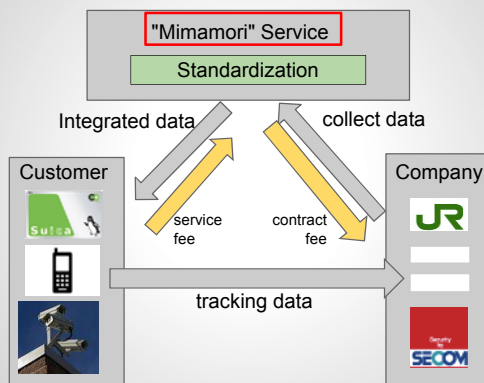
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Issues

- Privacy Protection
 - Who would be responsible for any data leakage or misuse of data?
- Public Acceptance
 - How would the services be acceptable to the public, in terms of integrating various information?

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Services



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Proposed "Mimamori" Service

- The service itself would not use the information beyond providing clients with tracking information
- Takes all the responsibility for data leakage.
- Would charge the customer for service

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Data Collectors

- Provide presence data to external services, only at the users' permission and will.
- Not everyone's data would be provided.
- Since it is the user's will to provide information to external services, they would not be responsible if any leakage happens at the external service.

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Customer

- Sign contract with our proposed service, for not disclosing information, and also pay a fee for maintaining the system.
- Would be able to gain extremely detailed information of where their child is at, and what they are doing.

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Challenges Upon Service Launch

- Agreement between the user and data collector (e.g. cell phone provider) must be changed
 - Cell phone provider may disclose information to third party at the users' will and permission
- Fee charge
 - Must consider a reasonable pricing for all the stake holders.

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Conclusion

- Proposed a cross-platform human tracking service for "mimamori", which provide users with detailed activity history of their child and etc
- Gather information from various data collectors in a standardized format
- Integration of presence data would only be done at the users' will and permission

Group2

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Final Presentation
Jan 12, 2012

CPS for Artificial Environment

Group 2: Ega Dioni PUTRI, Hirotaka NAKAJIMA,
Yoshimasa OBANA, MIGUEL Patiño González

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Contents

- 1 Review of Mid-Term Presentation
- 2 Existing Works
- 3 System Goals
- 4 Constraint and Solution
- 5 Planning

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Review of Mid-Term Presentation

■ Idea

CPS for better supervising in environment made by human, especially agriculture / aquaculture area

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@ Review of Mid-Term Presentation

- Characteristics
 - Integration and comprehensive result
 - enabling monitoring tools for environment quality parameters are connected each other
 - Scalability
 - collecting report and delivering solution through devices in physical system regardless area width
 - Timeliness (timely convenience) history
 - storing and processing land daily-supervision records
 - Knowledge sharing
 - expert to non-expert either in physical or cyber world

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@ Review of Mid-Term Presentation

Physical space

Cyber space

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@ Existing Work #1: AEON-Fujitsu

- AEON – Fujitsu Farming Know-How Database

A database of techniques and methods used by successful farmers to cultivate crops

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@ Existing Work #2: Hitachi

- "GeoMation Farm" Agriculture Information Management System

- Energy savings
- Optimizing chemical use
- Making effective use of resources

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@ Existing Work #3: Smart Vineyard

- "GranMonte Smart Vineyard" Precision Farming System

- Monitoring using sensors
- Data recording and Analysis
- Information available via Website

http://www.smartfarmthailand.com/granmonte/Micro_Climate_Station.htm

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@ System Goals

- Industry
 - Control volume of food by using demand forecasting that enables
 - Stable supply of foods
 - Price stabilization
 - Reduce amount of disposed foods
- Environment
 - Monitoring
 - Inside: Temperature, Humidity, Hours of sunlight.
 - Outside: Weather
 - Management
 - Make changes on environment (temperature, humidity, light, CO² level) and also soil (pH level, moisture) based on monitored environment information

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@ System Goals

Homogenized environment

- Improvement of farm technology requires lots of trials to test
- Utilize following technologies
 - Monitoring
 - Controlling
- Homogenized environment can be a massive

Human

- Applying Environment Management and TestBed**
 - Reduce volume of agrichemicals
 - Organic vegetable
 - Environment preservation
 - Reduce usage of energy
 - Productivity improvement
 - No hidden know-how
 - Standardized agricultural work

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@ Constraint #1: Time Delay

Deployment and improvement system performed simultaneously with study in agriculture field needs a long time for implementation

- Solution proposed**
 - Improve management cycles
 - Control more precisely the production stages in different geographic areas
 - Implement corrective actions in areas where the ideal conditions have not been achieved
 - Irrigate areas where there was not enough rain, etc.

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@ Constraint #2: Gap among Places

Deployment is physically limited because physical field with equal condition are very limited. Research area is type of experimental issue that should consider the facts.

Agriculture in North America, Europe is very computerized, but not in the emerging area such Africa, China, Middle eastern, India, etc. They are not using the same way for agriculture.

- Solution proposed**
 - It is difficult to standardize monitoring tools
 - Might require large investment
 - Inputs should be adjusted for different environments
 - Levels considered appropriate for a region

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@ Constraint #2: Gap among Places (Sample: Japan)

- Artificial Environment in Japan has to be well controlled because the following things:
 - High land cost
 - High labor cost
 - Luxury brand
 - Recording is required to get certificate

1 st year Paddy	1 st year Paddy
2 nd year Idle	2 nd year Paddy
3 rd year Bawn	3 rd year Paddy
4 th year Idle	4 th year Bean
Australia	Japan

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@ Constraint #3: Parameterization

Parameterizing of attribute is still unknown, while business as single entity can be larger. Company can make experiment to get the input. Existing works mainly in agriculture and aquaculture about parameterizing of the field.

- Solution proposed**
 - Parameter should be bounded in ideal range of environment quality according to organism therein
 - Standard value should be set by expert based on years of experience

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@ Planning

- Matrix of Functionality Achievement**

Functionality	Planned within 3 months	Planned within 6 months	Planned within 1 year
Read the value reported by sensors	Yes		
Operate sensors remotely		Yes	
Build the sensor network			Yes
Set up the standard on sensors remotely		Yes	
Store periodical monitoring history	Yes		
Send the necessary information to on-site workers' device	Yes		
Create statistic from field work history for certain period			Yes
Formalize expert knowledge			Yes
Installation			Yes

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Mid-Term Presentation
Dec 15, 2011

Comments and Questions are Welcome!

Thank You

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