Ubiquitous Networking

MORIKAWA
LABORATORY

Hiroyuki Morikawa

The University of Tokyo
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Ubiquitous Network Projects

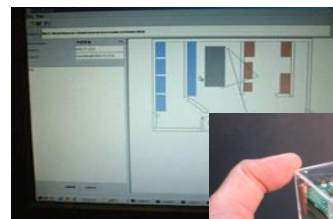| 2001	2002	2003	2004	2005	2006	2007	2008

Report of
"Ubiquitous Networking"
was issued

MPHPT committee
started the study of
"Ubiquitous network"

Forum {
"Ubiquitous network forum"

"Network robot forum"

First funds granted by government 23mil US $ / year

Ubiquitous network project

RFID project

Network robot project

Sensor network project

Ubila project
Started
(Sept. 2003)

Testbed

Joint field trials

JGN network   JGN II network

STONE Room 2000-2004

Indoor Positioning Systen

Positioning Server

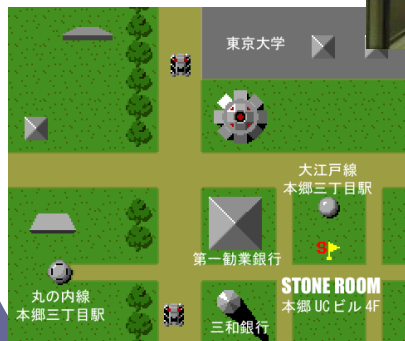Sensor Control Hardware

U. Tokyo
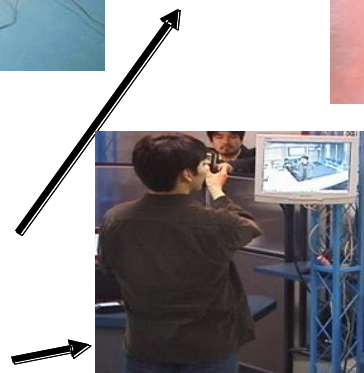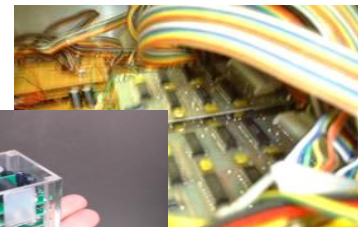
Keio U.

Internet

Mobile Video Conference

"ConnectTo Service"

Service Resolvers

Universal Remote Controller

Akihabara Ubiquitous Network Testbed

- Research Theme
  - Context extraction mechanism from sensor rich space
  - From context information to personalized service
  - Low-power wireless service/device discovery
  - Demonstration in Akihabara area
- Technology
  - Signal processing and learning mechanism for context extraction, context modeling and description
  - Sensor data mining, sensor web service
  - Low power tiny sensor node (wakeup on wireless, OS, CPU…)
- Application
  - Earthquake monitoring, structural monitoring, disaster contingency planning, risk management, elder care, profiling business, ADL (activities of daily living) modeling
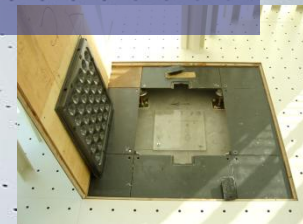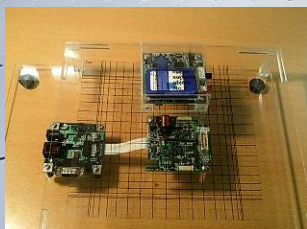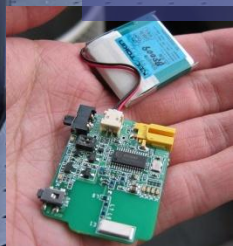
Komaba Mlab Laboratory

Motivation

- *Data sharing*
  - Proliferation of smart sensors, networks and systems without standards will make data sharing hard

- *Platform sharing*
  - Scarcity of real, physical platforms makes it hard to test different algorithms

Risk Notification Service

Community Support Service

Metabolic Assistance

コンテキストアウェアアサービス群

Marshup context for application

Store a variety of contexts on distributed database

Extract context from sensors, service usage pattern, user profile…

マッシュアッププレーン

Mashup Engine

コンテキストネットワーク

Open distributed database

コンテキスト抽出プラットフォーム

Context extraction plugin

Objectives

- Maximize the use of test beds

- Maximize the use of data
  - Sharing data requires global standards

- Exploit research synergies
  - Pool of interdisciplinary researchers is small

Green Network Architecture

Home · Office · Mobile · Industry

Contextual and Spatio-temporal Dependency of Human and Machine Activities

Modification and Architectural Change

Application Layer Protocols, Naming System, Service Discovery Protocols, Routing Protocols, TCP/IP, MAC Protocols

Performance Control

Monitoring Technology

Energy Consumption Monitoring

Access Networks and Backbone Networks, Servers, Terminals