Information-Centric Design of Context-Aware Systems
Using Information Technology to Improve the Quality of Life

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What is this Course About

Improving the quality of life using information technology
Participants

- UMD
  - 23 registered
  - ...

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Topics to be Covered

• Information Dynamics
• Context and Context Aware Computing
• Location – Determination and Use
• Activity Recognition
• Context Modeling and Reasoning
• Learning from Context
• Context-Aware Systems and Middleware
• Proactive Computing
• Other issues – Security, Privacy,…
Workload

• Class Presentation and Write-up
  – Will assign a topic for each class and each student has to pick a topic, present and prepare a 4-5 page summary write up to be distributed to the class before presentation

• Class participation and discussions

• Project

• Midterm

• Final
Project

• Teams of 2-3
• Build Context-Aware Application on Rover
• Regular updates to be provided in class
• Significant part of the grade.
Methodology

• Lectures
  – Focused presentation on a topic
    • Slides posted on the web
    • Writeup to be distributed before presentation.
      – Annotate by adding your notes to catch the major points that may come up in discussions after the presentation.

• Proof of Concept Demonstrations/Projects
  • ROVER II
Grading

• Based on
  – Class participation
  – Weekly activities
  – Papers/Presentations/ Projects
  – Exams
Interactions

- In Class
- Through “Piazza”
- Papers
- Web postings
- Individualized
- ...

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Rover

Service Interface (to service tier)

Core

Context Storage

Context Engine

Activity Manager

Activity Store

Learning and Reasoning Engine

User Models

Logs Storage

Client Interface (to interface tier)

UI Console

Template Storage

Template Manager

Controller

Client agent application

Client application
Quality of Life

• What does it mean to you?
Perspective

• Individual
  – Family
  – Social Groups
  – Friends Circle
  – ...

• Organization
  – International - UN
  – Corporation
  – Government
  – Non-profit
Areas

- **Security**
  - Public Safety – Individual
  - First Response – Incidence
  - Emergency Response – Catastrophic events

- **Education**
  - Elementary
  - School
  - College
  - Post Graduate and Research

- **Health Care**
  - Physician
  - Hospital
  - ER
  - Wellness care – health clubs – exercise
  - Food and Nutrition

- **Recreation**
- **Social Interactions**
- **Transportation**
- **E-commerce**
- **Finance**
- **Web**
Some Basic Notions

• Information
  – Fundamental Nature
  – Implications
• Interrelationships
• Context
• Models
• Limitations of Physical representations of information
Technological aspects

- Processing
- Storage
- Human Interaction
- Communications

- Inputs
  - Sensors
- Outputs
  - Actuations
  - Commands
  - Messages
When reading a paper

Standard paper questions:
- What is the claim of the paper?
- What is the key idea of the paper?
- What are the strengths and weaknesses of the paper?

Information-Centric questions:
- What is the purpose of the ‘information’ they are capturing?
- What ‘information’ are they capturing?
- How are they capturing the ‘information’?
- How are they storing the ‘information’?
- What ‘contextual information’ are they capturing?
- Is the ‘information’ being captured sufficient or useful for the purpose?
- What additional ‘information’ could or should be captured?