CIS 8070: Pervasive Healthcare Technologies

Prerequisites:
None

Catalog Description:
This course provides an in-depth coverage of issues in ubiquitous and pervasive information systems. This will include the current and emerging applications, wireless and mobile infrastructure, devices, middleware, and network access issues.

Detailed Course Description:
The any-time any-where access to information has led to some advances in ubiquitous and pervasive information systems. This includes design and implementation of new applications such as personalized and context aware applications, location-based applications, multi-party interactive games, content and entertainment services, pervasive healthcare, and data-centric applications. Issues and challenges related to wireless and mobile infrastructure for UPIS, interworking among multiple networks, and short-range wireless networks such as bluetooth and IEEE 802.11 wireless LANs will be included. As hand-held devices will be used to access many of the UPIS applications, devices issues (memory, power and battery restrictions, current and future applications and software development) will also be discussed. The middleware (the layer of software which hides networking details from applications) issues, challenges, and available solutions including wireless applications protocol (WAP), network access, security and related management issues will also be included.

Text:
1. *Ubiquitous and Pervasive Information Systems*, by Upkar Varshney
2. Slides and papers available from course website (http://www.cis.gsu.edu/~uvarshne/)

Useful References:
1. “Issues in Pervasive and Ubiquitous Information Systems”, Kalle Lyttiyen and others, Communications of the AIS
4. Several articles from Communications of the ACM, IEEE Computer, International Journal on Mobile Communications, Communications of the AIS, and from several conferences with very readable proceedings (available with GSU IEEE and ACM access and from other sources).
Course Objectives:

After completing this course successfully, a student should have:

- An in-depth knowledge of ubiquitous and pervasive information systems
- A high-level understanding of UPIS applications and their usage scenarios
- An understanding of multiple networking technologies to be used in UPIS environment
- The skills to identify and design the infrastructure-support for ubiquitous and pervasive information systems
- An in-depth knowledge of devices and middleware challenges in UPIS environment
- A high-level knowledge of network and quality of service management
- Skills to derive security and data-access requirements of different UPIS applications
- An understanding of multiple factors in offering, adoption and usage of UPIS services
- An awareness of emerging trends and development in UPIS

Lecture Plan (subject to change as needed)

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Topics</th>
<th>Readings</th>
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<tbody>
<tr>
<td>1</td>
<td>Introduction to ubiquitous and pervasive information systems</td>
<td>Ch. 1, paper 1</td>
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<td>2</td>
<td>The need, applications and solutions for today’s wireless organization</td>
<td>Ch. 2, paper 1</td>
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<td>3</td>
<td>Current and emerging UPIS applications Part I:</td>
<td>Ch.3, paper 3</td>
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<td></td>
<td>(personalized and context aware applications, location-based applications, multi-party interactive games)</td>
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<td>4</td>
<td>Current and emerging UPIS applications Part II:</td>
<td>Ch.3, paper 3</td>
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<td>(content and entertainment services, pervasive healthcare, data-centric applications, mobile commerce applications)</td>
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<td>5</td>
<td>Wireless and mobile infrastructure for UPIS, inter-working among multiple networks</td>
<td>Ch.4</td>
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<td>6</td>
<td>Short range wireless networks such as bluetooth and IEEE 802.11 wireless LANs</td>
<td>Ch.5</td>
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<td>Mid-Term</td>
<td>Mid-term exam</td>
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<td>8</td>
<td>Devices issues (memory, power and battery restrictions, current and future applications and software development)</td>
<td>Ch.6, paper 1</td>
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<tr>
<td>9</td>
<td>Middleware issues (WAP and other middleware, building applications using available middleware)</td>
<td>Ch.6, paper 1</td>
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<td>10</td>
<td>Network access architectures</td>
<td>Ch.7, paper 2</td>
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11 Quality of Service (end-to-end performance, inter-working applications) | Ch.7, paper 2
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12 Security, content management | Ch.8, paper 2
13 Data-access and management | Ch.9, paper 2
14 Applications and content providers, pricing and cost of implementation, management of UPIS services | Ch.10
15 Additional issues in UPIS (future, regulatory and complexity) | Ch.11
Final Exam

**Attendance & Class Participation:**

You are expected to attend the class regularly. My experience has always been that students learn the most when they come to the class everyday and interact with the instructor and other students. 5% of your grade will be based on class participation.

**3 factors leading to a higher score**

- Positive attitude in the class
- Advance reading of the material to be covered in the class
- Attentiveness in the class to learn new material

**3 factors leading to a lower score**

- Unjustified and frequent absences from the class
- Disruptive behavior (including talking to other students during a lecture)
- Cheating

**Grading:** the following point allocation will be used:

- Quiz 1: 40 points (10%)
- Mid-term Exam: 100 points (25%)
- Quiz 2: 40 points (10%)
- Final Exam: 100 points (25%)
- Reports/Assignments/Projects: 100 points (25%)
- Class participation: 20 points (5%)

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Total 400 points (100%)

**Late Work:**

Assignments must be turned in at the beginning of class on the date due. Each additional working day will cause a 25% reduction of grade as the late penalty.
Assignments:

1. All assignments are to be typed, carefully written and edited.
2. All assignments must be stapled in the upper left-hand corner.
3. All assignments must reflect your individual efforts only. Any copying, cheating, or plagiarism will not be tolerated. The departmental and college policies for cheating will be followed for anyone caught in such offenses.
4. Assignments will be graded for form as well as content.
5. Errors in spelling, grammar, or syntax can detract from or distort the message you are trying to communicate. As a result, such errors may reduce your grade.

Behavior in the Class:

1. Any disruptive behavior in the class will lead to a reduction in class participation points.
2. I love to answer questions, but if you have lots of questions due to previously missed lectures or other reasons, I suggest that you talk to me before or after the class.