
Operating Environments for Resource Management

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Spring 2.005

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Objectives

The main discussion is centered on the operating environment and how this environment can affect the application performance.

Other topics are: which services are more appropriate; in which way we have to offer the services to improve resource management.

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Contents

- The spectrum of computational and information devices is expanding dramatically.
- Tiny networked devices, embedded servers, planetary-scale services, smart spaces, and low-power wireless networks are emerging.
- We will explore a series of non-traditional systems areas that are critical to deeply networked systems of extreme devices: *the small, the large, and the numerous*.

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Contents

- Pervasive computing:
 - *Smartphone, sensor networks, other wireless approaches.*
 - *April.*
- Resource management in SMP's & clusters:
 - CPU, Memory, I/O.
 - May.

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Methodology

- In-class paper presentation(s)
 - Class participation, picking selected papers, and discussing aspects from these papers with other class members.
- Final project. The project involves:
 - Writing a brief proposal describing the project and what you expect to achieve.
 - Implementing the details described in the proposal.
 - Writing a report.
 - Presenting your project to the class.

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Final presentation

- Purpose of project/study including related work.
- Expected outcome/results.
- Conclusion, stating the main results from your work.
 - Performance evaluation.
 - Proposals to do next.
- Its usefulness in the context of other work AND in the context of general research.

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Grading

Class participation: 50%

Final project: 50%

4-6 pages report (to present before the 10th May)

Presentation the 1st and 6th June.

Same format as the papers we will read and discuss in the course.

The best papers will be selected as candidates for potential conference papers

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General notes

- Mostly practical course.
 - Few new concepts.
- Participation oriented.
 - Everyone should read all the papers discussed in class.
 - A good presentation involves a clear and accurate description of all the key points in the paper(s).
 - You should take an appropriate amount of time to read papers and prepare your presentations before class.

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But

We are too many people to meet all together !

- One subgroup meets on Monday.
- One subgroup meets on Wednesday.

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On Monday

- Miguel Alejandre
- Javier Alonso
- Jairo Balart
- Daniel Bassas
- Miguel Colomer
- Isaac Gelado
- Sergio Gomez

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On Wednesday

- Juan Gonzalez
- German M. Llorca
- Roberto A. Morales
- Ramon Nou
- Ramshankar Ramanarayanan
- David Rodenas
- Salvador Salanova

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What do we say by “pervasive” computing

- Topics include:
 - tiny connected devices and operating systems, wearables, embedded servers, low-power networks, sustainable power harvesting, sensor networks, tiny IP stacks, directed diffusion, address-free routing, global coordination through local actions, scalable discovery, smart spaces, vehicles and buildings, negotiation architectures, self-assembly, service composition, mobility, and scalable services.
- All them are possible projects if you want.

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Hardware support

- Sensor networks
 - RF communication based
 - Bluetooth communication based
- Smartphones (Symbian OS and Linux OS)
- PDAs (Windows Mobile OS and Linux OS)
- Etc, ...