Review Form: 1st International Workshop on
Services and Infrastructure for the Ubiquitous and Mobile Internet (SIUMI'05)

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WEB MINDS

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In conjunction with the 25th Int. Conference on Distributed Computing Systems (**ICDCS'05**)

Paper Number: 08
Paper Title: Framework and Rule-based Language for Facilitating Context-aware Computing using Information Appliances
Authors: K. Nishigaki, K. Yasumoto, N. Shibata, M. Ito, T. Higashino

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Reviewer1:

Familiarity Rate your familiarity with the topic	1	2	3 ✓	4	
	Novice	Some knowledge	Familiar	Expert	
Significance Technical relevance and practicality of ideas in the paper	1	2 ✓	3		
	Not significant	Somewhat significant	Highly significant		
Novelty How original the problem and/or solution method is	1	2 ✓	3		
	Not novel	Somewhat novel	Highly novel		
Quality of Presentation Writing and presentation style/accuracy	1	2	3✓		
	Poorly written	Could be improved	Well written		
Overall Recommendation	1	2	3	4✓	5
	Strong reject	Weak reject	Weak accept	Accept	Strong accept

Contributions

The paper proposes a rule-based middleware to support device personalization and to control context-aware application provisioning. The main goal of the proposed solution is to simplify the control of context-aware service provisioning. Authors propose a description language to specify control rules and focus on the issues of rule specification and rule conflict detection and resolution.

Strengths and weaknesses

The paper is well-written and presents a rule-based framework for the control of information appliance provisioning that seems quite solid and technically interesting. However, the research area that authors focus on, i.e., context-aware device personalization, has recently gained considerable interest and a lot of proposals are already available. Authors should outline with more strength the novelty of their proposal and the main differences with other related works. Some related works have been described, but some relevant close research works are missing, e.g., the Gaia framework.

Detailed public comments

Reviewer2:

Familiarity Rate your familiarity with the topic	1	2	X 3	4	
	Novice	Some knowledge	Familiar	Expert	
Significance Technical relevance and practicality of ideas in the paper	1	X 2	3		
	Not significant	Somewhat significant	Highly significant		
Novelty How original the problem and/or solution method is	1	X 2	3		
	Not novel	Somewhat novel	Highly novel		
Quality of Presentation Writing and presentation style/accuracy	1	2	X 3		
	Poorly written	Could be improved	Well written		
Overall Recommendation	1	2	X 3	4	5
	Strong reject	Weak reject	Weak accept	Accept	Strong accept

Contributions

The authors propose a rule-based, context-aware system for controlling appliances, and a mechanism for detecting and handling conflicts between rules. A prototype system is implemented. The subject is interesting, and the interfaces for describing contextual conditions are effective. However, the mechanism for conflict detection is rather weak, since it addresses only conflicts between rules that control the same appliance. Conflicts between rules controlling conflicting appliances (e.g., a heater and an air-conditioner) are not detected. Moreover, the system lacks an authentication layer, and seems adequate only to a home scenario.

Strengths and weaknesses

The prototype system provides an effective mechanism and interfaces for a user-friendly description of contextual conditions.
However, conflict detection is rather naive, addressing only conflicts between rules that control the same appliance. On the contrary, conflicts can happen between rules controlling nearby appliances that perform opposite tasks (e.g., a heater and an air-conditioner) or that share the same resource.
Moreover, the system lacks an authentication layer.

Detailed public comments

Conflicts can be introduced by rules that control different appliances, since different appliances can be incompatible (for instance, two appliances with audio output --a TV and a stereo-- cannot be on at the same time in the same room). These conflicts should be considered too, and could be handled proposing alternative rules, e.g., if the TV is already on in the living room, turn on the stereo in a different room. These complex relations between appliances could be properly described using ontologies, as proposed for example in “Organizing Ad Hoc Agents for Human-Agent Service Matching”, W. Pasman, MobiQuitous 2004.
An authentication mechanism would also improve the conflict resolution strategy. With no authentication there is no control on who declares the priorities and everybody can modify the priorities declared by another person.

Reviewer3:

Familiarity Rate your familiarity with the topic	1	2	3	**4**	
	Novice	Some knowledge	Familiar	**Expert**	
Significance Technical relevance and practicality of ideas in the paper	1	**2**	3		
	Not significant	**Somewhat significant**	Highly significant		
Novelty How original the problem and/or solution method is	1	**2**	3		
	Not novel	**Somewhat novel**	Highly novel		
Quality of Presentation Writing and presentation style/accuracy	1	2	**3**		
	Poorly written	Could be improved	**Well written**		
Overall Recommendation	1	2	**3**	4	5
	Strong reject	Weak reject	**Weak accept**	Accept	Strong accept

Contributions

The paper addresses the problem of configuring a home network of sensors according to user rules and resolving users conflicts. The paper is well written, well organized, a prototype is presented. The issue tackeled is a very relevant and important one. In my opinion however, the novelty of the work is quite limited: there are two main bodies of related work, which are not mentioned:
-the work on conflict resolution among configuration policies has been studied in areas such as requirement engineering, configuration management, document editing (distributed collaboration). None of these work is mentioned. It appears to me that there is a lot in common between your conflicts and language and the problems in these domains
-the work in context aware mobile computing including approaches such as Aura, Carisma, Context, etc. These should be mentioned and compared

Strengths and weaknesses

+well written
+complete paper with evaluation and prototype
-could be more novel
-missing comparison with relevant related work

Detailed public comments

The authors should make an effort and indicate the novelty with respect to existing approaches in the area of context aware middleware for mobile/pervasive computing. An indication on why you think your language is novel would be useful: is it just because it's applied to sensor/actuators?

More details about the conflict resolution should be given: it seems to me that your solution to conflict resolution is not particularly novel or difficult (assigning priorities seems straightforward). I did like the changing of the priorities in time though.