A Role-Based Implementation of Context-Dependent Communications Using Split Objects

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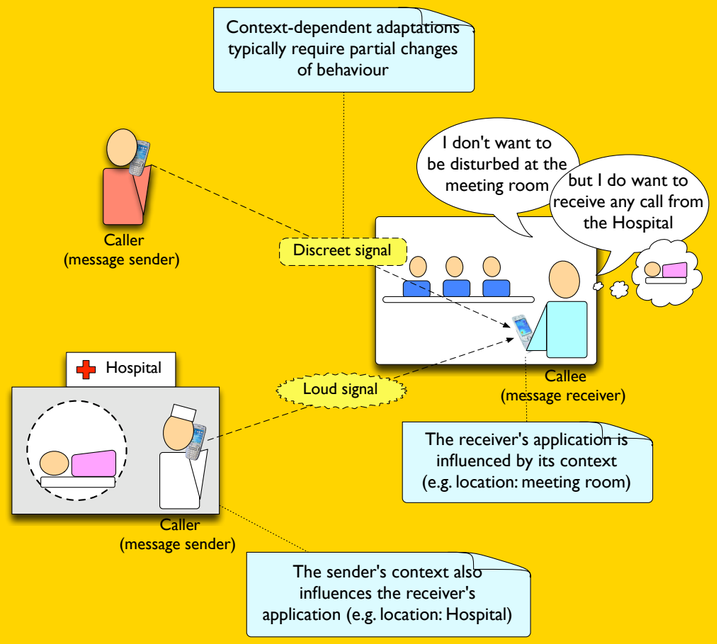
Motivation: Context-Dependent Communications in Pervasive Computing

Context may influence the communication between entities of a system



Problem Statement

R.1 Dynamic Context Adaptation

Context-aware applications should adapt to the context by dynamically switching their behaviour.

R.2 Dynamic Behaviour Composition

Context-aware applications should be based on composable parts representing partial adaptations of behaviour.

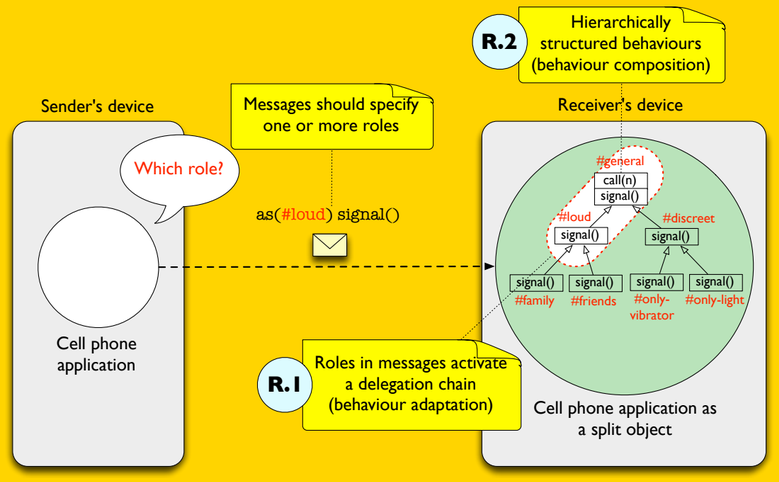
R.3 Context Passing Mechanism

Messages should include context information of the sender.

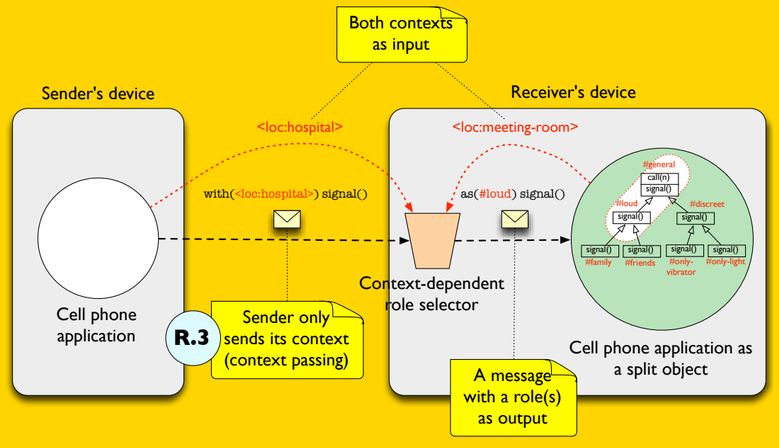
A Two-Fold Solution Based on Roles

Context-dependent behaviours as roles using Split Objects [2].

Roles represent the different behaviours an application can adopt according to the context.

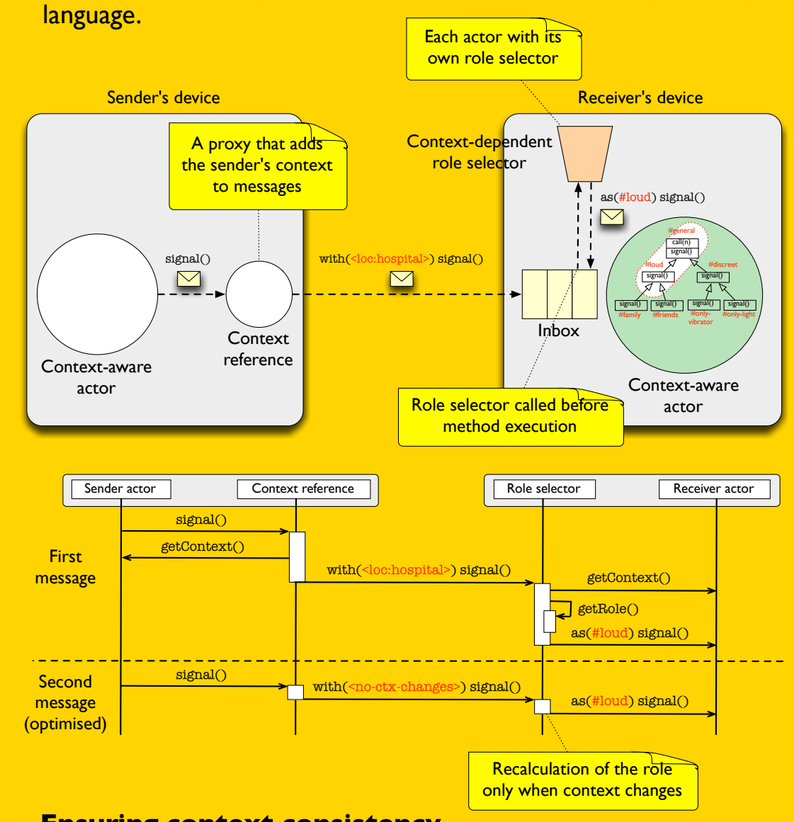


Context-dependent role selector: Mapping context information to a context-dependent role (rule-based engine).

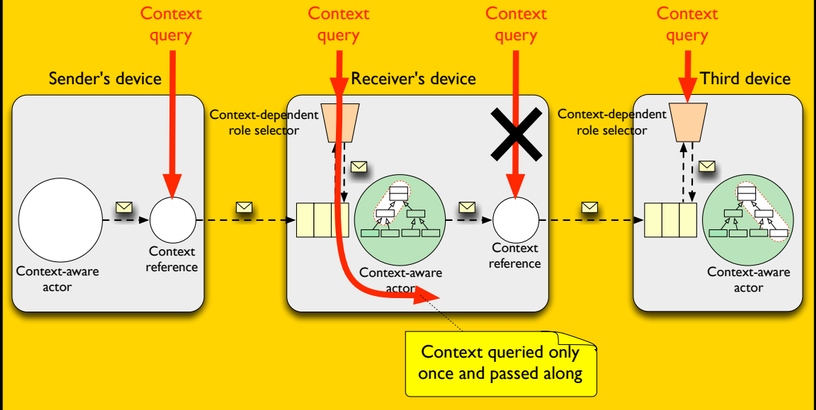


Implementation: Context-dependent roles in AmbientTalk

AmbientTalk [3]: a prototype- and actor-based programming language.



Ensuring context consistency



[1] A Role-Based Implementation of Context-Dependent Communications Using Split Objects. Vallejos, J., Ebraert, P., Desmet, B., RDL workshop, ECOOP '06. Nantes, France.

[2] Split objects: a disciplined use of delegation within objects. Bardou, D., Dony, C. ECOOP '03. Darmstad, Germany.

[3] Ambient-Oriented Programming in AmbientTalk. Dedecker, J., Van Cutsem, T., Mostinckx, S., D'Hondt, T., De Meuter, W. ECOOP '06. Nantes, France.

http://prog.vub.ac.be/amop