

# **CAMidO: A Middleware for component-based context-aware applications development**

## **(Extended Abstract)**

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Mobile devices are characterized by dynamism in their environment. Thus it becomes essential to create applications that adapt their behavior according to environmental changes. Most of research works dealing with context and adaptation focus their efforts either in proposing context models for context description (application developer has to deal with context and adaptation), or in proposing platforms that interact with context and adapt the application to context changes without providing any meta-model for context description. Our proposition CAMidO ( Context-aware Middleware based on an Ontology meta-model) provides both a meta-model for context description and context-aware components for context management and application adaptation.

The CAMidO meta-model is divided into three levels, an ontology, written in the OWL language, is associated to each level. The meta-model allows the description of all the following elements : context, sensors from which data are collected, interpretation rules and adaptation policies. The described data are used by the CAMidO compiler in order to generate adaptation source code and rule files for relevant context detection.

CAMidO handles two adaptation types, the reactive adaptation and the proactive adaptation. The reactive adaptation consists in triggering the appropriate adaptation operation when a relevant context is detected, whereas the proactive adaptation concerns component invocation behaviors. It consists in switching from one invoked operation to an other one. These adaptations are carried out by component containers to which new controllers were added.

CAMidO middleware is a component-based middleware which automates context management using context-aware components. These components use the meta-model and the generated rule files in order to collect context information, interpret high level of context data, analyze these data and detect their relevant changes in order to apply the appropriate adaptation.

We have implemented a prototype of CAMidO on top of OpenCCM, and we have evaluated the performance and the cost generated by the context management without considering the proactive adaptation. As a next step we intend to look further into the adaptation conflicts in order to resolve them using a consensus mechanism. We also intend to study the distribution of the CAMidO context-aware components and the cost induced by the proactive adaptation.