Abstract

Novel ubiquitous computing applications such as intelligent vehicles, smart buildings, and traffic management require special properties that traditional computing applications do not support, such as context-awareness, massive decentralisation, autonomous behaviour, adaptivity, proactivity, and innate collaboration. This paper presents a new computational model and middleware that reflect support for the required properties. The sentient object model is proposed by the CORTEX<sup>1</sup> project to support the construction of ubiquitous applications. A flexible, run-time reconfigurable component-based middleware has been built to provide run-time support to engineer the sentient object programming paradigm. An application infrastructure using sentient objects to enable cooperation between autonomous and proactive vehicles has been implemented to demonstrate the appropriateness of the computational model and the validity of the middleware for pervasive mobile ad hoc computing.